

3.3.4 Terrestrial Resources

The discussion of terrestrial resources is divided into five sections. The affected environment is discussed in Section 3.3.4.1, environmental effects of the Project are discussed in Section 3.3.4.2, cumulative effects are described in Section 3.3.4.3, proposed conditions are discussed in Section 3.3.4.4, and unavoidable adverse effects are addressed in Section 3.3.4.5.

Where existing, relevant and reasonably available information from the PAD was not sufficient to determine the potential effects of the Project on terrestrial resources, YCWA conducted nine studies: 1) Study 4.1, *Special-Status Wildlife – California Wildlife Habitat Relationships*; 2) Study 4.2, *Special-Status Wildlife – Bats*; 3) Study 5.1, *Special-Status Plants*; 4) Study 6.1, *Riparian Habitat Upstream of Englebright Reservoir*; 5) Study 6.2, *Riparian Habitat Downstream of Englebright Dam*; 6) Study 6.3, *Wetlands*; 7) Study 7.5, *CESA-Listed Plants*; 8) Study 7.6, *CESA-Listed and Fully Protected Wildlife – California Wildlife Habitat Relationships*; and 9) Study 7.7, *CESA-Listed and Fully Protected Wildlife – Bald Eagle*. With the exception of one study (6.1), the studies are complete, and technical memoranda providing the study results are included in Attachment E6 (Table 1.4-3). The status of Study 6.1 is described below.

- Study 6.1, *Riparian Habitat Upstream of Englebright Reservoir*. The study required YCWA to: 1) perform riparian vegetation surveys and condition assessments at 20 sites upstream of Englebright Dam; 2) review historical aerial photographs to determine, if possible, trends in riparian vegetation; and 3) collaborate with Relicensing Participants regarding the need for additional data collection or analysis. YCWA completed items 1 and 2 and posted to the relicensing Website an Interim Technical Memorandum. For item 3, YCWA and Relicensing Participants agreed on a two-step process for additional data analysis. YCWA completed the first step (i.e., develop flow-stage relationships and other tools to assess changes in stage) and provided the information to Relicensing Participants on September 28, 2013. The second step includes consultation with Relicensing Participants regarding additional analysis. Depending on availability of Relicensing Participants, YCWA expects to complete the second step and post to the relicensing Website a final technical memorandum by January 15, 2013. Information available from Study 6.1 as of the date of the DLA has been included in the DLA.

3.3.4.1 Affected Environment

This section describes existing terrestrial resources in two general areas: 1) botanical resources; and 2) wildlife resources.

3.3.4.1.1 Botanical Resources

Botanical resources are discussed in four areas: 1) special-status and CESA-listed plants;¹ 2) vegetation distribution and abundance; 3) riparian habitat and wetlands; and 4) non-native invasive plants (NNIP).²

Special-Status and CESA-Listed Plants

Based on a 2012 review of Cal Fish and Wildlife's California Natural Diversity Database (CNDDDB) RareFind 4 (CDFG 2009a), the CNPS Inventory of Rare and Endangered Plants database (CNPS 2012), and a review of the PNF's and the TNF's sensitive and Watch List Species lists (Forest Service 2010a, c, d), YCWA identified 69 special-status plant species and three mushrooms with the potential to occur within the FERC Project Boundary (YCWA 2012a, b). Table 3.3.4-1 lists the special-status plant and mushroom species potentially occurring in the Project Vicinity.

¹ For the purpose of this Exhibit E, a special-status plant is defined as vascular, non-vascular, or mushroom species that meets one or more of the following criteria: 1) found on NFS land and formally listed as a Forest Service Sensitive Species for the PNF or the TNF or as a Forest Service Watch List Species by the PNF or the TNF; 2) listed by Cal Fish and Wildlife as a *State and Federally Listed Endangered, Threatened, and Rare Plants of California*, including those plants that are state-listed rare or a state candidate for listing species under the Native Species Plant Protection Act of 1977 (CDFG 2012); 3) proposed for listing under the ESA, including species that are proposed for listing as endangered (FPE) or threatened, a candidate for listing, or proposed for delisting; and 4) listed by the California Native Plant Society (CNPS) on its *Inventory of Rare and Endangered Plants*, including species that are rated as CNPS 1A through 4B (CNPS 2012). Plants listed as endangered or threatened under the ESA are discussed in Section 3.3.5.

² For the purpose of this document, non-native invasive plants (NNIP) are defined as A-, B-, C- and Q-listed species by the California Department of Food and Agriculture (CDFA), and species of concern on the PNF's and/or TNF's 2012 Weed Lists. "Non-native invasive plant (NNIP)" replaced "noxious weeds," per Forest Service Manual (FSM) 2900, which replaced FSM 2080 (noxious weed management) (76 FR 75860).

Table 3.3.4-1. Special-status plant and mushroom species potentially occurring in the vicinity of Yuba County Water Agency's Yuba River Development Project.

Species		Status ^{2, 3}	Flowering Period	Elevation Range (ft)	Habitat Requirements	Occurrence in Project Vicinity ⁴
Common Name	Scientific Name ¹					
SPECIAL-STATUS PLANTS						
Henderson’s bent grass	<i>Agrostis hendersonii</i>	FW-P CNPS 3.2	Apr-Jun	200-1,000	Valley and foothill grasslands, vernal pools	Present in the Project Vicinity, including Brush Creek quadrangle
Jepson’s onion	<i>Allium jepsonii</i>	FSS-P CNPS 1B.2	Apr-Aug	950-4,500	Chaparral, cismontane woodland, lower montane coniferous forest	Potential to occur in Project Boundary
Sanborn’s onion	<i>Allium sanbornii</i> var. <i>congdonii</i>	FW-T FW-P CNPS 4.2	Apr-Jul	950-3,250	Cismontane woodland, lower montane coniferous forest	Present in the Project Vicinity, including the Washington quadrangle
Sanborn’s onion	<i>Allium sanbornii</i> var. <i>sanbornii</i>	FW-T CNPS 4.2	May-Sep	850-5,000	Chaparral, cismontane woodland, serpentine	Present in the Project Vicinity, including the Challenge, Nevada City, Clipper Mills, Rackerby, and Washington quadrangles
True’s manzanita	<i>Arctostaphylos mewukka</i> ssp. <i>truei</i>	CNPS 4.2	Feb-Jul	1,400-4,550	Chaparral, lower montane coniferous forest, sometimes roadsides	Potential to occur in Project Boundary
Nissenan manzanita	<i>Arctostaphylos nissenana</i>	CNPS 1B.2	Feb-Mar	1,400-3,650	Closed-cone coniferous forest, chaparral	Potential to occur in Project Boundary
Webber’s milk-vetch	<i>Astragalus webberi</i>	FSS-T CNPS 1B.2	May-Jul	2,700-4,000	Lower montane coniferous forest	Potential to occur in Project Boundary
big-scale balsamroot	<i>Balsamorhiza macrolepis</i> [<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>]	CNPS 1B.2	Mar-Jun	300-4,600	Chaparral, cismontane woodland, and valley and foothill grassland, sometimes serpentine	Present in the Project Vicinity, including the Brush Creek quadrangle
Constance’s rockcress	<i>Boechera constancei</i> [<i>Arabis constancei</i>]	FSS-P CNPS 1B.1	May-Jul	2,600-6,650	Chaparral, lower montane coniferous forest, upper montane coniferous forest, serpentine soils	Present in the Project Vicinity, including the La Porte quadrangle
threadleaf beakseed	<i>Bulbostylis capillaris</i>	FW-P CNPS 4.2	Jun-Aug	1,300-6,800	Lower montane coniferous forest, meadows and seeps, upper montane coniferous forest	Potential to occur in Project Boundary
Butte County calycadenia	<i>Calycadenia oppositifolia</i>	FSS-P CNPS 4.2	Apr-Jul	300-3,100	Chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland and volcanic, granitic or serpentine soils	Potential to occur in Project Boundary
Butte County morning-glory	<i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i>	FSS-P CNPS 4.2	May-Jul	1,950-5,000	Chaparral, lower montane coniferous forest, rocky soil, sometimes roadsides	Potential to occur in Project Boundary
milk maids, California toothwort	<i>Cardamine californica</i> [<i>Cardamine pachystigma</i> var. <i>dissectifolia</i>]	FW-P CNPS 1B.2	Feb-May	800-6,900	Chaparral, lower montane coniferous forest	Present in the Project Vicinity, including Cascade , Brush Creek, Strawberry, Camptonville and Forbestown quadrangles
Siskiyou sedge	<i>Carex scabriuscula</i> [<i>Carex gigas</i>]	FSS-P CNPS 4.3	May-Jul	2,350-7,700	Mesic, sometimes serpentine seeps, lower montane coniferous forest, meadows and seeps, upper montane coniferous forest	Potential to occur in Project Boundary
Mendocino sedge	<i>Carex mendocinensis</i>	FSS-T FSS-P	May-Jul	500-5,250	Moist areas, often serpentine	Potential to occur in Project Boundary

Table 3.3.4-1. (continued)

Species		Status ^{2, 3}	Flowering Period	Elevation Range (ft)	Habitat Requirements	Occurrence in Project Vicinity ⁴
Common Name	Scientific Name ¹					
SPECIAL-STATUS PLANTS (continued)						
Red Hills soaproot	<i>Chlorogalum grandiflorum</i>	FW-T CNPS 1B.2	May-Jun	800-3,800	Chaparral, cismontane woodland, lower montane coniferous forest, serpentine or gabbro soils	Potential to occur in Project Boundary
Brandegee's clarkia	<i>Clarkia biloba</i> ssp. <i>brandegeae</i>	FSS-P FSS-T CNPS 1B.2	May-Jul	200-3,000	Chaparral, cismontane woodland, often roadcuts	Present in the Project Vicinity, including Pike, Camptonville, Challenge, French Corral, and Oregon House quadrangles
white-stemmed clarkia	<i>Clarkia gracilis</i> ssp. <i>albicaulis</i>	FSS-P CNPS 1B.2	May-Jul	800-3,500	Chaparral, cismontane woodland, sometimes serpentine	Present in the Project Vicinity, including the Forbestown quadrangle
Mildred's fairyfan	<i>Clarkia mildrediae</i> ssp. <i>lutescens</i>	FW-P CNPS 4.2	Jun-Aug	900-5,750	Cismontane woodland, lower montane coniferous forest, often roadcuts	Present in the Project Vicinity, including Cascade, Clipper Mills, Bush Creek and Strawberry Valley quadrangles
Mildred's clarkia	<i>Clarkia mildrediae</i> ssp. <i>mildrediae</i>	FSS-P CNPS 1B.3	May-Aug	800-5,600	Cismontane woodland, lower montane coniferous forest/sandy, usually granitic	Present in the Project Vicinity, including the Brush Creek quadrangle
Mosquin's clarkia	<i>Clarkia mosquinii</i>	FSS-P CNPS 1B.1	May-Jul	600-4,000	Cismontane woodland, lower montane coniferous forest/rocky, roadsides	Present in the Project Vicinity, including Clipper Mills, Strawberry Valley, Cascade, and Brush Creek quadrangles
Mac Nab cypress	<i>Hesperocyparis macnabiana</i> [<i>Cupressus macnabiana</i>]	FW-P	--	900-2,750	Chaparral, oak woodland, coniferous woodlands, serpentine or infertile soils	Potential to occur in Project Boundary
California lady's-slipper	<i>Cypripedium californicum</i>	FW-P CNPS 4.2	Apr-Aug	100-9,000	Bogs and fens, lower montane coniferous forest seeps and streambanks, usually serpentine	Present in the Project Vicinity, including La Porte and Strawberry Valley quadrangles
clustered lady's-slipper	<i>Cypripedium fasciculatum</i>	FSS-T FSS-P CNPS 4.2	Mar-Aug	500-7,200	Lower montane coniferous forest, North Coast coniferous forest, mixed conifer	Potential to occur in Project Boundary
mountain lady's-slipper	<i>Cypripedium montanum</i>	FSS-T CNPS 4.2	Mar-Aug	600-7,500	Broad-leaved upland forest, cismontane woodland, lower montane coniferous forest, North Coast coniferous forest, mixed conifer	Potential to occur in Project Boundary
northern small yellow lady's-slipper	<i>Cypripedium parviflorum</i> var. <i>makasin</i>	CNPS 3.1	May-Aug	Below 4,900	Bogs and fens, meadows and seeps	Present in Project Vicinity, including the Strawberry Valley quadrangle
California pitcher plant	<i>Darlingtonia californica</i>	FW-T FW-P CNPS 4.2	Apr-Jul	Below 8,500	Bogs and fens, meadows and seeps, generally serpentinite seeps	Present in the Project Vicinity, including the Goodyear's Bar, quadrangle
Norris' beard moss	<i>Didymodon norrisii</i>	FW-P CNPS 2.2	--	1,950-6,400	Cismontane woodland, lower montane coniferous forest	Potential to occur in Project Boundary
dwarf downingia	<i>Downingia pusilla</i>	CNPS 2.2	Mar-May	Below 1,400	Valley and foothill grassland, vernal pools	Potential to occur in Project Boundary
English sundew	<i>Drosera anglica</i>	FW-T CNPS 2.3	Jun-Sep	4,250-6,650	Bogs and fens, meadows and seeps	Potential to occur in Project Boundary
round-leaved sundew	<i>Drosera rotundifolia</i>	FW-T FW-P	Jun-Sep	Below 6,650	Bogs and fens, meadows and seeps	Potential to occur in Project Boundary

Table 3.3.4-1. (continued)

Species		Status ^{2, 3}	Flowering Period	Elevation Range (ft)	Habitat Requirements	Occurrence in Project Vicinity ⁴
Common Name	Scientific Name ¹					
SPECIAL-STATUS PLANTS (continued)						
Clifton's eremogone	<i>Eremogone cliftonii</i>	FW-P CNPS 1B.3	Apr-Sep	1,500-5,800	Chaparral, lower and upper montane coniferous forest/openings, usually granitic	Present in the Project Vicinity, including Cascade and Brush Creek quadrangles
Northern Sierra daisy	<i>Erigeron petrophilus</i> var. <i>sierrensis</i>	FW-T CNPS 4.3	Jun-Oct	900-5,700	Cismontane woodland, lower montane coniferous forest, upper montane coniferous forest, rocky soils	Potential to occur in Project Boundary; present in the TNF
Ahart's sulfur flower	<i>Eriogonum umbellatum</i> var. <i>ahartii</i>	FSS-P CNPS 1B.2	Jun-Sep	1,300-3,300	Serpentine soils	Present in the Project Vicinity, including Challenge, Cascade, and Clipper Mills quadrangles
minute pocket moss	<i>Fissidens pauperculus</i>	FSS-P CNPS 1B.2	--	Below 3,600	Not well known	Present in the Project Vicinity, including Cascade, Brush Creek, and Forbestown quadrangles
Pursh's buckthorn	<i>Frangula purshiana</i> ssp. <i>ultramafica</i>	FSS-P CNPS 1B.2	May-Jul	2,700-6,350	Chaparral, lower montane coniferous forest, meadows and seeps, upper montane coniferous forest, serpentine soils	Potential to occur in Project Boundary
Butte County fritillary	<i>Fritillaria eastwoodiae</i>	FSS-T FSS-P CNPS 3.2	Mar-Jun	150-4,900	Chaparral, cismontane woodland, lower montane coniferous forest, sometimes serpentine	Present in the Project Vicinity, including Challenge, French Corral, Clipper Mills, North Bloomfield, Washington, Rackerby, Cascade, Brush Creek, Forbestown, and Nevada City quadrangles
Ahart's dwarf rush	<i>Juncus leiospermus</i> var. <i>ahartii</i>	CNPS 1B.2	Mar-May	100-750	Valley and foothill grassland	Present in the Project Vicinity, including the Loma Rica quadrangle
dubious pea	<i>Lathyrus sulphureus</i> [<i>Lathyrus sulphureus</i> var. <i>argillaceus</i>]	CNPS 3	Apr-May	500-1,000	Cismontane woodland, upper and lower montane coniferous forest	Present in the Project Vicinity, including Rough and Ready and Wolf quadrangles
legenere	<i>Legenere limosa</i>	CNPS 1B.1	Apr-Jun	Below 2,900	Vernal pools	Potential to occur in Project Boundary
Cantelow's lewisia	<i>Lewisia cantelovii</i>	FSS-P FSS-T CNPS 1B.2	May-Oct	1,000-4,500	Broadleaf upland forest, chaparral, cismontane woodland, lower montane coniferous forest/mesic, granitic, sometimes serpentine seeps	Present in the Project Vicinity including Pike, French Corral, Strawberry Valley, Alleghany, North Bloomfield, Washington, Goodyears Bar, Downieville, and Brush Creek quadrangles
Humboldt lily	<i>Lilium humboldtii</i> ssp. <i>humboldtii</i>	FW-T FW-P CNPS 4.2	May-Jul	1,500-3,500	Chaparral, cismontane woodland, lower montane coniferous forest, openings	Present in the Project Vicinity, including the Washington quadrangle
Quincy lupine	<i>Lupinus dalesiae</i>	FSS-T FSS-P CNPS 4.2	May-Aug	2,800-8,000	Chaparral, cismontane woodland, lower montane coniferous forest, upper montane coniferous forest	Present in the Project Vicinity, including La Port and Goodyears Bar quadrangles
bog club-moss	<i>Lycopodiella inundata</i>	CNPS 2.2	Jun-Sep	Below 3,300	Bogs and fens, lower montane coniferous forest, marshes and swamps	Present in the Project Vicinity, including the North Bloomfield quadrangle

Table 3.3.4-1. (continued)

Species		Status ^{2, 3}	Flowering Period	Elevation Range (ft)	Habitat Requirements	Occurrence in Project Vicinity ⁴
Common Name	Scientific Name ¹					
SPECIAL-STATUS PLANTS (continued)						
elongate copper moss	<i>Mielichhoferia elongata</i>	FSS-T CNPS 2.2	--	1,600-4,300	Vernally wet rock in cismontane woodland, metamorphic rock, usually vernally mesic	Present in the Project Vicinity, including Washington and Nevada City quadrangles
shieldbract monkeyflower	<i>Mimulus glaucescens</i>	FW-P CNPS 4.3	Feb-Aug	200-4,100	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland and serpentine seeps, sometimes streambanks	Potential to occur in Project Boundary
cut-leaved monkey flower	<i>Mimulus laciniatus</i>	CNPS 4.3	Apr-Jun	1,500-9,000	Chaparral, lower montane coniferous forest, upper montane coniferous forest, seeps in granite	Potential to occur in Project Boundary
Follett's monardella	<i>Monardella follettii</i>	FSS-T FSS-P CNPS 1B.2	Jun-Sep	1,900-6,600	Lower montane coniferous forest, rocky, serpentine	Present in the Project Vicinity, including the Grass Valley quadrangle
aquatic lichen	<i>Peltigera hydrothyria</i> [<i>Hydrothyria venosa</i>]	FSS-T FSS-P	--	1,150-7,000	Stones, boulders, and occasionally wood along streams and rivers, submerged at least part of the year	Potential to occur in Project Boundary; known to occur within 3 miles of the Project area at about 3,400 ft
Bacigalupi's yampah	<i>Perideridia bacigalupii</i>	FW-P CNPS 4.2	Jun-Aug	1,700-3,500	Chaparral, lower montane coniferous forest, serpentine	Potential to occur in Project Boundary; present in the TNF
Stebbins' phacelia	<i>Phacelia stebbinsii</i>	FSS-T CNPS 1B.2	May-Jul	2,000-6,600	Cismontane woodland; lower montane coniferous forest; meadows and seeps	Potential to occur in Project Boundary
Cedar Crest popcorn flower	<i>Plagiobothrys glyptocarpus</i> var. <i>modestus</i>	CNPS 3	Apr-Jun	150-2,850	Cismontane woodland, valley and foothill grassland	Present in the Project Vicinity, including Oregon House and Grass Valley quadrangles
green- flowered wintergreen	<i>Pyrola chlorantha</i>	CNPS 1A	Jun-Jul	±2,950	Lower montane coniferous forest	Present in the Project Vicinity, including the Downieville quadrangle
sticky pyrrocoma	<i>Pyrrocoma lucida</i>	CNPS 1B.2	Jul-Oct	2,300-6,400	Great Basin scrub, lower montane coniferous forest, meadows and seeps	Present in the Project Vicinity, including the Camptonville quadrangle
white beaked-rush	<i>Rhynchospora alba</i>	FW-T CNPS 2.2	Jul-Aug	200-6,700	Meadows and seeps, marshes and swamps, wet places	Potential to occur in Project Boundary; present in the TNF
brownish beaked-rush	<i>Rhynchospora capitellata</i>	FW-P CNPS 2.2	Jul-Aug	1,500-6,600	Upper and lower montane coniferous forest, meadows and seeps, marshes and swamps	Present in the Project Vicinity, including Pike, Clipper Mills, Grass Valley, North Bloomfield, Cascade, Brush Creek, and Nevada City quadrangles
Tracy's blacksnakeroot	<i>Sanicula tracyi</i>	CNPS 4.2	Apr-Jun	300-5,200	Cismontane woodland, lower montane coniferous forest, openings in upper montane coniferous forest	Present in the Project Vicinity, including the Clipper Mills quadrangle
swaying bulrush	<i>Schoenoplectus subterminalis</i> [<i>Scirpus subterminalis</i>]	FW-P CNPS 2.3	Jun-Aug	2,450-7,400	Bogs and fens, marshes and swamps, montane lake margins	Potential to occur in Project Boundary
marsh skullcap	<i>Scutellaria galericulata</i>	CNPS 2.2	Jun-Sep	Below 6,900	Lower montane coniferous forest, meadows and seeps, marshes and swamps	Potential to occur in Project Boundary
Feather River stonecrop	<i>Sedum albomarginatum</i>	FSS-P CNPS 1B.2	May-Jun	850-6,400	Chaparral, lower montane coniferous forest and serpentine soils	Potential to occur in Project Boundary

Table 3.3.4-1. (continued)

Species		Status ^{2, 3}	Flowering Period	Elevation Range (ft)	Habitat Requirements	Occurrence in Project Vicinity ⁴
Common Name	Scientific Name ¹					
SPECIAL-STATUS PLANTS (continued)						
Lewis' groundsel	<i>Packera eurycephala</i> var. <i>lewisrosei</i> [<i>Senecio eurycephalus</i> var. <i>lewisrosei</i>]	FSS-P CNPS 1B.2	Mar-Sep	900-6,200	Chaparral, cismontane woodland, lower montane coniferous forest	Potential to occur in Project Boundary
peat moss	<i>Sphagnum</i> spp.	FW-T	--	--	Fens, peatlands, and wet areas	Potential to occur in Project Boundary
long-fruit jewelflower	<i>Streptanthus longisiliquus</i>	FW-P CNPS 4.3	Apr-Sep	2,300-4,900	Openings in cismontane woodland lower montane coniferous forest	Potential to occur in Project Boundary
slender-leaved pondweed	<i>Stuckenia filiformis</i> [<i>Potamogeton filiformis</i>]	FW-T CNPS 2.2	May-Jul	950-7,050	Marshes and swamps, lakes and ponds	Potential to occur in Project Boundary
cylindrical trichodon	<i>Trichodon cylindricus</i>	FW-P CNPS 2.2	--	150-6,600	Broadleaf upland forest, meadows and seeps, upper montane coniferous forest/sandy, exposed soil, roadbanks	Present in the Project Vicinity, including the La Porte quadrangle
lesser bladderwort	<i>Utricularia minor</i>	FW-T CNPS 4.2	Jul	2,600-2,900	Bogs and fens, marshes, swamps and calcium-rich water	Potential to occur in Project Boundary
SPECIAL-STATUS MUSHROOMS						
branched collybia	<i>Collybia racemosa</i>	FSS-T FSS-P	Fall fruiting	Unknown	Older forest habitats	Potential to occur in Project Boundary.
large cudonia	<i>Cudonia monticola</i>	FSS-T FSS-P	Fall fruiting	Unknown	Older forest habitats	Potential to occur in Project Boundary.
olive phaeocollybia	<i>Phaeocollybia olivacea</i>	FSS-T FSS-P	Fall fruiting	Unknown	Older forest habitats	Present in the Project Boundary, Camptonville quadrangle

Sources: Forest Service (2010a, c, d), CNPS (2012)

¹ Old genus and species names are in [].

² Special-status:

CNPS: California Native Plant Society listed species (CNPS 2012)

1A: Species presumed extinct in California

1B: Species considered rare or endangered in California and elsewhere

2: Species considered rare or endangered in California, but more common elsewhere

3: More information needed about this species

4: Limited distribution; watch list

“1” after CNPS rating indicates a species that is seriously endangered in California, “2” after CNPS rating indicates a species that is fairly endangered in California, “3” after CNPS rating indicates a species that is not very endangered in California.

FSS-P: Forest Service Sensitive Species for PNF (Forest Service 2010a)

FSS-T: Forest Service Sensitive Species for TNF (Forest Service 2010c,d)

FW-P: Forest Service Watch List Species for PNF (Forest Service 2010a)

FW-T: Forest Service Watch List Species for TNF (Forest Service 2010c,d)

³ Recent taxonomic treatments may affect the status of some species (Baldwin et al. 2012). For the purposes of Exhibit E, YCWA did not address changes to status after FERC-approved studies were initiated.

⁴ Occurrence in Project Vicinity results based on a search of USGS quadrangles (CNPS 2012).

In 2012, YCWA performed surveys for special-status plants. Surveys followed the botanical survey protocol section of Cal Fish and Wildlife's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009b). The study included the area within the existing FERC Project Boundary. The study area also included a buffer of 100 ft extending upslope from the NMWSE of the Project reservoir and impoundments, and 100 ft around Project recreation facilities, some of which were partially included in the existing FERC Project Boundary.

YCWA's study found five special-status plants with 51 occurrences.³ Three occurrences of olive phaeocollybia (*Phaeocollybia olivacea*), mapped by the TNF, were included in this analysis. Twenty occurrences occurred within the TNF; four occurrences occurred within the PNF; 19 occurrences occurred on YCWA land; and five occurrences occurred on private land. One occurrence was located both on TNF and YCWA land and one on both PNF and YCWA land. One of the occurrences of olive phaeocollybia was located across TNF, YCWA and private lands. Table 3.3.4-2 summarizes the 51 special-status plant occurrences by land ownership. No CESA-listed plants were located during YCWA's study.

Table 3.3.4-2. Special-status plants and mushrooms identified in the Yuba River Development Project study area.

Species		Status ²	Occurrence Identification ¹ Number by Land Ownership			
Common Name	Scientific Name		TNF	PNF	YCWA	Other Private
SPECIAL-STATUS PLANTS						
Brandegee's clarkia	<i>Clarkia biloba</i> ssp. <i>brandegeae</i>	FSS-P FSS-T CNPS 1B.2	1, 5	--	3, 6, 7	4
Clustered lady's-slipper	<i>Cypripedium fasciculatum</i>	FSS-P FSS-T CNPS 4.2	8	--	--	--
Butte County fritillary	<i>Fritillaria eastwoodiae</i>	FSS-P FSS-T CNPS 3.2	20	--	9, 17, 18, 21	--
Cantelow's lewisia ³	<i>Lewisia cantelovii</i>	FSS-P FSS-T CNPS 1B.2	24, 25, 26, 27, 28, 30	--	22, 23, 28, 29, 31, 32, 33	--
Humboldt lily ⁴	<i>Lilium humboldtii</i> ssp. <i>humboldtii</i>	FSS-P FSS-T CNPS 4.2	36, 37, 38, 39, 49, 55, 59, 61, 63	41, 42, 54, 57, 64	45, 47, 48, 52, 53, 56, 57	34, 35, 43, 44
SPECIAL-STATUS MUSHROOMS						
olive phaeocollybia ⁵	<i>Phaeocollybia olivacea</i>	FSS-P FSS-T	10, 11, 12	--	10	10
Total			22	5	22	6

¹ For reference purposes, YCWA assigned a distinct identification number to each occurrence. Occurrence details and locations included in Attachment 5-1E and Attachment 5-1D, respectively, of Technical Memorandum 5-1, *Special-Status Plants*, which is included in Appendix E6 of this Exhibit E.

² CNPS: California Native Plant Society listed species

1B: Species considered rare or endangered in California and elsewhere

3: More information needed about this species

4: Limited distribution; watch list

"2" after CNPS rating indicates a species that is fairly endangered in California

FSS-P: Forest Service Sensitive Species for Plumas National Forest (Forest Service 2010a)

FSS-T: Forest Service Sensitive Species for Tahoe National Forest (Forest Service 2010c, d)

³ Cantelow's lewisia, occurrence 28, spans the property boundary for lands managed by TNF and YCWA.

⁴ Humboldt lily, occurrence 57, spans the property boundaries for lands managed by PNF and YCWA.

⁵ Olive phaeocollybia, occurrence 10, spans the property boundaries for lands managed by TNF, YCWA and private lands.

³ An occurrence is defined as the location of either a single special-status plant species or a distinct geographic population of special-status plant species. For reference purposes, YCWA assigned a distinct identification number to each occurrence.

The most abundant special-status plant was the Humboldt lily (*Lilium humboldtii* ssp. *humboldtii*) (24 occurrences), which were found growing either adjacent to roads or near pedestrian trails, in and around campgrounds within Douglas fir (*Pseudotsuga menziesii*) and Ponderosa pine (*Pinus ponderosa*) dominated habitat. Cantelow's lewisia (*Lewisia cantelovii*) was the second most abundant species, with 12 occurrences found growing on steep rocky cliffs within habitat dominated by canyon live oak (*Quercus chrysolepis*) and some Douglas fir in the northern arm of New Bullards Bar Reservoir. Six occurrences of Brandegee's clarkia (*Clarkia biloba* ssp. *brandegeae*) were found. Two occurrences were located in the cutbank along Our House Diversion Dam Road in habitat dominated by an overstory of black oak (*Quercus kelloggii*) and tan oak (*Lithocarpus densiflorus*), three occurrences near the New Bullards Bar Reservoir hiking trail, with an overstory dominated by Douglas fir and oaks (*Quercus* spp.), and one occurrence in an area with the overstory dominated by canyon live oak and California laurel (*Umbellularia californica*) on the rocky cliffs that abut New Bullards Bar Dam Access Road. Other special-status plants found included Butte County fritillary (*Fritillaria eastwoodiae*) (five occurrences) and one occurrence of clustered lady's-slipper (*Cypripedium fasciculatum*). Three known occurrences of TNF-mapped olive phaeocollybia, a special-status mushroom, were included in this analysis (Table 3.3.4-2).

Of the 51 special-status plant occurrences, 19 were found on land owned by YCWA along roads, in and around recreation facilities, in remote areas associated with New Bullards Bar Reservoir and in areas associated with New Bullards Bar Dam. Twenty occurrences were found within the TNF on NFS land, and four occurrences were found within the PNF on NFS land along roads, in and around recreation facilities, and in remote areas associated with New Bullards Bar Reservoir. Five occurrences were found on private property along roads, in and around recreation facilities, and in remote areas associated with New Bullards Bar Reservoir (Table 3.3.4-2).

Life History of Special-Status Plants and Mushroom Found by YCWA or Reported to Occur by the Forest Service

Brandegee's Clarkia (FSS-P, FSS-T & CNPS 1B.2)



Brandegee's clarkia is a small (less than 3.5 ft tall) herbaceous annual with an erect stem. The leaves of Brandegee's clarkia are about 0.75 to 2.4 in long, narrow, and have pinnate veins emanating from the mid-vein. Its pink to purple flowers (sometimes tinged with red) are widely rotate with wedge-shaped petals. A diagnostic taxonomic character for Brandegee's clarkia is the length of the petal lobes, which are generally less than one fifth the length of the entire petal. It is generally found growing in the Sierra Nevada foothill woodlands at elevations ranging from 1,260 to 4,495 ft (Lewis and Lewis 2012).

YCWA located six occurrences of Brandegee's clarkia within the study area: occurrences one and four are located in the cut bank along Our House Diversion Dam Road; occurrences five, six and seven are near the New Bullards Bar Reservoir hiking trail, which hugs the southeast shore of New Bullards Bar

Reservoir; and occurrence three is in the rocky cliffs that abut New Bullards Bar Dam Access Road. More than 500 plants were recorded.

Brandegee's clarkia occurrences near Our House Diversion Dam Road are in habitat dominated by an overstory of black oak and tan oak, with an understory dominated by California buckeye (*Aesculus californica*), birch leaf mountain mahogany (*Cercocarpus betuloides*), deer brush (*Ceanothus integerrimus*) and annual grasses.

Occurrences near Bullards Bar hiking trail are in habitat dominated by an overstory of Douglas fir, tan oak, black oak and canyon live oak, with an understory dominated by poison oak (*Toxicodendron diversilobum*), deer brush, Pacific dogwood (*Cornus nuttallii*), big leaf maple (*Acer macrophyllum*), gold back fern (*Pentagramma triangularis*) and pink honeysuckle (*Lonicera hispidula*).

Occurrence three was located on a rocky cliff face adjacent to the New Bullards Bar Dam access road. The habitat in this area is dominated by an overstory of canyon live oak and California laurel, with an understory of poison oak, deer brush, California buckeye and sticky monkeyflower (*Mimulus aurantiacus*).

The majority of Brandegee's clarkia was flowering at the time of surveys, and all occurrences appeared to be in fair to good⁴ condition.

Clustered Lady's-Slipper (FSS-T, FSS-P & CNPS 4.2)



Clustered lady's-slipper is a perennial species of the orchid family (*Orchidaceae*). It grows on other plants, feeding on nutrition from the association of the roots with fungi. Individual plants are 4.7 to 7.8 in tall with two, opposite and widely-elliptic leaves. The flowers grow in clusters of one to 14 per stem. Clustered lady's-slipper flowers are those typical of most orchids; both petals and sepals are ornate and petal-like. The green to brown sepals and petals are positioned in whorls around a modified, chin-like petal. It prefers mesic to moist, shady conifer forest in elevations ranging from 330 to

6,565 ft (Howell 2012).

YCWA located one occurrence of clustered lady's-slipper within the study area; occurrence 8 is adjacent to the New Bullards Bar Reservoir hiking trail. Six plants were recorded.

Clustered lady's-slipper habitat is dominated by an overstory of tan oak, canyon live oak, and Pacific dogwood, with an understory of poison oak, pink honeysuckle, woodland star (*Trientalis latifolia*) and Hooker's fairybell (*Disporum hookeri*).

⁴ Cal Fish and Wildlife uses qualitative terms (e.g., poor, fair, good and excellent) as a means to describe the overall vigor of the population, safety of the plants from external impacts, and quality of the habitat (CDFG 2009b).

Clustered lady's-slipper was fruiting at the time of the surveys and the occurrence appeared to be in good condition.

Butte County Fritillary (FSS-T, FSS-P & CNPS 3.2)



Butte County fritillary is a tall (7.9 to 31.5 in) perennial found in dry benches and slopes at elevations less than 5,000 ft. Each individual has one stem supporting one to two whorls of three to five leaves. Butte County fritillary flowers are generally bell-shaped with spreading petals ranging in color from green to yellow to red (MacFarl 2012).

YCWA located five occurrences of Butte County fritillary within the study area; occurrences 9, 17 and 18 are on a cliff face adjacent to the New Bullards Bar Dam Access Road, and occurrences 20 and 21 are on a cliff-like cut bank adjacent to Forest Service Road 0008-010. More than 500 plants were recorded.

Butte County fritillary along New Bullards Bar Dam Access Road are in habitat dominated by an overstory of Douglas fir, Ponderosa pine and interior live oak (*Quercus wislizeni*), and an understory of whiteleaf manzanita (*Arctostaphylos viscida*), deer brush and poison oak.

Occurrences near Forest Service Road 0008-010 are in a recently burned area,⁵ with an overstory dominated by canyon live oak, madrone (*Arbutus menziesii*), and black oak and a recovering understory of common woolly sunflower (*Eriophyllum lanatum*), wild mock orange (*Philadelphus lewisii*), California buckeye, verileaf phacelia (*Phacelia heterophylla*) and toyon (*Heteromeles arbutifolia*).

Butte County fritillary was both flowering and fruiting at the time of the surveys, and all occurrences appeared to be in good condition.

Cantelow's Lewisia (FSS-P, FSS-T & CNPS 1B.2)



Cantelow's lewisia is a fleshy perennial with a basal rosette of spoon-shaped, serrate leaves. In general, Cantelow's lewisia is 5.9 to 11.8 in tall with several stems and a wide, open panicle of only a few flowers. The petals are rounded and pink with deeper colored veins. It grows in granite cliff faces and rocky outcrops, often associated with seeps in chaparral woodlands or conifer forests at elevations ranging from 1,260 to 4,495 ft (Kellogg 2012).

⁵ A fire burned several areas around the New Bullards Bar Reservoir and the North San Juan area in 2010.

YCWA located 12 occurrences of Cantelow's lewisia within the study area; all occurrences are on steep rocky cliffs in the northern arm of New Bullards Bar Reservoir, approximately 1 to 2 mi west of the North Yuba River. More than 2,000 plants were recorded.

Cantelow's lewisia is on steep, mossy cliff faces amongst habitat dominated by an overstory of canyon live oak with some Douglas fir, big leaf maple, madrone and black oak. Cantelow's lewisia habitat is home to several other cliff-dwelling species, including broadleaf stonecrop (*Sedum spathulifolium*), narrowleaf swordfern (*Polystichum imbricans*), littleleaf minerslettuce (*Montia parvifolia*) and crevice alumroot (*Heuchera micrantha*).

Cantelow's lewisia was observed in all life stages at the time of survey, including vegetative, flowering and fruiting. All occurrences appeared to be in good to excellent condition.

Humboldt Lily (FW-T, FW-P & CNPS 4.2)



Humboldt lily is easily recognized both by its height and many whorls of wavy, showy leaves. Its large flower (2.2 to 3.7 in) is widely bell-shaped with recurved petals of orange with magenta spots. Humboldt lily is found in chaparral woodlands and pine forests at elevations ranging from 650 to 3,610 ft (Skinner 2012).

YCWA located 24 occurrences of Humboldt lily within the study area. With one exception, all occurrences were either adjacent to access roads or near pedestrian trails and in and around campgrounds. The exception, occurrence 43, was on a rocky bank above Empire Creek, about 50 ft above New Bullards Bar Reservoir's NMWSE. More than 600 plants were recorded.

In general, Humboldt lily occurrences are in habitat dominated by an overstory of Douglas fir, Ponderosa pine, tan oak and madrone, with an understory of deer brush, Pacific dogwood, poison oak and western brackenfern (*Pteridium aquilinum*).

Olive Phaeocollybia⁶ (FSS-T & FSS-P)

The TNF provided mapped locations of three occurrences of olive phaeocollybia. Occurrence 10 is on the southeast shore of New Bullards Bar Reservoir, and occurrences 11 and 12 are in Hornswoggle and Schoolhouse campgrounds. Vegetation in these habitats is dominated by an overstory of Ponderosa pine and Douglas fir.

Olive phaeocollybia is a fall and winter fruiting mushroom with a slimy olive-green cap and a thick rooting stem. It occurs in mixed conifer forests in scattered to densely sprawling large rings (Arora 1986).

⁶ Photograph of olive phaeocollybia provided by Shasta-Trinity National Forest.



Due to the unpredictable blooming patterns of olive phaeocollybia (i.e. does not bloom every year) and because the TNF had previously confirmed the location and identification for olive phaeocollybia; YCWA did not verify location or identification of olive phaeocollybia in the locations provided by the TNF (Kathy VanZuuk, personal communication, September 28, 2011).

Vegetation Distribution and Abundance

In 2012, YCWA characterized the botanical communities⁷ in the Project Area during botanical relicensing surveys. The botanical communities are composed primarily of upland vegetation alliances, with minimal areas of wetland, riparian or littoral habitats.

The plant communities observed around Narrows 2 Powerhouse were Riparian, with areas of Blue Oak /Annual Grasslands and Gray Pine /Interior Live Oak.

New Colgate Power House is located in an area dominated by Gray Pine/Interior Live Oak, with a small area of Riparian along the main stem of the Yuba River.

New Bullards Bar Reservoir shorelines and Dam have various types of plant communities. Black Oak dominated communities are scattered throughout the slopes of the reservoir, with the exception of the eastern shore. Black Oak/Deer Brush dominated community was found on a southwest facing slope and Deer Brush communities dominated the west facing slopes. Douglas Fir dominated communities were found throughout the slopes of the reservoir, as well as Douglas Fir/Tan Oak communities. Small patches of Tan Oak were most concentrated in areas near Moran Road Day Use Areas and Boat Ramp, and Douglas Fir-Mixed Hardwood community was found on west facing slope of the north arm of the reservoir. Tan Oak-Deer Brush communities were most abundant along the north slope of the reservoir east of the Garden Point Boat-in Campground. Ponderosa Pine/Douglas Fir community was abundant around the reservoir, multiple Canyon Live Oak communities were identified on both the south and east facing slopes of the west shore of the reservoir and on the north facing slope of the North Yuba River canyon, and Mixed Hardwood communities were located on a south facing slope in the north arm of the reservoir.

The plant communities found in the area of Our House Diversion Dam include Ponderosa Pine/Incense Cedar, Douglas Fir, and a small area of Riparian along the Middle Yuba River.

Log Cabin Diversion Dam plant communities include Canyon Live Oak and Riparian on both sides of Oregon Creek.

⁷ Plant community names follow *The Manual of California Vegetation* (Sawyer et al. 2009). Plant community associations are differentiated according to strata. Species in differing strata are separated with a slash (/) with species in the uppermost stratum listed first. Species in the same stratum are separated with a dash (-) (CNPS 2012).

Riparian Habitats and Wetlands

YCWA reviewed existing information regarding riparian habitats and wetlands and found that 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. YCWA's PAD identifies all wetlands identified by NWI mapping; all wetlands mapped were categorized as palustrine or riverine by Cowardin et al. (1979). However, NWI maps are based on aerial imagery, typically not verified by ground surveys, and provide no information on plant species associated with the mapped areas. YCWA performed reconnaissance and field studies to obtain more accurate vegetation information.

In 2011 and 2012, YCWA identified sites for study of riparian habitats in Project affected stream reaches and examined potential locations for study of wetlands within the Project Boundary. YCWA identified seven assessment sites for riparian habitat in reaches upstream of Englebright Reservoir, as well as one cursory assessment site, and 12 large woody material (LWM)⁸ study sites. In the Yuba River downstream of the Englebright Dam, YCWA identified eight riparian habitat sites that coincided with eight LWM sites. YCWA used aerial imagery to reconnaissance wetlands; no wetlands were identified. YCWA also used field observations and vegetation mapping efforts of the botanical study crew to confirm that wetlands were not present in the Project Boundary.

Field efforts for riparian habitat studies upstream of Englebright Reservoir included surveys for riparian vegetation and LWM. At riparian assessment sites, transects were established to record species distribution within lateral areas of stream channels. YCWA recorded data for species dominance, abundance, richness, ground and canopy cover, as well as lateral and horizontal complexity. Seven of the 12 LWM assessment sites overlapped with the riparian assessment sites, at which quantities of LWM were recorded. YCWA also quantified the amount of LWM estimated annual volumes of wood trapped in Project facilities. In addition, YCWA conducted a historical aerial photograph analysis for the seven riparian assessment sites to identify major shifts in riparian stand structure, composition or surface area, as well as changes in land use, channel morphology and upland influences over time.

All riparian assessment sites supported woody species in various life stages, including mature trees, recruits (i.e., saplings) and seedlings, although the abundance of each often depended on the dominant substrates of the site. White alder (*Alnus rhombifolia*) was a species common to transects in all assessment sites, and red willow (*Salix laevigata*) was observed on transects in six of the eight sites. Other common woody species included sandbar willow (*S. exigua*), Oregon ash (*Fraxinus latifolia*), black locust (*Robinia pseudoacacia*), Fremont's cottonwood (*Populus fremontii*), Goodding's willow (*S. gooddingii*), arroyo willow (*S. lasiolepis*), shining willow (*S. lasiandra*), button willow (*Cephalanthus occidentalis*), American dogwood (*Cornus sericea*) and Pacific madrone. Woody species cover along vegetation transects ranged from as little as 1 percent in the North Yuba River, just upstream of the confluence with the Middle Yuba River, to 87 percent in the Middle Yuba River downstream of Our House Diversion Dam. Lower

⁸ Large woody material (LWM) was considered un-rooted wood meeting minimum size requirements of greater than 3 ft in length and 4 inches in diameter at the large end.

woody species cover was often associated with bedrock or boulder dominated assessment sites, and higher cover was often associated with sites dominated by cobbles, gravel and sand.

For three of the 12 riparian assessment sites (i.e., Middle Yuba downstream of Oregon Creek, North Yuba River, and Yuba River upstream of New Colgate Powerhouse), there was no visible change in riparian vegetation from earliest available photos (i.e., 1937 or 1939, depending on site) to 2009. In the Middle Yuba River, downstream of Our House Diversion Dam, and the Yuba River downstream of New Colgate Powerhouse riparian assessment site, riparian vegetation increased over the period between the earliest available photo (i.e., 1937 and 1939) to 2009. The Oregon Creek Celestial Valley sub-reach assessment site showed a visible change in floodplain vegetation, but no obvious change to riparian vegetation. The Middle Yuba River upstream of Oregon Creek assessment site showed localized increases and decreases over time, with an overall increase in riparian vegetation from the earliest available photo (i.e., 1937) to 2009.

At survey sites upstream of all LWM assessment sites, a total volume of 115.4 m³, or 232 pieces, of LWM was counted. Of these, 13 were key pieces.⁹ The Middle Yuba River near Yellowjacket Creek had the most LWM, with 45 pieces counted, while the Middle Yuba River upstream of Oregon Creek (~2 mi) had the fewest, with one piece of LWM.

For the riparian habitat in the Yuba River downstream of the Englebright Dam, field efforts included descriptive observations of woody and riparian vegetation, cottonwood inventory and coring, and a LWM survey. The study was performed by establishing eight LWM study sites and seven riparian habitat study sites. One LWM study site was established within each of eight distinct reaches (i.e., Marysville, Hallwood, Daguerre Point Dam, Dry Creek, Parks Bar, Timbuctoo Bend, Narrows and Englebright Dam). Riparian habitat sites were established in the same locations as the LWM study sites, with the exception of the Marysville study site. However, riparian information regarding the Marysville Reach was developed, but no analysis was performed because of backwater effects of the Feather River. In addition, YCWA conducted an analysis of the quantity of riparian vegetation observed in historical aerial photographs of study sites to assess changes in the cover and density of riparian vegetation over time. The photographs included in the analysis were from 1937, 1947, 1970, 1987 and 2010.

All reaches supported woody species in various life stages - mature trees, recruits and seedlings were observed within all reaches. Where individuals or groups of trees were less vigorous, beaver (*Castor canadensis*) activity was the main cause, although some trees in the Marysville Reach appeared to be damaged by human camping. The majority of the woody species present in the river valley include, in order of most to least number of individuals: various willow species (*Salix* sp.); Fremont cottonwood (i.e., cottonwoods); blue elderberry (*Sambucus nigra* ssp. *caerulea*); black walnut (*Juglans hindsii*); Western sycamore (*Platanus racemosa*); Oregon ash; white alder; tree of heaven (*Ailanthus altissima*); and gray pine (*Pinus sabiniana*).

⁹ Key pieces of LWM included all LWM that exceeded half of the average bankfull widths for each reach, exceeded 25 inches in diameter and 25 ft in length, or showed morphologic influence (e.g., trapping sediment or altering flow patterns).

The structure and composition of riparian vegetation was associated primarily with four landforms. Cobble-dominated banks supported primarily bands of willow shrubs with scattered hardwood trees. Areas with saturated soils or sands supported the most complex riparian areas and tended to be associated with backwater ponds. Scarps and levees supported lines of mature cottonwood and other hardwood species, typically with a simple understory of Himalayan blackberry (*Rubus armeniacus* [*Rubus discolor*]) or blue elderberry shrubs. Bedrock-dominated reaches had limited riparian complexity and supported mostly willow shrubs and cottonwoods.

Cottonwoods are one of the most abundant woody species in the study area, second only to willows. Cottonwoods exist in all life stages, including as mature trees, recruits, or saplings and as seedlings. Cottonwoods are more abundant in downstream areas of the study area relative to upstream, with a break in abundance from Daguerre Point Dam to Dry Creek reach, and again from Parks Bar Reach to Timbuctoo Bend. In addition, cottonwoods have relatively even distribution laterally across the valley floor. Of the estimated 18,540 cottonwood individuals/stands, 12 percent are within the channel band that would be wetted when flows were 5,000 cfs or less; 39 percent are within the channel band that would be wetted when flows were between 5,000 cfs and 21,100 cfs; 25 percent are within the channel band that would be wetted when flows were between 21,100 cfs and 84,400 cfs; and 24 percent are above the 84,400 cfs band. As reference, 5,000 cfs represents bankfull discharge, 21,000 cfs represents flows that would wet the current floodway, and 84,400 cfs would wet the full width of the current valley floor.

Ninety-seven cottonwood trees were cored to estimate age. Age estimates ranged from 11 to 87 years. The cottonwood tree age analysis resulted in age estimates that place the year of establishment for trees in a range of years from ± 7 to 16 years, which is too wide to allow for linking the establishment of trees to any year's specific conditions.

For six of the study sites (i.e., Marysville, Hallwood, Daguerre Point Dam, Dry Creek, Parks Bar and Timbuctoo Bend), the cumulative change from the earliest available photo (1937 or 1947, depending on site) to 2010 was an increase in riparian vegetation. In the Narrows and Englebright sites, the cumulative change was a decrease in riparian vegetation. However, at all sites, localized increases and decreases in riparian vegetation over time were identified when the photographs were compared in a stepwise manner (e.g., 1937 to 1947). The majority of these fluctuations were associated with natural and anthropogenic changes to channel alignment.

LWM was found in bands of willow shrubs near the wetted edge, dispersed across open cobble bars, and stranded above normal high-flow indicators. LWM consisted mostly of small material that would be floated by flows above 21,100 cfs. LWM equal to or exceeding 25 ft in length and 25 in at the large end, and LWM with morphologic influence (e.g., trapping sediment or altering flow patterns) were tallied as key pieces and information related to channel forming function was recorded. A total of 15 LWM key pieces were found in study sites.

Elderberry plants (*Sambucus* sp.) are the host plant of the VELB, which is listed as threatened under the ESA. Elderberry plants exist throughout the riparian study area, but are most abundant in the downstream-most reaches, including Marysville and Hallwood. The majority of plants are

distributed in areas above the valley floor and as proximity to the wetted edge of the river increases, the number of plants declines.

The riparian habitats were assessed as healthy and recovering from historical disturbances, based on the vigor and variety of age classes of the plants present. Riparian vegetation communities tended to be simplistic in structure both vertically and horizontally, indicating that they are developing from an early seral stage and have not yet become complex. The coarse substrate and lack of developed soils, combined with the flow regime, are likely to influence the distribution of riparian vegetation in the channel. Although woody riparian species of all age classes were distributed throughout the channel longitudinally and laterally, the majority were present between 10,000 and 15,000 cfs on substrates of medium and small gravel, with less in areas dominated by bedrock and boulder substrates.

YCWA and Relicensing Participants consulted regarding the results of the study efforts and collaboratively agreed on additional analysis of the stage discharge relationship using available hydrology data and modeling as appropriate. The analysis focuses on Fremont's cottonwood (*Populus fremontii*); assumes seed dispersal for Fremont's cottonwood is from April 1 through July 15; and that the maximum stage change per day for Fremont's cottonwood seedling germination, establishment and survival is 2.5 centimeters per day (cm/day). YCWA and Relicensing Participants jointly selected three reaches for additional analysis: Our House Diversion Dam Reach (Middle Yuba River between Our House Diversion Dam and Oregon Creek), Log Cabin Diversion Dam Reach, Celestial Valley Sub-reach (Oregon Creek between Log Cabin Diversion Dam and the Middle Yuba River), and Middle/North Yuba River Reach (Yuba River between the confluence of the Middle and North Yuba rivers and New Colgate Powerhouse).

With one exception, the additional analysis indicated that the With-Project hydrology provided more days with recession rates less than 2.5 cm than the Without-Project hydrology on an annual basis. With-Project hydrology also provided more average, minimum and maximum number of consecutive days with recession rates less than 2.5 cm, and neither With- nor Without-Project provided all days between April 1 and July 15 with this recession rate or lower. For Transect 12 on the Log Cabin Diversion Dam Reach, the Without-Project hydrology provided the maximum number of consecutive days with recession rates less than 2.5 cm.

Non-Native Invasive Plants

Based on a literature review, YCWA: 1) identified possible NNIP in the study area; 2) identified locations where NNIPs were previously observed in the Project Vicinity; and 3) gathered life history information for all potential NNIP species. In addition, YCWA reviewed: 1) CDFA list of rated species (2011); 2) the USDA, Natural Resources Conservation Service (NRCS) list (2009); 3) the California Invasive Plant Council (Cal-IPC) database (2006); and 4) PNF and TNF NNIPs and other invasive species of concern (Forest Service 2010b, e). Based on these sources, 35 NNIPs and other invasive species of concern to the Forest Service have a reasonable potential to occur within the FERC Project Boundary. Table 3.3.4-3 lists NNIPs and other species of concern to the Forest Service potentially occurring in the Project Vicinity.

Table 3.3.4-3. Non-native invasive plants and other invasive species of concern to the Forest Service potentially occurring in the Project Vicinity.

Species		CDFA Status ²	Flowering Period	Elevation (ft)	Habitat
Common Name	Scientific Name ¹				
Russian knapweed	<i>Acroptilon repens</i> [<i>Centaurea repens</i>]	B	May-Sep	Below 6,200	Fields, roadsides, cultivated ground, disturbed areas
barbed goat grass	<i>Aegilops triuncialis</i>	B	May-Aug	Below 3,300	Disturbed sites, cultivated fields, roadsides
tree of heaven	<i>Ailanthus altissima</i>	C	May-Jul	Below 6,100	Disturbed areas, roadsides, and urban waste areas
giant reed	<i>Arundo donax</i>	B	Mar-Nov	Below 1,700	Riparian areas, floodplains, and ditches
cheat grass	<i>Bromus tectorum</i>	Not rated	May-Jun	Below 6,000	Fields, roadsides, cultivated ground, disturbed areas
plumeless thistle	<i>Carduus acanthoides</i>	A	May-Aug	Below 4,300	Roadsides, pastures, waste areas
musk thistle	<i>Carduus nutans</i>	A	Jun-Jul	330-4,000	Roadsides, pastures, waste areas
Italian thistle	<i>Carduus pycnocephalus</i> <i>ssp. pycnocephalus</i>	C	May-Jul	Below 3,300	Roadsides, pastures, waste areas
woolly distaff thistle	<i>Carthamus lanatus</i>	B	Jul-Aug	Below 3,600	Disturbed sites
purple star-thistle	<i>Centaurea calcitrapa</i>	B	Jul-Oct	Below 3,300	Disturbed areas
diffuse knapweed	<i>Centaurea diffusa</i>	A	Jun-Sep	Below 7,600	Fields, roadsides
spotted knapweed	<i>Centaurea maculosa</i>	A	Jul-Aug	Below 8,500	Open disturbed sites, grasslands, forested areas, roadsides
Maltese star-thistle	<i>Centaurea melitensis</i>	C	Apr-Jul	Below 7,200	Open disturbed sites, grasslands, roadsides, waste places
yellow star-thistle	<i>Centaurea solstitialis</i>	C	Jun-Dec	Below 4,300	Pastures, roadsides, disturbed grassland or woodland
skeleton weed	<i>Chondrilla juncea</i>	A	May-Dec	Below 2,000	Disturbed areas
Canada thistle	<i>Cirsium arvense</i>	B	Jun-Sep	Below 5,900	Disturbed areas
Bermuda grass	<i>Cynodon dactylon</i>	C	Jun-Aug	Below 3,000	Disturbed areas
Scotch broom	<i>Cytisus scoparius</i>	C	Mar-Jun	Below 3,300	Disturbed areas
Medusahead grass	<i>Elymus caput-medusae</i> [<i>Taeniatherum caput-medusae</i>]	C	Apr-Jul	Below 6,900	Disturbed sites, grassland, openings in oak woodlands and chaparral
oblong spurge	<i>Euphorbia oblongata</i>	B	Apr-Aug	Below 3,300	Waste areas, disturbed sites, roadsides, fields
Japanese knotweed	<i>Fallopia japonica</i>	B	Aug-Oct	Below 3,300	Disturbed areas
Sakhalin knotweed, giant knotweed	<i>Fallopia sachalinensis</i>	B	Jul-Oct	Below 1,650	Disturbed areas
French broom	<i>Genista monspessulana</i>	C	Mar-May	Below 1,600	Disturbed areas
English Ivy	<i>Hedera helix</i>	Not rated	Autumn	Below 3,300	Disturbed forests, woodlands, and riparian areas
hydrilla	<i>Hydrilla verticillata</i>	A	Jun-Aug	Below 650	Ditches, canals, ponds, reservoirs, lakes
Klamathweed	<i>Hypericum perforatum</i>	C	Jun-Sep	Below 5,000	Disturbed sites, rangeland areas and pastures, fields, roadsides, forest clearings or burned areas
Dyer's woad	<i>Isatis tinctoria</i>	B	Apr-Jun	Below 3,300	Roadsides, fields, disturbed sites
lens-podded white-top	<i>Lepidium draba</i> ssp. <i>chalepense</i>	B	Apr-Aug	Below 5,000	Disturbed, generally saline soils, fields
perennial pepperweed, tall white-top	<i>Lepidium latifolium</i>	B	Apr-Aug	Below 6,300	Beaches, tidal shores, saline soils, roadsides
dalmation toadflax	<i>Linaria genistifolia</i> ssp. <i>dalmatica</i>	A	May-Sep	Below 3,300	Disturbed places, pastures, fields
purple loosestrife	<i>Lythrum salicaria</i>	B	Jun-Sep	Below 5,300	Seasonal wetlands, ditches, cultivated fields
Eurasian water milfoil	<i>Myriophyllum spicatum</i>	C	July-Sep	Below 6,300	Fresh to brackish water, slow-moving streams
Scotch thistle	<i>Onopordum acanthium</i>	A	Jul-Sep	Below 5,300	Disturbed areas

Table 3.3.4-3. (continued)

Species		CDFA Status ²	Flowering Period	Elevation (ft)	Habitat
Common Name	Scientific Name ¹				
Himalayan blackberry	<i>Rubus armeniacus</i> [<i>Rubus discolor</i>]	Not rated	May-Sep	Below 5,300	Disturbed moist sites, fields, roadsides, riparian areas
Spanishbroom	<i>Spartium junceum</i>	Not rated	Mar-Jun	Below 2,000	Open disturbed sites, grasslands, oak woodlands, riparian corridors, open forests
gorse	<i>Ulex europaeus</i>	B	Nov-Jul	Below 1,300	Disturbed areas

Sources: CDFA 2011, DiTomaso and Healy 2007

¹ Old genus and species names are in [].

² CDFA Status:

A = Eradication, containment, rejection, or other holding action at the state-county level. Quarantine interceptions to be rejected or treated at any point in the state.

B = Eradication, containment, control, or other holding action at the discretion of the commissioner. State endorsed holding action and eradication only when found in a nursery.

C = Action to retard spread outside of nurseries at the discretion of the commissioner; reject only when found in a crop seed for planting or at the discretion of the commissioner (CDFA 2011).

In 2012, YCWA performed surveys for NNIPs, as part of Study 5.1, *Special-Status Plants* (YCWA 2012a). YCWA found 14 NNIP species, which was comprised of 507 occurrences (630 ac). NNIP species included barbed goat grass (*Aegilops triuncialis*), tree-of-heaven, cheat grass (*Bromus tectorum*), Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus*), Maltese star-thistle (*Centaurea melitensis*), yellow star-thistle (*Centaurea solstitialis*), skeleton weed (*Chondrilla juncea*), bull thistle (*Cirsium vulgare*), Bermuda grass (*Cynodon dactylon*), Scotch broom (*Cytisus scoparius*), French broom (*Genista monspessulana*), Klamathweed (*Hypericum perforatum*), Himalayan blackberry and Medusahead grass (*Elymus caput-medusae* [*Taeniatherum caput-medusae*]). Table 3.3.4-4 lists the twelve species with 240 occurrences (241 ac) that were identified on public lands.

Table 3.3.4-4. Non-native invasive plant occurrences identified on public land in the Yuba River Development Project.

Species		CDFA Status ²	Number of Occurrences on Public Land			
Common Name	Scientific Name ¹		TNF	PNF	State of California	USACE
barbed goat grass	<i>Aegilops triuncialis</i>	B	--	1 (0.01 ac)	3 (1.07 ac)	1 (0.21 ac)
cheat grass	<i>Bromus tectorum</i>	Not Rated	--	1 (0.28 ac)	--	--
Italian thistle	<i>Carduus pycnocephalus</i> ssp. <i>pycnocephalus</i>	C	--	1 (0.07 ac)	4 (0.46 ac)	--
Maltese star-thistle	<i>Centaurea melitensis</i>	C	--	--	--	1 (0.04 ac)
yellow star-thistle	<i>Centaurea solstitialis</i>	C	10 (1.77 ac)	3 (3.48 ac)	9 (4.62 ac)	2 (5.77 ac)
skeleton weed	<i>Chondrilla juncea</i>	A	1 (0.03 ac)	1 (0.73 ac)	5 (0.24 ac)	1 (0.01 ac)
Bermuda grass	<i>Cynodon dactylon</i>	C	9 (20.94 ac)	11 (4.87 ac)	6 (2.24 ac)	1 (0.01 ac)
Scotch broom	<i>Cytisus scoparius</i>	C	15 (22.59 ac)	10 (2.62 ac)	--	--
Medusahead grass	<i>Elymus caput-medusae</i> [<i>Taeniatherum caput-medusae</i>]	C	--	2 (0.61 ac)	2 (0.49 ac)	1 (0.95 ac)
French broom	<i>Genista monspessulana</i>	C	3 (0.36 ac)	--	--	--
Klamathweed	<i>Hypericum perforatum</i>	C	5 (0.33 ac)	--	4 (1.11 ac)	--

Table 3.3.4-4. (continued)

Species		CDFA Status ²	Number of Occurrences on Public Land			
Common Name	Scientific Name ¹		TNF	PNF	State of California	USACE
Himalayan blackberry	<i>Rubus armeniacus</i> [<i>Rubus discolor</i>]	Not Rated	79 (76.17 ac)	46 (88.77 ac)	1 (0.02 ac)	--
subtotal			122 (122.19 ac)	76 (101.33 ac)	34 (10.25 ac)	7 (6.99 ac)
Total			240 (240.88 ac)			

¹ Old genus and species names are in [].

² CDFA Status:

A = Eradication, containment, rejection, or other holding action at the state-county level. Quarantine interceptions to be rejected or treated at any point in the state.

B = Eradication, containment, control, or other holding action at the discretion of the commissioner. State endorsed holding action and eradication only when found in a nursery.

C = Action to retard spread outside of nurseries at the discretion of the commissioner; reject only when found in a crop seed for planting or at the discretion of the commissioner (CDFA 2011).

Himalayan blackberry, Scotch broom, and yellow star-thistle were the most common NNIP species, ubiquitous throughout the existing FERC Project Boundary. Bermuda grass is also common, occurring in a thin band around New Bullards Bar Reservoir just below the NMWSE and along roads within the study area. For the other eight NNIP species located, 37 occurrences were found. Fifteen of the occurrences were found on lands managed by the TNF or PNF, 18 occurrences were found on lands managed by the State of California, and four occurrences were found on lands managed by the USACE.

3.3.4.1.2 Wildlife Resources

Wildlife resources are discussed in four areas: 1) special-status, CESA-listed and Fully Protected (CFP) wildlife with the potential to occur in the Project Area;¹⁰ 2) YCWA's Bald Eagle Study; 3) YCWA's Bat Study; and 4) general, special-status, CESA-listed and CPF wildlife occurrences.

Special-Status, CESA-Listed, and Fully Protected Wildlife with the Potential to, or Known to Occur in the Project Area

In 2012, YCWA performed an analysis of wildlife habitats in order to determine the presence and distribution of special-status wildlife species within and adjacent to (within 0.25 mi) the existing FERC Project boundary.¹¹ The analysis included a query of federal and state databases;¹² consultation with Cal Fish and Wildlife, USFWS and Forest Service staff. Additional information obtained from the Forest Service and YCWA in 2013 was used to update the special-status species list that resulted from YCWA's 2012 analysis. YCWA also performed two studies that focused on wintering and nesting bald eagles and the presence and distribution

¹⁰ For the purpose of Exhibit E, a "special-status wildlife species" is considered one that is: 1) found on NFS land and designated as USFS-S or a Management Indicator Species (MIS); 2) listed under the federal Endangered Species Act as a Proposed or Candidate for listing; 3) designated by Cal Fish and Wildlife as a Species of Special Concern; 4) listed under CESA as threatened or endangered, 5) classified as Fully Protected by the State of California; or 6) formally listed by the USFWS as a Bird of Conservation Concern (BCC).

¹¹ Given the 0.25 mi buffer, the analysis of wildlife habitat also included the proposed FERC Project Boundary.

¹² Federal and state databases queried include: 1) USFWS Birds of Conservation Concern (USFWS 2008); 2) California Wildlife Habitat Relationship system program (CDFG 2010a); and 3) California Natural Diversity Database (CDFG 2009a).

of special-status bats within and adjacent to the existing FERC Project Boundary (YCWA 2012c, d).

YCWA's wildlife habitat analysis identified 57 special-status wildlife species, which included one reptile, 42 birds and 14 mammals. These species are listed in Table 3.3.4-5, along with their status and known occurrences within 0.25 mi of the Project.

Table 3.3.4-5. Special-status, CESA-listed and fully protected wildlife with the potential to occur, or known to occur within 0.25 mi of the existing FERC Project Boundary.

Species		Status ¹	Occurrence Information
Common Name	Scientific Name		
REPTILES			
Coast horned lizard	<i>Phrynosoma blainvillii</i>	FSS & SSC	--
BIRDS			
Bank swallow	<i>Riparia riparia</i>	CT	--
Bald eagle	<i>Haliaeetus leucocephalus</i>	FSS, CE, CFP & BCC	New Bullards Bar Reservoir – More than 650 historic occurrences; one active nesting territory that has fledged 20 bald eagles since 1989; a second nest was reported in 2011, but its occupancy status remains unknown; in 2012 three winter night roosts and 11 hunting perches were documented (YCWA 2012c). Colgate Powerhouse – Two foraging adults observed December 2011 (YCWA 2012c).
Golden eagle	<i>Aquila chrysaetos</i>	CFP & BCC	New Bullards Bar Reservoir – 3 occurrences (TNF 2009, PNF 2013)
American peregrine falcon	<i>Falco peregrinus anatum</i>	CFP & BCC	Two occurrence in the vicinity of New Bullards Bar Dam (Forest Service 2013), One occurrence in the vicinity of Narrows 2 Powerhouse (T. Herman, pers. comm., 2013)
Great gray owl	<i>Strix nebulosa</i>	FSS & CE	Log Cabin Diversion Dam and access road (M. Tierney, pers comm. 2010)
Greater sandhill crane	<i>Grus canadensis tabida</i>	FSS, CT & CFP	--
Swainson’s hawk	<i>Buteo swainsoni</i>	FSS, CT & BCC	--
White-tailed kite	<i>Elanus leucurus</i>	CFP	--
Willow flycatcher	<i>Empidonax traillii</i>	FSS, CE & BCC	--
American white pelican	<i>Pelecanus erythrorhynchos</i>	SSC	--
Redhead	<i>Aythya americana</i>	SSC	--
Northern goshawk	<i>Accipiter gentilis</i>	FSS & SSC	Two occurrences at New Bullards Bar Reservoir and one Protected Activity Center (PAC) within 0.25 mi of Slate Creek inflow to New Bullards Bar Reservoir (Forest Service 2013)
Blue grouse	<i>Dendragapus obscurus</i>	MIS	--
Oregon vesper sparrow	<i>Poocetes gramineus affinis</i>	SSC & BCC	--
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SSC	--
Fox sparrow	<i>Passerella iliaca</i>	MIS	--
Olive-sided flycatcher	<i>Contopus cooperi</i>	SSC & BCC	--
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	SSC	--
Tricolored blackbird	<i>Agelaius tricolor</i>	SSC & BCC	--
Cassin’s finch	<i>Carpodacus cassinii</i>	BCC	--
Yellow warbler	<i>Dendroica petechia</i>	MIS & SSC	--
Hairy woodpecker	<i>Picoides villosus</i>	MIS	--
Black-backed woodpecker	<i>Picoides arcticus</i>	MIS	--
Lewis woodpecker	<i>Melanerpes lewis</i>	BCC	--
Williamson’s sapsucker	<i>Sphyrapicus thyroideus</i>	BCC	--
Mountain quail	<i>Oreortyx pictus</i>	MIS	--

Table 3.3.4-5. (continued)

Species		Status ¹	Occurrence Information
Common Name	Scientific Name		
BIRDS (continued)			
California spotted owl	<i>Strix occidentalis occidentalis</i>	FSS, MIS, SSC & BCC	Occurrences and PACs adjacent to: Our House Diversion Dam and Impoundment, Lohman Ridge Diversion Tunnel, Log Cabin Diversion Dam and Impoundment, Camptonville Diversion Tunnel, New Bullards Bar Reservoir, Colgate Powerhouse and Switchyard, Schoolhouse Family Campground, Hornswoggle Group Campground, Dark Day Boat Ramp, Dark Day Campground, and Day-Use Area, School House Trail (Forest Service 2009); 54 occurrences within 0.25-mi of New Bullards Bar Reservoir and along New Colgate Power Tunnel; 4 within a PACS, 4 within a Home Range Core Area (HRCA), and 1 within a Spotted Owl Habitat Area (SOHA) within 0.25-mi of New Bullards Bar Reservoir, 1 PAC and 1 HRCA along New Colgate Power Tunnel and 1 PAC and HRCA at Our House Diversion Dam (Forest Service 2009 and 2013)
Common loon	<i>Gavia immer</i>	SSC	--
Flammulated owl	<i>Otus flammeolus</i>	BCC	--
Long-eared owl	<i>Asio otus</i>	SSC	--
Short-eared owl	<i>Asio flammeus</i>	SSC	--
Calliope hummingbird	<i>Stellula calliope</i>	BCC	--
Purple martin	<i>Progne subis</i>	SSC	--
Loggerhead shrike	<i>Lanius ludovicianus</i>	SSC & BCC	--
Yellow-breasted chat	<i>Icteria virens</i>	SSC	--
Barrow’s goldeneye	<i>Bucephala islandica</i>	SSC	--
Harlequin duck	<i>Histrionicus histrionicus</i>	SSC	--
Northern harrier	<i>Circus cyaneus</i>	SSC	--
Black swift	<i>Cypseloides niger</i>	SSC & BCC	--
Vaux’s swift	<i>Chaetura vauxi</i>	SSC	--
Black tern	<i>Chlidonias niger</i>	SSC	--
Burrowing owl	<i>Athene cunicularia</i>	SSC & BCC	--
MAMMALS			
Ringtail	<i>Bassariscus astutus</i>	CFP	New Colgate Powerhouse and Switchyard, Narrows 2 Powerhouse and Switchyard (P. Wade. pers comm. 2012)
Sierra Nevada red fox	<i>Vulpes vulpes necator</i>	FSS & CT	--
American marten	<i>Martes americana</i>	FSS & MIS	--
Pacific fisher	<i>Martes pennanti</i>	FSS, SSC & FC	Historic occurrences reported adjacent to: New Bullards Bar Reservoir, New Bullards Bar Dam, and Minimum Flow Powerhouse, Penstock and Transformer, New Colgate Power Tunnel and Penstock, New Colgate Powerhouse and Switchyard, Cottage Creek Boat Ramp and Marina, Cottage Creek Campground (decommissioned), Cottage Creek Day Use Area, Dam Overlook, New Bullards Trail (YCWA 2012e)
Northern flying squirrel	<i>Glaucomys sabrinus</i>	MIS	--
Columbian black-tailed deer	<i>Odocoileus hemionus columbianus</i>	MIS	Winter and critical winter range for Downieville and Mooretown herds present at all Project facilities above Narrows 2 Powerhouse and Penstock. (YCWA 2012e)
Sierra Nevada snowshoe hare	<i>Lepus americanus tahoensis</i>	SSC	--
American badger	<i>Taxidea taxus</i>	SSC	--
Sierra Nevada mountain beaver	<i>Aplodontia rufa californica</i>	SSC	--
Western red bat	<i>Lasiurus blossevillii</i>	FSS & SSC	Our House Diversion Dam, Log Cabin Diversion Dam, Camptonville Tunnel, Dark Day Campground and Boat Ramp, below New Bullards Bar Dam , Colgate Powerhouse, and Narrows 2 Powerhouse (YCWA 2012d), two occurrences at Slate Creek inflow to New Bullards Bar Reservoir (Forest Service 2013)

Table 3.3.4-5. (continued)

Species		Status ¹	Occurrence Information
Common Name	Scientific Name		
MAMMALS (continued)			
Spotted bat	<i>Euderma maculatum</i>	SSC	Camptonville Tunnel, below New Bullards Bar Dam, Colgate Powerhouse, and Narrows 2 Powerhouse (YCWA 2012d)
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	FSS& SSC	Camptonville Tunnel ² , below New Bullards Bar Dam ² , Colgate Powerhouse, and Narrows 2 Powerhouse ² (YCWA 2012d)
Pallid bat	<i>Antrozous pallidus</i>	FSS & SSC	Camptonville Tunnel ² , below New Bullards Bar Dam ² , Colgate Powerhouse ² (YCWA 2012d)
Western mastiff bat	<i>Eumops perotis</i>	SSC	--

¹ Species status was obtained from the Cal Fish and Wildlife's Special Animals List (898 taxa) January 2011, USFWS' Birds of Conservation Concern 2008 list for Bird Conservation Region 15 (Sierra Nevada), and Forest Service's 2007a Record of Decision, Sierra Nevada Forests Management Indicator Species Amendment.

CE: State-listed as Endangered

CT: State-listed as Threatened

CFP: California Fully Protected

FSS: Forest Service Sensitive Species

MIS: Management Indicator Species

SSC: California Species of Concern

BCC: Bird of Conservation Concern

FC: Federal candidate species

² Acoustic detection is suggestive of species occurrence, but due to clutter, presence of other species or call fragmentation, identification is not absolute.

YCWA's Special-status Wildlife – Bald Eagle Study¹³



On March 11, 1967, the USFWS first listed the bald eagle as endangered under the ESA (32 FR 4001). On July 12, 1995, the bald eagle was reclassified as a federally threatened species (60 FR 36000). On July 9, 2007, the bald eagle was removed from the ESA (72 FR 37346). Within California, the bald eagle was listed as endangered on June 27, 1971 (CDFG 2000) and currently retains that status. Bald eagle is also designated as CFP by Cal Fish and Wildlife.

Bald eagle occurrences have increased throughout California from 93 breeding pairs in 1990 to 200 breeding pairs in 2006 (USFWS 2010). This increase has brought about an expansion in range from the Klamath Basin southward into the foothills of the Sierra Nevada. Bald eagles are primarily fish eating birds and as a result, are often found near water bodies such as lakes, rivers, and along the eastern and western coasts of the United States.

YCWA performed a detailed study regarding bald eagle (YCWA 2012c). The study, conducted between December 2011 and July 2012, documented occurrences of wintering bald eagle, winter roost sites, and identification and monitoring of nesting bald eagles within 1 mi of the existing FERC Project Boundary, which also covered the proposed FERC Project Boundary.

YCWA reviewed historic records from the TNF, PNF and CNDDDB, and found records for more than 660 bald eagle occurrences around New Bullards Bar Reservoir (Forest Service 2009,

¹³ Photo source: <<http://www.birds.cornell.edu/AllAboutBirds/BirdGuide/>>.

CDFG 2012 and Forest Service 2013).¹⁴ YCWA also received nesting survey reports from the TNF that covered the period from 1989 through 2011. The nesting surveys revealed two nests, both located on New Bullards Bar Reservoir. One nest was located on Garden Point Peninsula and since 1989, has fledged 20 bald eagles. The second nest, first reported in 2011, was located on the western shore of New Bullards Bar Reservoir in the NW ¼ of Section 12, T18N/R7E. Occupancy of the second nest was not confirmed by either the TNF or YCWA.

YCWA recorded 26 bald eagle occurrences during the three wintering surveys.¹⁵ Fifteen adult and six sub-adult bald eagles were observed at New Bullards Bar Reservoir, and two adult bald eagles were observed near New Colgate Powerhouse.

As part of the wintering surveys, YCWA located three night roosts. YCWA also found one hunting perch that was occupied during all three wintering surveys. Ten additional hunting perches were found, but their use was not consistent between surveys. All roost trees and hunting perches were within 300 ft of water. The two winter roosts were located on YCWA-owned land, and the hunting perch under consistent use was located on NFS land. Of the remaining nine hunting perches, eight were located around New Bullards Bar Reservoir and scattered between YCWA-owned land and NFS land. The other hunting perch was located on private land, approximately 1,000 ft southwest of New Colgate Powerhouse on the Yuba River.

In 2012, YCWA located both historic nests at New Bullards Bar Reservoir and determined that only the Garden Point nest was occupied. On April 30, YCWA observed one nestling in the Garden Point nest. The nestling was again present during the final nesting survey on June 14. At the time of the final June survey, the nestling was estimated to be 8 to 9 weeks old.

YCWA's Special-Status Bats Study

There are 27 species of bats that occur in various habitats throughout California, ranging from the arid deserts in the southeastern corner of the state up through the coniferous forests of the Sierra Nevada. Most of California's bats are insectivorous, while a few are known to feed on nectar. Bats roost within various structures including caves, mines, rock outcroppings, trees and within human-made structures, like attics.

YCWA performed a detailed study regarding special-status bats. The study, conducted in 2012, documented the presence, distribution, and roosts of bat species at Project facilities within the existing and proposed FERC Project Boundary. To accomplish this, YCWA performed visual inspections of Project related facilities, and implemented focused surveys that included: 1) mist netting; 2) acoustic monitoring; and 3) long-term-acoustic monitoring (LTAM) (YCWA 2012d).

Fourteen structures were found to have signs of bat use (e.g., presence of bats, guano or staining). Of those, 12 were restrooms associated with recreation areas, and two were Project facilities (i.e., New Colgate Administration and Shop Building, which is located within the New

¹⁴ Historic records for bald eagle from the PNF were provided after YCWA completed the 2012 study. For consistency in discussing bald eagle occurrences associated with the Project, those results are included here.

¹⁵ An occurrence is the formally documented presence of an individual animal on a specific day.

Colgate Powerhouse yard, and Narrows 2 Powerhouse). While performing focused surveys, YCWA found bats roosting at four additional structures: 1) underneath the concrete road deck above the inlet to the Camptonville Tunnel; 2) the interior of the Camptonville Tunnel; 3) the Emerald Cove Marina General Store; and 4) the New Colgate Administration and Shop Building.

Based on the initial reconnaissance, six sites were selected for focused surveys and four sites were selected for LTAM. Focused surveys were performed at: 1) Our House Diversion Dam; 2) Log Cabin Diversion Dam; 3) Dark Day Boat Launch; 4) Schoolhouse Family Campground; 5) downstream of New Bullards Bar Dam; and 6) Yuba River riparian margin immediately adjacent to the New Colgate Powerhouse Yard.¹⁶ Each of the focused survey sites was surveyed twice, with the first survey occurring between July 23 and 28, 2012, and the second survey occurring between September 3 and 8, 2012. LTAM was performed at following locations: 1) outflow of the Camptonville Tunnel; 2) downstream of New Bullards Bar Dam; 3) New Colgate Powerhouse; and 4) Narrows 2 Powerhouse. LTAM began on April 1, 2012 at the New Bullards Bar Dam, New Colgate Powerhouse and Narrows 2 Powerhouse sites. Monitoring at the outflow of the Camptonville Tunnel was delayed until July 24 because of unsafe access to the site due to high flows. Monitoring at all four sites continued through October 31, 2012.

YCWA captured 29 individual bats during focused surveys. Of those, 26 were identified to species: 19 Yuma myotis (*Myotis yumanensis*); three big brown bat (*Eptesicus fuscus*); two little brown myotis (*Myotis lucifugus*); one canyon bat (*Parastrellus hesperus*); and one fringed myotis (*Myotis thysanodes*). The three remaining individuals escaped from the mist nets prior to removal, but were identified as belonging to the genus *Myotis*. Bats were captured at all six of the focused survey sites. Yuma myotis were captured at all sites, except Our House Diversion Dam. Big brown bats were captured at Log Cabin Diversion Dam and Schoolhouse Family Campground. Little brown myotis were captured at Schoolhouse Family Campground and below New Bullards Bar Dam. A single fringed myotis and canyon bat were captured at Our House Diversion Dam.

While mist netting, YCWA used Titley Electronics™ Anabat SD1 CF bat detectors and Analook W (version 3.8) to acoustically identify five additional bat species. These species included Townsend's big-eared bat (*Corynorhinus townsendii*), spotted bat (*Euderma maculatum*), western red bat (*Lasiurus blossevillei*), hoary bat (*Lasiurus cinereus*) and western long-eared bat (*Myotis evotis*). In addition, YCWA recorded calls from bat species that were lumped into one of three groups: the 50 kilohertz (kHz) *Myotis*, which includes California myotis (*Myotis californicus*) and Yuma myotis; the 40 kHz *Myotis*, which includes western small-footed bat (*Myotis ciliolabrum*), long-legged bat (*Myotis volans*) and little brown myotis; and the 25 kHz bats, which includes pallid bat (*Antrozous pallidus*), big brown bat and silver-haired bat (*Lasionycteris noctivagans*). Species within these groups have similar call characteristics, making them difficult to identify via acoustic analysis. The presence of discriminating characteristics (e.g., social calls, or calls exceeding specific frequencies) allows distinction between species within each group. But, discriminating characteristics are not always present among recorded calls; thus, these eight species are often placed into their respective groups.

¹⁶ Due to safety concerns regarding energized equipment, mist nets could not be used within the New Colgate Powerhouse yard. Thus, YCWA selected the riparian margin between the New Colgate Powerhouse Yard and Yuba River.

Species recorded during LTAM included Townsend's big-eared bat, spotted bat, western red bat, hoary bat, western long-eared myotis, fringed myotis and canyon bat. YCWA also recorded calls from the 50 kHz *Myotis*, 40 kHz *Myotis*, and 25 kHz bats acoustic groups. All species and acoustic groups, except fringed myotis and canyon bat were recorded at all four LTAM sites. Canyon bat was recorded at New Bullards Bar Dam, Colgate Powerhouse and Narrows 2 Powerhouse. Fringed myotis were recorded at Camptonville Tunnel and Colgate Powerhouse. Calls suggestive of pallid bat (i.e., calls that resemble pallid bat, but lack triplicate social calls) were recorded at Camptonville Tunnel and Colgate Powerhouse.

Of the 13 species identified, four are special-status species: 1) pallid bat, a Cal Fish and Wildlife Species of Special Concern (SSC) and Forest Service Sensitive (FSS); 2) Townsend's big-eared bat, SCC and FSS; 3) western red bat, SSC and FSS; and 4) spotted bat, SSC.

As part of the study, YCWA also classified structures containing signs of bat use (e.g., guano, staining or the presence of bats) as one of four roost types: 1) night; 2) day; 3) maternity; and 4) winter hibernacula. YCWA identified 17 night roosts, 12 associated with recreation area restrooms, and 5 associated with Project facilities. YCWA also identified three active day roosts. While no maternity roosts were identified, the capture of reproductive adult bats suggests that maternity roosts may be present within or adjacent to the study area. No winter hibernacula roosts were identified.

General, Special-Status, CESA-listed and Fully Protected Wildlife Occurrences

The Project Area contains 15 habitat types that are classified by the California Wildlife Habitat Relationship (CWHR) system as Annual Grasslands, Barren, Blue Oak-Foothill Pine, Blue Oak Woodland, Douglas-Fir, Lacustrine, Mixed Chaparral, Montane Chaparral, Montane Hardwood-Conifer, Montane Hardwood, Ponderosa Pine, Riverine, Sierran Mixed Conifer, Urban and Wet Meadow (CDFG 2010a). According to the CWHR, these habitats have the potential to support 345 wildlife species, of which, 25 are reptile (lizards and snakes), 243 are bird, and 77 are mammal species. Of those, 57 are species that have been designated as special-status.

Reptiles in the vicinity of the Project include western terrestrial (or mountain) garter snake (*Thamnophis elegans elegans*), western aquatic (or Sierra) garter snake (*T. couchii couchii*), common garter snake (*T. sirtalis*), western rattlesnake (*Crotalus oreganus*), western fence lizard (*Sceloporus occidentalis*), western sagebrush lizard (*S. graciosus gracilis*) and Sierra alligator lizard (*Elgaria coerulea palmeri*). These species occur in a wide variety of habitats, ranging from riverine to woodlands, forests, and grasslands. Most are active during the summer and inactive during the winter. With respect to special-status reptiles, only the coast horned lizard (*Phrynosoma blainvillii*) was predicted to occur in the vicinity of the Project, but no occurrences have been reported.

Common bird species expected to occur in the vicinity of the Project include raptors, such as red-tailed hawk (*Buteo jamaicensis*) and Cooper's hawk (*Accipiter cooperii*); songbirds, including dark-eyed junco (*Junco hyemalis*) and spotted towhee (*Pipilo maculatus*); woodpeckers, such as white-headed woodpecker (*Picoides albolarvatus*) and northern flicker (*Colaptes auratus*); and owls, including great horned owl (*Bubo virginianus*) and western screech owl (*Otus kennicottii*).

These birds are found in a variety of habitats, ranging from streamside riparian habitats and wet meadows to Sierra mixed conifer forests and hardwood dominated woodlands common at the lower elevations of the projects. Seasonally, some birds are only present between March and July for breeding, while others may be year-round residents.

Special-status bird species with documented occurrences within 0.25 mi of the Project include: American peregrine falcon (*Falco peregrinus*), golden eagle (*Aquila chrysaetos*), great gray owl (*Strix nebulosa*), northern goshawk (*Accipiter gentilis*) and California spotted owl (*Strix occidentalis occidentalis*).

In 2012, YCWA queried the CWHR system and determined that suitable American peregrine falcon nesting habitat exists within the steep and narrow North Yuba River, Middle Yuba River and mainstem Yuba River canyons. Despite the presence of nesting habitat, neither the CNDDDB, nor Forest Service had any reports of peregrine within 0.25-mi of the existing FERC Project Boundary (YCWA 2012e). However, in 2013, the Forest Service reported two sightings of American peregrine falcon in the vicinity of New Bullards Bar Dam. The first sighting was from July 2010, and the second from January 2013. The Forest Service noted that the timing of the sightings and the proximity of nesting habitat was indicative of nesting activity (Forest Service 2013). On April 10, 2013, YCWA observed a vocal adult American peregrine falcon in flight above the Narrows 2 Powerhouse. Shortly after the initial sighting, the individual was seen perched high on a cliff, located across the canyon from the powerhouse. The perch appeared to be a rock ledge with a few small shrubs. Whitewash was visible on the rock face immediately below the perch. At that time, Project operations staff indicated that they had seen two adult American peregrine falcons, and they had become increasingly vocal over the previous two weeks (T. Herman, pers comm., 2013). Based on the April 10 observation and comments from Project operations staff, YCWA believes that the perch site was in fact an active nest.

Three golden eagle occurrences have been reported in the vicinity of New Bullards Bar Reservoir (Forest Service 2009 and Forest Service 2013).

Great gray owl was not predicted to occur in the Project Area by the CWHR program, but during the March 2010 Relicensing Participants meeting, Marilyn Tierney, District Biologist for the Yuba River Ranger District of the TNF, indicated that a pair of great gray owls have established a nesting territory within 1 mi of the Log Cabin Diversion Dam impoundment and associated access road.

According to the Forest Service, two occurrences of goshawk have been reported, along with a single northern goshawk Protected Activity Center (PAC). The PAC is located near the Slate Creek inflow to New Bullards Bar Reservoir. According to the Sierra Nevada Forest Plan Amendment (SNFPA), PACs are intended to protect northern goshawk and California spotted owl by providing a buffer between a nest and potential disturbances (Forest Service 2004). For northern goshawk PACs, the buffer includes known and suspected nest stands and 200 acres of the best available forested habitat in the largest contiguous habitat patches around the nest (Forest Service 2004).

Fifty-four California spotted owl occurrences and eight California spotted owl PACs, eight Home Range Core Areas (HRCA) and one Spotted Owl Habitat Area (SOHA) exist within or adjacent to the FERC Project Boundary. For California spotted owl PACs, the buffer includes known and suspected nest stands and 300 ac of the best available forested habitat in the largest contiguous habitat patches around the nest. In addition to the establishment of a PAC for each California spotted owl nest, the Forest Service has also established a HRCA, which encompasses 1,000 ac of the best available habitat in the closest proximity to the owl activity center, including the 300-ac PAC (Forest Service 2004). Like PACs, SOHAs are blocks of habitat that are established to protect California spotted owl. However, unlike PACs, SOHAs are not restricted to a specific size (i.e., 300 ac), and the size of each is designated by the individual forest. Once a common tool in the protection of California spotted owls, SOHAs are now restricted to those portions of the Lassen National Forest, PNF and the Sierraville District of the TNF under the Herger-Feinstein Quincy Library Group Pilot Project.

Common mammal species in the vicinity of the Project, such as Columbian black-tailed deer (*Odocoileus hemionus columbianus*), black bear (*Ursus americanus*), and squirrels, such as western grey squirrel (*Sciurus griseus*), are most often associated with the forested and woodland habitats. Some of the common mammals, like black bear, are active during the spring and summer months and hibernate during the colder winter months.

Deer in the vicinity of the FERC Project Boundary are associated with migratory Columbian black-tailed deer from the Mooretown Deer Herd, the Downieville Deer Herd and non-migratory resident deer, found along the Sierra Nevada foothills (Snowden 1984, Yuba County 1985). The Mooretown Deer Herd is bounded on the north by the Middle Fork Feather River, extending southward to about the Middle Yuba River and New Bullards Bar Reservoir (Snowden 1984, Yuba County 1984). Within its northern and southern boundaries, the Mooretown Deer Herd occupies seasonal ranges that include: 1) winter range – situated between 500 and 3,800 ft in elevation; 2) intermediate range – situated between 3,800 and 4,600 ft in elevation; and 3) summer range – situated between 4,600 and 7,000 ft in elevation (Snowden 1984). The Downieville Deer Herd abuts the Mooretown Deer Herd in the vicinity of New Bullards Bar Reservoir and extends eastward along the Middle Yuba River to the Sierra Crest (Wagner and Finn 1985). New Bullards Bar Reservoir sets within winter range for the Mooretown Deer Herd and within critical winter range for the Downieville Deer Herd. The remainder of the Project, downstream of New Bullards Bar Reservoir is located within the winter range of the Mooretown Deer Herd.

The Mooretown Deer Herd is managed under the Bucks Mountain and Mooretown Deer Herds Management Plan (Snowden 1984), while the Downieville Deer Herd is managed under the Downieville and Nevada City Deer Herd Management Plan (Wagner and Finn 1985). In 1998, California developed an ecosystem wide management strategy for deer. This strategy was adopted during a workshop involving Cal Fish and Game, Forest Service and BLM that resulted in the collaborative development of a document titled, *An Assessment of Mule and Black-tailed Deer Habitats and Populations in California* (CDFG et al. 1998). The document set the ground work for management of deer on public lands administered by the BLM and Forest Service in California. Participants in the workshop adopted 11 Deer Assessment Units (DAUs), each serving as the geographical boundary for management recommendations. The boundary for each

DAU is ecosystem based. Specific issues affecting deer in each DAU are identified, along with opportunities for betterment. The Project, the Mooretown Deer Herd, and the Downieville Deer Herd are located within DAU 5 – Central Sierra Nevada.

Population estimates by Snowden (1984) show that from 1958 through 1982, the Mooretown Deer Herd population had declined. Between 1958 and 1972, the Mooretown Deer Herd averaged more than 9,000 individuals, but from 1973 through 1982, the population was estimated to be less than 7,000 individuals. The Downieville Deer Herd also saw a population decline from more than 9,000 individuals in 1960 to less than 5,000 individuals in 1982 (Wagner and Finn 1985). These declines were consistent with what was seen throughout California over the same period. The statewide decline was attributed to a, “long-term change in management of wildlands that began in the early 1900s, particularly, the move to more regulated and intensive forest management and improved fire suppression (CDFG et al. 1998).” Recent population estimates for DAU 5 show a downward trend in population from an estimated high of more than 130,000 deer in 1991, to a low of less than 60,000 in 1995 (CDFG et al. 1998).

Known occurrences of two special-status mammals have been reported in the vicinity of the Project. Ringtail (*Bassariscus astutus*) have been reported at Colgate Powerhouse and Narrows 2 Powerhouse (P. Wade. pers. comm., 2012). Pacific fisher (*Martes pennanti*) have been reported at New Bullards Bar Reservoir, New Bullards Bar Dam, Minimum Flow Powerhouse, Penstock and Transformer; New Colgate Power Tunnel and Penstock, Powerhouse and Switchyard; Cottage Creek Boat Ramp and Marina, Cottage Creek Campground (decommissioned), Cottage Creek Day Use Area, Dam Overlook; and New Bullards Trail (YCWA 2012e).¹⁷

3.3.4.2 Environmental Effects

This section includes a description of the anticipated effects of the proposed Project on terrestrial resources and YCWA’s proposed conditions to mitigate those effects. The section is divided into the following areas: 1) effects on special-status/CESA-listed plants; 2) effects on riparian habitats and wetlands; 3) effects related to the spread of noxious weeds; 4) effects on special-status/CESA-listed and fully protected wildlife; and 5) effects due to new ground-disturbing activities.

YCWA proposes 16 conditions related to special-status plant and terrestrial wildlife. Of those, six are general in nature and may be applied to any special-status plant and terrestrial wildlife species impacted by the proposed Project. A description of these six conditions is provided immediately below. The remaining 10 conditions are specific to a botanical or terrestrial wildlife resource (e.g., vegetation management, NNIP, bald eagles) or are specific to another resource area, but their application further protects terrestrial resources (e.g., Erosion and Sediment Control Plan, New Bullards Bar Floating Material Management Plan). Each of these conditions is presented with the resource they were developed to protect. Implementation of these

¹⁷The Pacific fisher occurrence was obtained from the CNDDDB, and was shown as a non-specific point with a radius that included all facilities listed.

conditions would assure that the effects of YCWA's Proposed Project on special-status plant and wildlife species would be less than significant.

The first condition, *Consult with the Forest Service Annually Regarding Project Effects on NFS Land (GEN1)*, would: 1) allow YCWA's planned activities to be efficiently coordinated to the extent possible with Forest Service activities; 2) apprise the Forest Service of YCWA's planned O&M activities on federal land; and 3) apprise YCWA of all pertinent Forest Service orders, rules and policies that might affect planned activities. YCWA will meet with the Forest Service and other agencies annually to discuss YCWA's planned Project O&M activities for that calendar year; to the extent they are known.

In the second condition, *Consult with the Forest Service Regarding New Ground Disturbing Activities on NFS Land (GEN2)*, assures that YCWA would consult with the Forest Service to: 1) discuss potential effects; 2) determine if additional information is needed to assess effects; 3) gather additional information, if needed; and 4) upon Forest Service's request, enter into an agreement to fund a reasonable portion of Forest Service's staff time to perform staff activities related to the proposed ground disturbing activity.

In the third condition, *Consult with the Forest Service Regarding New Facilities on NFS Land (GEN3)* assures that YCWA would consult with the Forest Service to develop and submit a Biological Evaluation (BE) to the Forest Service.

In the fourth condition, *Consult with the Forest Service Regarding Pesticide Use on NFS Land (GEN4)* provides that YCWA will not use pesticides or herbicides on NFS land without approval of the Forest Service.

In the fifth condition, *Review Special-status Lists and Assess Newly-listed Species Annually (GEN5)* requires that YCWA review pertinent special-status species lists (species listed under ESA as endangered or threatened, CESA as endangered, threatened, fully protected or species of special concern, Forest Service sensitive, and PNF and TNF Watch List Species), annually to identify such species. An annual review is appropriate as changes to special-status species lists are usually minor but may vary from year to year. If a species has been added to the list and has a reasonable likelihood of being directly affected by the Project and adequate information is not available to assess likely Project effects, YCWA would consult with the appropriate agencies with jurisdiction over the species to develop a study plan to assess potential Project effects, provide the plan to those agencies for review, file the plan with the Commission, and perform the study as approved by the Commission.

In the sixth condition, *Provide Environmental Training to Employees (GEN6)*, YCWA will train its operations staff annually to familiarize them with special-status species, NNIPs, and sensitive areas within the FERC Project Boundary. YCWA will direct staff to avoid disturbance to special-status plants and discourage the spread of NNIPs.

3.3.4.2.1 Effects on Special-Status Plants/CESA-listed Plants

There is evidence that some occurrences of special-status plants may be adversely affected due to Project O&M, including ground-disturbing activities, vegetation management (e.g., mechanical clearing and herbicide use) and recreation use (e.g., trampling). No CESA-listed plants were located during YCWA's study. Project O&M impacts can be found at 19 occurrences of special-status plants located on land owned by YCWA. They occur along roads, in and around recreational facilities and in areas associated with New Bullards Bar Dam and Reservoir.

In addition to the six general conditions described above, YCWA proposes one additional condition that would assure that the effects of the proposed Project on special-status plant species would be less than significant

Under YCWA's proposed Condition TR1, Integrated Vegetation Management Plan (IVMP), YCWA will use multiple measures to protect special-status plant occurrences, including flagging sensitive areas prior to vegetation management, using manual labor, where possible and surveying for special-status plants every 10 years on the Project.

3.3.4.2.2 Effects on Riparian Habitats and Wetlands

YCWA did not identify wetlands within the Project Boundary and no Project effects on wetlands are likely to occur.

YCWA identified potential stressors, which may or may not be Project induced, to the riparian habitat in Project affected reaches as NNIPs, changes in substrates from altered sediment, changes in flow timing and duration between With- and Without-Project flows, and reduced LWM recruitment. The potential effects of NNIPs are addressed in Section 3.3.4.2.3.

Changes in substrates, due to an altered sediment supply, have the potential to significantly effect the germination and distribution of riparian species due to the capillary fringe potential associated with various substrates. Capillary fringe is a zone immediately above the water table in which water is drawn upward into soil pores by forces of adhesion and surface tension. Finely textured soils tend to have greater capillary potential than coarser sands due to a wicking action that allows plant roots to use water in the soil above the ground-water depth. Capillary action is a key factor in supporting germination, as it allows plants access to water in the soils even as the water table drops (rootfollow) (Naiman 2005). Larger substrates, such as cobble, boulder and bedrock, are unlikely to provide capillary action. Changes in fine sediment input in Project-affected reaches both up- and down-stream of the Englebright Reservoir, changes in substrate size, and effects from historical disturbances in the Yuba River downstream of the Englebright Dam may affect the germination success and distribution of woody riparian species.

Changes in flow timing and inundation duration between With- and Without-Project flows may alter the distribution or abundance of woody riparian vegetation. Riparian vegetation is strongly influenced by prolonged periods of inundation, which create anoxic soil conditions and contribute to seed germination conditions. The duration and frequency of inundation influences

lateral distribution of plant species in the channel, depending on a plant's anaerobic tolerance and germination adaptations.

However, the riparian habitats within the Project-affected reaches appear healthy, based on the distribution of plants in the channel, the richness and vigor of the plants, and the full suite of age classes of woody riparian vegetation (i.e., indicates that germination is continuing to occur). The topographic sequence, or lateral stratification, in the channel is within expected parameters in Project-affected reaches, with willows and younger (shorter) trees nearer the wetted channel or accessed by lower flows. This indicates an availability of water, either through flows and/or capillary fringe which supports successful recruitment; but also indicates vegetation may be removed by peak flow events. Willows have short rooting depths, and germinating seedlings need shallow root access to water; willows and younger trees were found in high abundance near the low-flow wetted edge of most Project-affected reaches. More mature (taller) trees, as well as a greater abundance of cottonwoods, were observed in areas accessed by higher flows, generally farther from the wetted channel. Seedlings germinate in these areas following higher flows (Mahoney and Rood 1998) and grow to maturity without being scoured out of the channel, while still accessing water using deep root systems. In the Yuba River downstream of the Englebright Dam, white alder and Western sycamore provided canopy cover in the mid-ranges of flows, with rooting depths intermediate between willows and cottonwoods.

In the Yuba River downstream of the Englebright Dam, the riparian habitats tend to have simple horizontal and vertical stratification, but this appears to be a result of residual effects from historical mining or recent anthropogenic channel changes that reset riparian seral processes.

LWM has the potential to influence pool formation, increase shade and collect sediment and organic litter within streambeds (Benda and Litschert 2013). At Log Cabin and Our House Diversion Dams, most LWM is either allowed to pass through the associated diversion tunnels to New Bullards Bar Reservoir, where it is captured and burned, or it passes over the diversion dams at high flows to the downstream reaches. Field surveys indicate that in-channel LWM in the Project-affected reaches upstream of the Englebright Reservoir was typical of high gradient stream systems in the central Sierra Nevada, with the LWM stranded high, over boulders, having no apparent interaction with the stream flow. High flows can easily flush non-imbedded wood out of the channel, and the LWM pieces have little opportunity to influence channel morphology (Ruediger and Ward 1991).

Recruitment of LWM in valley streams tends to come from streamside riparian communities, as well as upstream locations, but the Yuba River downstream of Englebright Dam is limited in the amount of late seral riparian vegetation that could potentially contribute large amounts of LWM. Wood from upstream locations may pass over Englebright Dam, but may be flushed through the system, or as field surveys indicate, much of the LWM may be deposited above floodprone widths. The LWM located above floodprone is unlikely to interact with the stream flow and typical of wood transported from higher areas in the watershed, in that it has been broken into smaller pieces (Seo et al. 2010). Additionally, LWM deposited on floodplains often decay more rapidly than in an anaerobic environments, resulting in the subsequent removal of LWM pieces from the system (Seo et al. 2010).

The six general conditions and YCWA's proposed IVMP would also protect riparian vegetation.

A seventh condition, YCWA's propose Condition GS3, *Pass Sediment at Our House and Log Cabin Diversion Dams*, has the potential to enhance downstream riparian vegetation by providing substrate for nursery sites and rooting. Increased sediment downstream of diversion dams may provide fine substrates capable of providing capillary action for germinating seedlings as well as established vegetation.

An eighth condition, YCWA's propose Condition TR5, *Pass Large Woody Material at Our House and Log Cabin Diversion Dams*, provides that YCWA pass LWM downstream of diversion dams, which will require YCWA to place the material that would otherwise be disposed of in a location that will allow it to pass over the dam. Further, the condition acknowledges that implementation of the condition does not make YCWA liable for damage to bridges due to large wood.

Two proposed aquatic resource conditions have the potential to have a beneficial effect on riparian vegetation. Condition AR1, *Maintain Minimum Streamflows Below Our House Diversion Dam, Log Cabin Diversion Dam, and New Bullards Bar Dam*, provides stabilized flows at levels similar to or higher than current flows on the Our House Diversion Dam Reach and the Log Cabin Diversion Dam Reach, providing conditions for riparian growth along the streamside. The effects of the condition in New Bullards Bar Dam will have a less than significant effect on riparian vegetation, as the minimum streamflows will remain about the same during the riparian growing season.

A tenth condition, *Control Project Spills at Our House Diversion Dam* (AR2), may enhance riparian germination. The recession limb is designed to more closely follow the recession limb of a natural snow-melt hydrograph (depending on the water year type) during the growing season, which synchronizes with the dispersal of native riparian species, providing more opportunity for successful germination and establishment.

Implementation of these conditions would ensure that the proposed Project's effects on riparian resources are less than significant.

3.3.4.2.3 Effects Related to the Spread of NNIPs

NNIPs have the potential to displace native species and alter native plant community composition and function. The Proposed Project and associated O&M adversely affect vegetation by removal of vegetation around Project-related facilities and by ground disturbing activities that can promote the spread of NNIPs. YCWA routinely clears vegetation in the immediate vicinity of Project structures, including powerhouses, flumes, recreation areas and Project access roads. Clearing is performed by mechanical means (e.g., chain saws), and occurs only in those areas needed by YCWA to maintain the structure. YCWA does not use ground-disturbing equipment for vegetation clearing.

YCWA restricts vegetation removal to areas where it is mandated by law and/or necessary to maintain facilities. Although the majority of vegetation is cleared from these locations, the total

area affected represents a small portion of the overall Project. Additionally, no Project facilities are located in or around sensitive vegetation associations (e.g., wet meadows and willow); the majority of managed vegetation is comprised of common plant communities and only a small proportion of their acreage is affected. YCWA will continue the current vegetation management efforts throughout the life of the Project, however, the effects are minor (less than significant) and site-specific.

NNIPs are not necessarily related to Project O&M in riparian communities, because many seeds are spread by birds or roll downslope (DiTomaso and Healy 2007) from non-Project areas. It is important to note where NNIPs are present because they may alter and/or negatively impact riparian communities and functions.

The six proposed general conditions and TR1 described above would help limit the spread of NNIP. In particular, Condition TR1 will implement NNIP removal, monitoring, and invasive species education to further protect environmental resources by preventing the spread and reducing the occurrences of NNIP.

Implementation of these conditions would ensure that the proposed Project's effects on NNIPs are less than significant.

3.3.4.2.4 Effects on Special-Status/CESA-Listed and Fully Protected Wildlife

The following section summarizes the life history of 57 special-status wildlife species that are known to occur, or have the potential to occur within or immediately adjacent to the FERC Project Boundary. Included for each species is a description of: 1) range and preferred habitat; 2) known occurrences; and 3) Project effects. For 10 of the 57 species, YCWA has included a description of specific proposed conditions that would mitigate Project effects. These species are bald eagle, American peregrine falcon, northern goshawk, California spotted owl, ringtail, western red bat, spotted bat, Townsend's big-eared bat, pallid bat and western mastiff bat (*Eumops perotis californicus*). In addition, YCWA's proposed six general conditions may apply to all special-status wildlife.

The first condition, Annual Consultation (GEN1) is discussed above. Specifically, if during the annual consultation it is determined that the Project would have an effect on special-status wildlife, additional mitigation conditions may be developed and employed. These conditions may include, but are not limited to, implementation of LOPs for O&M or recreation activities within or adjacent to habitat important to special-status wildlife (e.g. nesting habitat for bald eagles, denning habitat for forest carnivores, or maternity roosts for bats).

The remaining conditions are discussed above and are GEN2, GEN3, GEN4, GEN5, and GEN6.

Implementation of these conditions would assure that the effects of YCWA's proposed Project on special-status wildlife species would be less than significant.

Coast horned lizard (*Phrynosoma blainvillii*)

The coast horned lizard is designated as SSC and FSS (CDFG 2011a). The coast horned lizard may be found along the Sierra Nevada foothills up to an elevation of 4,000 ft from Butte County south to Kern County. Habitat types occupied by the coast horned lizard include valley foothill hardwood, conifer, riparian and annual grasslands. This species will often burrow into loose sandy soil to escape from predators and extreme heat, or utilize logs, rocks, mammal burrows or crevices during periods of inactivity and winter hibernation (Zeiner et al. 1988 – 1990).

Based on information available from Zeiner et al. (1988 – 1990), habitat for coast horned lizard is present in the Project Area, and as a result, this species may occur. Project O&M activities that may affect coast horned lizard include ground-disturbing activities, like grading of dirt roads that lead to disturbances of habitat features (loose sandy soil, burrows, rocks or logs) necessary for escape, or winter hibernation. YCWA's query of the CNDDDB revealed no occurrences of coast horned lizard within the FERC Project Boundary. Based on an absence of known occurrences, the proposed Project is unlikely to affect coast horned lizard.

Bank swallow (*Riparia riparia*)

The bank swallow is designated as CT (CDFG 2011a). Bank swallows are neotropical migrants that arrive in California from South America in early March to breed. In July and August, bank swallows begin their migration back to South America. During the breeding period in California, they form nesting colonies that can range from 10 to 1,500 individuals, but most known colonies have 100 to 200 nesting pairs. Nests are constructed by digging small burrows into vertical banks, bluffs and cliffs made of fine-textured or sandy soils, and are located in riparian habitat along rivers, ponds lakes and the ocean. According to Cal Fish and Wildlife (CDFG 2005a), the range of the bank swallow has been reduced by 50 percent since 1900. Bank stabilization projects (use of rip-rap) and channelization of rivers have been identified as the greatest factor in the reduction of this species range. The number of breeding pairs along the Sacramento River fell from an estimated 13,170 in 1986 to a low of 4,990 in 1999. Between 1999 and 2003, the number of pairs increased to 9,590. According to the CNDDDB (CDFW 2013), the nearest known nesting colony has been reported along the Feather River, more than 15 mi from the FERC Project Boundary.

YCWA's CWHR study identified suitable nesting habitat as occurring within the FERC Project Boundary. However, since no nesting colonies are known to exist within or adjacent to the FERC Project Boundary, the Project would have no effect on the current bank swallow population in California. Bedrock and large boulders are the dominate features of the river channels within the Project Area, and channel stability is considered to be good while bank erosion hazard has been classified as low to very low (see Section 3.3.01 Geology and Soils). Therefore loss of suitable nesting habitat as a result of implementation of bank stabilization work within the FERC Project Boundary by YCWA is unlikely, since such work is unnecessary. The proposed Project will not affect bank swallow.

Bald eagle (*Haliaeetus leucocephalus*)

The bald eagle has been listed as CE, is designated as a CFP, USFWS Bird of Conservation Concern (BCC), and FSS (CDFG 2011a). The bald eagle is a large raptor with a wingspan between 6 and 8 ft and can weigh up to 14 pounds. They typically nest within 1 mi of water bodies. The bald eagle breeds and winters throughout California, except for the desert areas, and the statewide population is increasing (CDFG 2000). Most breeding in the state occurs in the northern Sierra Nevada, Cascades, and north Coast Ranges. California's breeding population is resident year-round in most areas where the climate is relatively mild (Jurek 1988). Between mid-October and December, migratory birds from areas north and northeast of California arrive in the state. Wintering populations remain through March or early April. Based on annual wintering and breeding bird surveys, it is estimated that between 100 and 300 eagles winter on the Sierra Nevada National Forests, and at least 151 to 180 pairs remain year-round to breed (Forest Service 2007). Data from statewide breeding surveys conducted since 1973 indicate that the number of breeding pairs in the state continues to increase on an annual basis (CDFG 2000). The breeding range in California expanded from portions of 8 counties in 1981 to 27 of the state's 58 counties in 2000. Breeding generally occurs from February to July, but can be initiated as early as January via courtship, pair bonding, and territory establishment. The breeding season normally ends around August 31, as the fledglings are no longer attached to their nest area.

Appendix A of the Pacific States Bald Eagle Recovery Plan lists 47 zones within the seven-state Pacific recovery area; one of the zones (Zone 28, Sierra-Nevada Mountains) includes New Bullards Bar Reservoir. At the time of its development, the Recovery Plan identified no territories at New Bullards Bar Reservoir, but indicated that three territories would be a goal (USFWS 1986). The 2007 delisting of bald eagle indicates that the USFWS Pacific States Bald Eagle Recovery Plan has been successful. At the local level, the presence of one occupied nesting territory on New Bullards Bar Reservoir indicates that the goals of the Recovery Plan have not been met. However, the discovery of a second nest at New Bullards Bar Reservoir in 2011 suggests that the number of occupied territories may be increasing.

Within the Project Area, bald eagles have had a history of protection. With one exception – woody debris disposal at New Bullards Bar Reservoir – bald eagle protection has historically been associated with Forest Service timber management on NFS land.

On April 4, 2000, in response to the Pendola Fire, the Forest Service sent a letter to YCWA and Yuba County requesting assistance on the implementation of a seasonal closure from January 1 through August 31 of Garden Valley Road and Tractor Cove, with the goal of minimizing disturbances from people and boats during the bald eagle nesting season (Forest Service 2000). As part of its request, the Forest Service stated that the Forest Service would monitor the presence/absence and fledgling dispersal from the Garden Point nest annually in order to determine if the seasonal closure could be lifted prior to August 31.

YCWA agreed to assist the Forest Service, and a closure of Garden Valley Road and Tractor Cove from January 1 through August 31 has been in place each year since 2001.¹⁸

On April 11, 2002, the TNF released a *Draft New Bullards Bar Reservoir Fish and Wildlife Management Plan*. The plan resulted from consultations between the TNF and USFWS in 1989, regarding: 1) effects of the Skyline Timber Sale, in 1997; 2) actions at New Bullards Bar Dam; and 3) the Pendola Fire Restoration Project in 2000. The plan focuses on bald eagles and California red-legged frog (*Rana aurora draytonii*) (Forest Service 2002). With respect to bald eagles, the plan identified specific guidelines for recreation, vegetation management, residential development, hydroelectric power production and reservoir maintenance, mining, site-specific recommended mitigation and action items, and annual monitoring. Each of these guidelines considers closures (i.e., generally from January 1 through August 31), as well as buffers to which the closures may be applied (Forest Service 2002).

On February 4, 2004, USFWS released its *Biological Opinion for the New Bullards Bar Reservoir Safety and Annual Maintenance Project* (BiOp). The BiOp was in response to a TNF request (October 21, 2002) for informal consultation under Section 7 of the ESA regarding the following actions: 1) disposal of woody debris accumulated in the reservoir by piling and burning; 2) removal of hazard trees along the shoreline of the reservoir; and 3) reducing ladder fuels within administrative sites around the reservoir (i.e., the Action). The species of concern in the BO were bald eagle, California-red-legged frog, Lahonton cutthroat trout (*Oncorhynchus clarki*), and the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*, VELB), all of which were listed as threatened in 2002 (USFWS 2004a). USFWS determined the action was not likely to adversely affect California-red-legged frog, Lahonton cutthroat trout and valley elderberry longhorn beetle.

However, the BiOp concluded that removal of hazard trees on the shoreline of New Bullards Bar Reservoir would likely affect bald eagle, because this would involve the removal of actual or potential perching, roosting and nesting habitat for bald eagles. To mitigate for adverse affects on bald eagles, the USFWS provided guidance to the TNF for the three actions considered under the BiOp. For the first action – removal and disposal of woody debris from New Bullards Bar Reservoir – the USFWS specified the timing, location and methods necessary for stockpiling and disposal of woody debris accumulated in the reservoir. For the second action – removal of hazard trees – the USFWS provided the following conservation measures: 1) a LOP of January 1 through August 31, or one month past fledging within 0.25 mi of the Garden Point bald eagle breeding territory; 2) a restriction of activities (e.g., burning debris, stockpiling wood, hazard tree removal and brush removal) within all expansion territories identified in the Bullards Bar Reservoir Fish and Wildlife Management Plan (Forest Service 2002); 3) protection of wintering bald eagles by restricting activities from November 15 through March 15 within 0.25-mi of the high water mark; 4) requires that prior to removal of hazard trees 15 inches in diameter at breast height (dbh) or greater, the following steps be taken: a) a Field Data Form be completed; b) update the public use map; c) snag retention standards, as identified in the Sierra Nevada Forest Plan Amendment (USFWS 2004b), be met; d) within high-use foraging sites and winter night

¹⁸ The Forest Service's commitment to monitor the Garden Point nest does not have an end date specified in the Forest Service's April 4, 2000 letter.

roosts, multiple perching structures should be maintained; and e) retain a stump height of 3 to 4 ft for felled hazard trees that are immediately adjacent to the shoreline. For the third action – maintain administrative sites – the USFWS provided the methods for reduction of mid- and lower-story hazard fuel at administrative sites (e.g., campgrounds and day use areas). The guidance provided for removal of woody debris and hazard tree removal is integrated in the Floating Material Management Plan and the Bald Eagle Management Plan, respectively.

After reviewing the Action, current status of the bald eagle, the environmental baseline for the action area, the effects of the Action, the conservation measures incorporated into the project description (outlined above), and cumulative effects, the USFWS's final opinion was that the Action is not likely to jeopardize the continued existence of the bald eagle.

Furthermore, the BiOp included an Incidental Take Statement, which specified that under the terms of Section 7(b)(4) and Section 7(o)(2) of the ESA, take that is incidental to and not intended as part of the agency action is not considered to be prohibited take under the Act, provided that such take is in compliance with this Incidental Take Statement. This statement identifies the TNF's responsibility for regulating the Action covered by the Incidental Take Statement. The details regarding amount or extent of take, effect of take, reasonable and prudent measures, terms and conditions, and reporting requirements may be found on pages 23-27 of the BiOp.

YCWA is unaware of any information indicating that Project dams, powerhouses and O&M activities adversely affect bald eagles. As part of the 2012 bald eagle nesting study, YCWA compared nesting success for the Garden Valley nest to recreational use (day use and overnight camping) at New Bullards Bar Reservoir. With this comparison, YCWA was unable to identify a connection between recreational use of New Bullards Bar Reservoir and nesting success. Furthermore, since 2001, YCWA has had an agreement with the Forest Service to assist in the closure of Garden Valley Road and Tractor Cove for the protection of the Garden Valley nest. However, as recreational use of the Project increases, the potential for disturbances to nesting bald eagles may also increase.

The proposed Project includes a condition to implement a Bald Eagle and Falcon Management Plan (TR2) designed to minimize disturbances to bald eagles. As part of the plan, YCWA will perform nesting surveys in accordance with Jackman and Jenkins (2004) and the Cal Fish and Wildlife *Bald Eagle Breeding Survey Instructions* (CDFG 1999) at five year intervals throughout the life of the license. YCWA will, in consultation with the Cal Fish and Wildlife, Forest Service and USFWS, implement a LOP for each occupied nest and will install water and land barriers and appropriate signage around known active bald eagle nests in order to delineate a buffer for the LOP. The buffer will also serve to restrict recreation activities in the vicinity of the nests. YCWA will continue to abide by the conditions prescribed in the BiOp for removal and disposal of floating debris, removal of hazard trees, and reduction of ladder fuels in administrative areas. Since YCWA proposes no changes to the Project that would reasonably affect bald eagle the proposed Project would have a less than significant effect on bald eagles.

The proposed Project also includes the implementation of the IVMP (TR1) condition which will protect bald eagles. The IVMP will ensure that LOPs will be applied, as appropriate, to protect

special-status wildlife during vegetation management activities on NFS lands within the FERC Project Boundary.

The proposed Project also includes implementation of the New Bullards Bar Floating Material Plan (GS6). The plan was developed to manage floating debris in New Bullards Bar Reservoir through stockpiling woody material in one of three coves, and disposal of such material through burning. Coves 1 and 2 are the primary and secondary coves selected for storage and disposal of woody debris, both located on the west shore of Garden Point peninsula. Cove 3 was selected to serve only as a temporary storage area until the debris could be moved to Cove 1 or 2 for disposal. YCWA will apply LOPs and protective buffers to nesting and wintering bald eagles, and expansion territories in accordance with the BiOp during management of floating material.

Implementation of these conditions would ensure that the proposed Project's effects on bald eagle are less than significant.

Golden eagle (*Aquila chrysaetos*)

The golden eagle is a CFP and BCC (CDFG 2011a). It ranges from sea level up to 11,500 ft and can be found throughout California, except the center of the Central Valley (Zeiner et al. 1988-1990). Throughout the Sierra Nevada and foothills adjacent to the Central Valley, golden eagle may be found in sparse woodlands, grasslands, savannas, lower successional forest stages, and shrubland. Cliffs, large trees, and man-made structures (e.g., electric transmission towers) with a commanding view are used for nesting.

There are three known occurrences of golden eagle at New Bullards Bar Reservoir (Forest Service 2009, 2013). None of these occurrences include nesting birds or evidence of nesting activities, which suggests that golden eagles are occasional visitors to the Project. Since golden eagles are not known to nest within or adjacent to the FERC Project Boundary, the proposed Project would not have an effect on nesting golden eagles. Furthermore, YCWA is unaware of any information that suggests Project dams, powerhouses, or O&M activities negatively affect golden eagles that may occasionally be present in the FERC Project Boundary.

American peregrine falcon (*Falco peregrinus anatum*)

The American peregrine falcon is listed as CE and designated as a CFP and BCC (CDFG 2011a). The American peregrine falcon is a medium-sized raptor with a wingspan of 3 to 3.5 ft and can weigh up to 3.3 pounds. They may be found throughout the United States, utilizing cliffs and man-made structures, such as buildings and bridges, for nesting. American peregrine falcon typically breeds at two to three years of age, and pairs are usually bonded for life. Breeding begins in early March, and clutch size ranges from three to seven eggs with an average of three to four eggs. A second clutch may be laid if eggs are destroyed or removed early in the breeding season. Incubation takes about 29 to 32 days, followed by a nestling period of 35 to 42 days. Primary prey includes birds that range in size from medium-sized passerines up to small waterfowl. American peregrine falcon uses various hunting methods, including stooping, level pursuit, and hunting on the ground.

YCWA is unaware of any information indicating that Project dams, powerhouses and O&M activities adversely affect American peregrine falcon nesting within 0.25 mi of the FERC Project Boundary. However, with the recent observations of American peregrine falcon in the vicinity of New Bullards Bar Dam and Narrows 2 Powerhouse, YCWA has proposed to implement a Bald Eagle and American Peregrine Falcon Management Plan (TR2). This plan was designed to minimize disturbances to American peregrine falcon. As part of the Plan, YCWA will, on an annual basis, identify and evaluate ground disturbing activities that have the potential to disturb American peregrine falcon. If it is determined that disturbance to could occur, YCWA will implement nesting surveys in accordance with the monitoring protocols presented in the USFWS 2003 *Monitoring Plan for the American Peregrine Falcon*. Once all nests have been located, YCWA will establish a buffer zone of 0.5 mi and a LOP around each nest to prevent disturbances to nesting birds that may result from ground disturbing activities. The LOP will remain in effect until August 15 unless nest surveys determine that an active nest is more than 0.5 mi from the activity; or until July 1 if an occupied nest is found within 0.5 mi of the activity and additional nest surveys demonstrate that the young have fledged.

As part of the proposed Project, implementation of the IVMP (TR1) will protect American peregrine falcon. The IVMP will ensure that LOPs will be applied, as appropriate, to protect special-status wildlife during vegetation management activities on NFS lands within the proposed FERC Project Boundary.

Since YCWA proposes no changes to the Project that would reasonably affect American peregrine falcon, and will implement a Bald Eagle and American Peregrine Falcon Management Plan, the proposed Project would have a less than significant effect on American peregrine falcon.

Great gray owl (*Strix nebulosa*)

The great gray owl is listed as a CE and designated as FS-S (CDFG 2011a). The great gray owl occupies pine (*Pinus* sp.) and fir (*Abies* sp.) forests adjacent to meadows between 2,460 and 7,380 ft in elevation in California (Winter 1984). This species' use of habitat is limited by the availability of nesting structures and prey. Foraging habitat in the Sierra Nevada generally includes open meadows and grasslands in forested areas. Trees along the forest edge are used for hunting perches. Openings caused by fires or timber harvest serve as foraging habitat, when vegetation is in early successional stages (Hayward 1994, Greene 1995). Greene (1995) found that sites occupied by great gray owls had greater plant cover, vegetation height, and soil moisture than sites not occupied by owls. Canopy closure was also found to be significantly larger in occupied sites than in unoccupied sites.

The diet of the great gray owl may vary locally, but consists primarily of small mammals, predominantly rodents. All available literature indicates that great gray owls in the western United States overwhelmingly select only two prey taxa: voles (*Microtus* spp.) and pocket gophers (*Thomomys* spp.). Voles prefer meadows with dense herbaceous vegetative cover. A 4-in stubble height at the end of the growing season is thought to provide suitable cover for voles (Beck 1985), although other studies suggest herbaceous heights of 12 in are preferred (Greene 1995). Gophers are predominantly subterranean, but also appear to have herbaceous cover

preferences. Great gray owls catch these mammals by breaking through their tunnels. Compaction of meadow soils may reduce the suitability of areas for gophers.

As indicated above, a pair of great gray owls has been reported to nest within 1.0 mi of the Log Cabin Diversion Dam Impoundment and access road. Project O&M activities associated with the Log Cabin Diversion Dam Impoundment include daily visits, monthly maintenance, and an annual safety inspection. On the Log Cabin Diversion Dam access road, Project O&M activities include annual surface maintenance and annual vegetation management. While no formal recreation facilities exist at the Log Cabin Diversion Dam Impoundment, the public does utilize the impoundment for fishing. Also, an active mining claim exists immediately upstream of the impoundment on Oregon Creek. These O&M and recreational activities are unlikely to affect nesting great gray owls, since they occur at Project facilities that are located outside of suitable nesting and foraging habitat. Since YCWA proposes no changes to the Project that would reasonably affect great gray owl, the proposed Project would have no effect on great gray owl.

Greater sandhill crane (*Grus canadensis tabida*)

The greater sandhill crane (*Grus canadensis tabida*) is listed as CT, designated as CFP, and is also a FSS (CDFG 2011a). The greater sandhill crane is the largest of the six subspecies of sandhill cranes. Average adult males weigh 10.5 pounds, while females average 8.4 pounds. Except for these size differences, the sexes are similar in appearance. The greater sandhill crane eats a variety of foods, but is primarily an herbivore. Historically, greater sandhill cranes nested in eastern Siskiyou County and northeastern Shasta County southward to Honey Lake in Lassen County. Presently, greater sandhill cranes nest in Lassen, Modoc, Plumas, Shasta, Sierra and Siskiyou counties.

In California, the greater sandhill crane establishes territories in wet meadows that are often interspersed with emergent marsh. California birds tend to nest in rather open habitat; however, in certain areas, they nest in association with a dense cover of bulrush (*Scirpus* spp.) and bulreed (*Typha* spp.). The last statewide breeding population study in California was conducted in 1988, and the breeding population in the state was estimated to be 276 pairs. Favorable roost sites in an abundance of cereal grain crops characterize the cranes' Central Valley wintering ground. Rice (*Oryza* spp.) is used extensively by cranes near the Butte Sink area of Butte County, and corn (*Zea mays*) is the principal food source at most other Central Valley wintering areas, particularly in the Sacramento-San Joaquin Delta near Lodi, San Joaquin County. Irrigated pastures are chosen for resting sites throughout the wintering ground. A communal roost site consisting of an open expanse of shallow water is a key feature of wintering habitat. Currently, the estimate for greater sandhill cranes within their Pacific Flyway range is between 5,000 and 6,000 individuals. This species continues to experience threats on both wintering and breeding grounds by agricultural and residential conversion of habitat, predation, human disturbance, and collisions with power lines (CDFG 2000).

YCWA's CWHR analysis predicted occurrences of greater sandhill crane in lacustrine habitat, a general habitat type that consists of agriculture ponds and general water features. Lacustrine habitat is known to exist in the Project Area, but those features important to wintering and nesting greater sandhill cranes (e.g., wet meadows, emergent marshland, cereal grain crops) are

absent from the proposed FERC Project Boundary. Since YCWA proposes no changes to the Project that would reasonably affect greater sandhill cranes, the proposed Project would have no effect on greater sandhill cranes.

Swainson's hawk (*Buteo swainsoni*)

The Swainson's hawk is listed as CT species under CESA (CDFG 2011a), as well as a FSS and BCC species. According to the California Swainson's Hawk Inventory (CDFG 2005b), Swainson's hawk inhabit the flat portions of California's Central Valley, lower elevation Great Basin in Northeastern California, Owen's Valley and portions of the Mojave Desert. Typical breeding habitat consists of trees within mature riparian forest, lone trees and oak groves, and mature roadside trees. It forages in native grasslands, lightly-grazed dryland pasture, and suitable grain or alfalfa (*Medicago sativa*) fields that are adjacent to nesting habitat. Historically, Swainson's hawks were found throughout California, except in the Sierra Nevada. The current range of Swainson's hawk, while similar to the historic range, has become fragmented and irregularly distributed. Yolo, San Joaquin and Sacramento counties are inhabited by 85 percent of the Central Valley breeding pairs (CDFG 1993). This concentration of breeding pairs is attributed to compatible land use practices (irrigated farmland, such as alfalfa). North and south of those three counties, the number of nesting pairs falls dramatically, which is likely due to incompatible crop-types such as cotton (*Gossypium* spp.), vineyards and orchards. Furthermore, no significant foothill region breeding populations have been discovered (CDFG 1993).

According to the CWHR analysis, Swainson's hawk is predicted to occur throughout most of the study area, but no occurrences have been documented. Due to its affinity toward habitats within California's Central Valley and limited migratory presence in the Sierra Nevada, Swainson's hawk is unlikely to nest within the proposed FERC Project Boundary. Since YCWA proposes no changes to the Project that would reasonable affect Swainson's hawk, the proposed Project would have no effect on Swainson's hawk.

White-tailed kite (*Elanus leucurus*)

The white-tailed kite is designated as a CFP bird (CDFG 2011a). The white-tailed kite is a common to uncommon, yearlong resident in the Sierra Nevada foothills and adjacent valley lowlands within California. The species has increased in numbers and extended its range in recent decades (Zeiner et al. 1988-1990).

The white-tailed kite feeds mostly on voles and other small, diurnal mammals, and occasionally on birds, insects, reptiles, and amphibians. They forage in undisturbed, open grasslands, meadows, farmlands, and emergent wetlands. Trees with dense canopies provide cover, and nests are usually placed near the top of dense oaks, willows, or other tree stands near foraging areas. Breeding occurs from February to October, with the peak from May to August. The average clutch is composed of four to five eggs, and the incubation period is about 28 days. Young fledge in 35 to 40 days after hatching. The female incubates eggs and broods young exclusively, while the male supplies her with food (Zeiner et al. 1988-1990).

According to the CWHR analysis, this species may occur at most of the Project facilities within the proposed FERC Project Boundary. However, white-tailed kite occurrence is most likely at, or near, Narrows 2 Powerhouse, Switchyard, and access road. Project O&M activities likely to occur near Narrows 2 Powerhouse and Switchyard include daily visits by YCWA for the operation of the facility and facility repairs (three times per week). On the Narrows 2 Access Road, Project O&M activities that may affect white-tailed kite include annual surface maintenance and vegetation management.

There are no known occurrences of white-tailed kites in the study area. Since YCWA proposes no changes to the Project that would reasonably affect white-tailed kite, the proposed Project would have no effect on white-tailed kite.

Willow flycatcher (*Empidonax traillii*)

The willow flycatcher is listed as CE, a FSS and BCC (CDFG 2011a). The willow flycatcher breeds in shrubby vegetation in meadow and riparian communities. Serena (1982), Harris et al. (1987, 1988), and Fowler et al. (1991) observed that willow flycatchers were consistently associated with meadows where high water tables resulted in standing water and riparian shrubs (specifically willow) were abundant. Various willow flycatcher researchers in the Sierra Nevada report that the shrub layer is typically 6.5 to 13 ft in height, with the lower 6.5 ft comprised of dense woody vegetation. The live foliage density is moderate to high and uniform from the ground to the shrub canopy (Valentine 1987, Sanders and Flett 1989, Bombay 1999). The mean shrub cover within willow flycatcher territories has been documented at 21,529 square feet (sq. ft.), but in some cases they use as little as 1,076 sq. ft. (Harris et al. 1987, 1988; Sanders and Flett 1989; Fowler et al. 1991; Bombay 1999).

There is usually some surface water or saturated soil within defended territories during the early part of the breeding season (Valentine 1987, Sanders and Flett 1989, Bombay 1999). Habitat selection modeling confirmed that willow flycatchers are significantly more likely to be detected at sites where the herbaceous community is consistent with high water tables and late seral conditions and riparian deciduous shrubs are abundant (Bombay 1999). Sites are also more likely to support multiple willow flycatchers and result in successful breeding efforts where riparian shrub cover in meadows increases (Bombay 1999). Other features of sites occupied by willow flycatchers - such as dominant plant species, sizes and shapes of vegetation patches, and amount and source of water (e.g., streams, oxbows, lake margins, springs and seeps) - vary widely among sites.

Green et al. (2003) define the habitat requirements of willow flycatcher in the Sierra Nevada as:

- Elevation – 88 percent of breeding willow flycatcher occur between 4,000 and 8,000 ft elevation.
- Wetness – Successful nesting territories are strongly associated with standing or flowing water or heavily saturated soils.
- Meadow size – More than 95 percent of the breeding meadows are greater than 10 ac in size, and more than 80 percent are greater than 20 ac.

- Shrub Cover – Riparian deciduous shrub coverage of 20 to 30 percent of meadow area has been suggested as a minimum for suitable habitat.
- Foliar Density – Foliar density is a measure of the riparian deciduous shrub at the 6.5 ft shrub height level, or the level of the shrub layer where actual nesting generally occurs. A foliar density of 76 percent has been suggested as representative of suitable habitat for willow flycatcher.

While the CWHR program predicted willow flycatcher may occur at New Bullards Bar Reservoir, the elevation of the reservoir is nearly 2,000 ft lower than the elevation range where most breeding occurs. Meadow size is also another factor that may limit the likelihood of occurrence in the study area with only one wet meadow (5.8 ac) identified by CWHR.

The likelihood of occurrence of willow flycatcher within or adjacent to Project facilities is extremely low based on the lack of habitat as described by Green et al. (2003). Therefore, willow flycatcher is unlikely to be affected by Project dams, powerhouses, O&M and recreation activities. Since YCWA proposes no changes to the Project that would reasonably affect willow flycatcher, the proposed Project would have no effect on willow flycatcher.

American white pelican (*Pelecanus erythrorhynchos*)

The American white pelican is designated as a SSC (CDFG 2011a). Its habitat includes rivers, lakes, reservoirs, estuaries, bays, and open marshes (NatureServe 2013). Nesting sites require flat or gently sloped topography, without shrubs or other obstructions that would impede taking flight, are free of human disturbances and usually have loose earth suitable for constructing nest-mounds (Zeiner et al. 1988 – 1990). According to Zeiner et al. (1988 – 1990) and NatureServe (2013), this species currently nests at large lakes in the Klamath Basin of Northern California. Outside of nesting season (i.e., April to August), migrant flocks are often seen throughout California.

While the Project Area does contain a large body of water (New Bullards Bar Reservoir) that may provide suitable habitat for American white pelicans, this area is outside of any known breeding areas for this species. Occurrences of American white pelicans in the Project Area are likely related to migratory flocks moving between nesting habitat in the Klamath Basin and wintering habitat elsewhere in California. Project-related activities that may affect American white pelican would most likely be related to water-based recreation activities that involve use of boats. These activities may disturb American white pelicans that utilize Project reservoirs as rest areas during migration. The proposed Project is unlikely to affect American white pelican, since there are no known occurrences of the species and YCWA has proposed no changes to the Project that would affect them.

Redhead (*Aythya americana*)

The redhead is designated as SSC (CDFG 2011a). The redhead is uncommon to locally common during the winter months from Modoc County to Mono County in eastern California in lacustrine waters, where it is a common breeder during the summer months. It can also be found in the

Central Valley, central California foothills and coastal lowlands and along the coast from Monterey County to Ventura County during the winter months. Breeding also occurs locally in the Central Valley, coastal Southern California and eastern Kern County (Zeiner et al. 1988 – 1990). Its habitat includes large marshes, lakes, lagoons, rivers and bays. Nesting sites can be found in dense bulrush or cattail (*Typha* spp.) stands that are interspersed with small areas of open water (NatureServe 2013). This species is known to lay eggs in the nest of other redheads and other duck species, as well as nests of Northern harriers (*Circus cyaneus*) (Woodin and Michot 2012). Necessary foraging habitat includes large freshwater marshes with persistent emergent vegetation (NatureServe 2013). Redheads dive for food primarily eating leaves, stems, seeds and tubers of aquatic plants with smaller amounts of aquatic insects (Zeiner et al. 1988 – 1990).

While the CWHR program predicted redhead to occur within the Project Area, none have ever been reported. Furthermore, the FERC Project Boundary is outside of California's Central Valley where breeding is known to occur. Since YCWA proposes no changes to the Project, the proposed Project is unlikely to affect redhead.

Northern goshawk (*Accipiter gentilis*)

The Northern goshawk is a SSC and FSS (CDFG 2011a). It prefers middle and higher elevation mature, dense conifer and deciduous forests. They generally select the densest stand available with a high canopy closure (60% to 95%) (NatureServe 2013). Within territories, water sources, meadows, and riparian areas are often found. Nests are constructed in large live trees (i.e., mean dbh 11 in), between 19 and 82 ft above the ground. Nests are usually on north facing slopes. Foraging habitat includes both dense forests as well as open habitat.

As presented in Table 3.3.4-5, one northern goshawk PAC is located within 0.25-mi of New Bullards Bar Reservoir near the inflow of Slate Creek. Northern goshawk is known to be sensitive to disturbances while nesting, which may result in abandonment and nest failure. Typical activities that lead to nests disturbances include vegetation management (removal of hazard trees, NNIP control, and defensible space maintenance), recreation activities (Off-Highway Vehicle [OHV] use, camping, and hiking), and facility maintenance (inspections, road grading, annual repairs and emergency repairs).

The location of two known occurrences and one PAC are more than 5 mi from any Project dam, powerhouse, or recreational facility. As a result, YCWA anticipates that ongoing Project O&M activities, as well as use of Project campgrounds, would have no affect on nesting northern goshawks.

As part of the proposed Project, YCWA includes one measure, implementation of the IVMP (TR1) which will protect Northern goshawks. The IVMP will ensure that LOPs will be applied, as appropriate, to protect special-status wildlife during vegetation management activities on NFS lands within the FERC Project Boundary.

Blue grouse (*Dendragapus obscurus*)

Blue grouse are designated as a Management Indicator Species (MIS) (Forest Service 2007). The blue grouse is primarily a solitary montane species and nests on the ground under cover of brush, branches, or other vegetation in alpine, conifer and hardwood forests. Grasslands and shrublands are also used. Breeding begins mid-April to late May. During summer months, blue grouse feed on a variety of berries, insects, flowers and leaves. Winter feeding mainly consists of needles and buds of conifers (NatureServe 2013).

Due to their affinity towards montane habitat, blue grouse has the potential to occur within or adjacent to the proposed FERC Project boundary. However, no occurrences of this species have been reported. Project-related activities that may affect blue grouse include O&M activities, such as brush clearing and recreation activities, such as hiking, within preferred habitat. Such activities have the potential to modify nesting habitat or disturb nesting birds.

Oregon vesper sparrow (*Pooecetes gramineus affinis*)

The Oregon vesper sparrow is a SSC and BCC species (CDFG 2011a). This species is a long distance migrant that breeds west of the Cascade crest in Oregon. They winter in southern United States to central Mexico. It is a ground-dwelling species, preferring dry grass fields, with some shrubs or similar structure, and is found in old fields, grasslands and cultivated crops. Shallow nests made of woven grasses are placed on the ground. Forage items include seeds of grasses, weeds, grain crops, and during breeding season, insects (Jones and Cornely 2002).

While Oregon vesper sparrow was predicted to occur within the Project Area, it is not known to breed or nest within the FERC Project Boundary. YCWA is unaware of any information that suggests Project dams, powerhouses, or O&M activities negatively affect Oregon vesper sparrow; especially since such activities and facilities are not located within preferred habitat. Since YCWA proposes no changes to the Project that would reasonably affect Oregon vesper sparrow, the proposed Project would have no effect on Oregon vesper sparrow.

Grasshopper sparrow (*Ammodramus savannarum*)

The grasshopper sparrow is designated as SSC (CDFG 2011a). The grasshopper sparrow prefers grassland habitat, but can also be found in old fields, savannahs and shortgrass prairies. During breeding season, clumped vegetation of intermediate height, interspersed in grasslands is required (NatureServe 2013). They are an uncommon and local summer resident in foothills and lowlands west of the Cascade-Sierra Nevada crest from Mendocino and Trinity County's south to San Diego County (Zeiner et al. 1988 – 1990). They arrive at nesting areas between March and June in eastern Washington, central Nevada and southern California. Departure for the wintering grounds in central California, southern Arizona and south through Mexico and Central America occurs in mid-September. The grasshopper sparrow eats insects, other small invertebrates, grain and seeds that are picked up from the ground (NatureServe 2013).

While grasshopper sparrow was predicted to occur within the Project Area, it is not known to breed or nest within the proposed Project Boundary. YCWA is unaware of any information that

suggests Project dams, powerhouses or O&M activities negatively affect grasshopper sparrow; especially since such activities and facilities are not located within preferred habitat. Since YCWA proposes no changes to the Project that would reasonably affect grasshopper sparrow, the proposed Project would have no effect on grasshopper sparrow.

Fox sparrow (*Passerella iliaca*)

Fox sparrow is designated as MIS (Forest Service 2007). Its habitat includes dense thickets in coniferous or mixed woodlands, chaparral, parks and gardens, and wooded bottomlands along creeks and rivers. Nests are constructed within 6.5 ft of the ground in shrubs and trees, or on the ground. Dense, brushy cover is required during the nesting season (NatureServe 2013). These birds are less common in winter east of the Cascade Range and Sierra Nevada (Zeiner et al. 1988 – 1990). The fox sparrow forages on the ground for seeds and may also eat invertebrates and berries. Breeding occurs in the western mountains to southern California, Nevada, Utah and Colorado. On the west coast migration is localized (NatureServe 2013).

Due to their affinity towards dense thickets in coniferous or mixed woodlands, chaparral, parks and gardens, and wooded bottomlands along creeks and rivers, fox sparrow has the potential to occur within or adjacent to the proposed FERC Project Boundary. However, no occurrences of this species have been reported. Project related activities that may affect fox sparrow include O&M activities, such as brush clearing and recreation activities, such as hiking, within preferred habitat. Such activities have the potential to modify nesting habitat or disturb nesting birds.

Olive-sided flycatcher (*Contopus cooperi*)

The olive-sided flycatcher is a SSC and BCC species (CDFG 2011a). This species is a common to uncommon summer resident in a wide variety of forest and woodland habitats below 9,000 ft throughout California. It is not found in the deserts, the Central Valley and other lowland valleys and basins (Zeiner et al. 1988 – 1990). The olive-sided flycatcher will breed at forest edges and openings such as meadows and ponds (Audubon 2013a). Nests are made of twigs, rootlets and lichens placed out near the tip of horizontal branches of trees. Its winter habitat is also forest edges and clearings where tall trees or snags are present (Altman and Sallabanks 2000). These flycatchers forage primarily by hovering or sallying forward, concentrating on prey via aerial attack. This bird is a passive searcher as well as an active pursuer. Its diet consists of mostly flying insects, with a fondness for wild honeybees and other Hymenoptera (NatureServe 2013).

Due to their affinity towards forested and woodland habitats, olive-sided flycatcher has the potential to occur within or adjacent to the proposed FERC Project Boundary. However, no occurrences of this species have been reported. Ground disturbing activities, Project O&M activities, and recreation activities, such as hiking, within and immediately adjacent to suitable nesting habitat could affect olive-sided flycatcher.

Yellow-headed blackbird (*Xanthocephalus xanthocephalus*)

The yellow-headed blackbird is designated as a SSC species (CDFG 2011a). This species breeds commonly, but locally, in fresh-water marshes of cattail, tule (*Schoenoplectus* sp.) or bulrush

east of the Cascade Range and Sierra Nevada (Zeiner et al. 1988 – 1990). Nests are basketlike structures of wet grasses, reeds and cattails woven around stems. Nests are placed within a male's territory and always overhanging the water (Twedt and Crawford 1995). During migration and winter, open, cultivated lands, pastures and fields are used. The yellow-headed blackbird feeds on insects, seeds and grain in fields, on muddy ground near water or at the water's surface during breeding season (NatureServe 2013), while foraging outside of the breeding season takes place in upland areas, eating grains and weed seeds (Twedt and Crawford 1995).

While yellow-headed blackbird was predicted to occur within the Project Area, it is not known to breed or nest within the FERC Project Boundary. YCWA is unaware of any information that suggests Project dams, powerhouses, or O&M activities negatively affect yellow-headed blackbird; especially since such activities and facilities are not located within preferred habitat. Since YCWA proposes no changes to the Project that would reasonably affect yellow-headed blackbird, the proposed Project would have no effect on yellow-headed blackbird.

Tricolored blackbird (*Agelaius tricolor*)

The tricolored blackbird is designated as a SSC and BCC (CDFG 2011a). A highly gregarious species, the tricolored blackbird can be found roosting and foraging in flocks. Colonies can sometimes be found within short distances of one another (NatureServe 2013). This species can be found in herbaceous wetland areas, as well as cropland and hedgerow habitats. Tricolored blackbirds are known to breed in fresh-water marshes, consisting of cattails, tule, bulrushes and sedges (*Carex* sp.) (NatureServe 2013). In addition to insects, tricolored blackbirds feed on seeds and grain in the fall and winter months.

As described in Section 3.3.4.2.2, wetland habitat is absent from the existing Project Boundary. The same is true for cropland and hedgerow habitats, which are also known to be used by tricolored blackbirds. As a result, tricolored blackbirds are unlikely to be present in, or affected by the Project. Furthermore, since YCWA proposes no changes to the Project that would reasonably affect the species, the proposed Project would have no effect on tricolored blackbird.

Cassin's finch (*Carpodacus cassinii*)

Cassin's finch is designated as MIS (Forest Service 2007). The Cassin's finch is found in open, coniferous forests. Breeding occurs in most of the higher montane ranges in California and regularly in the Sierra Nevada and Cascade Range (Zeiner et al. 1988 – 1990). During migration and winter this species can be found in deciduous woodlands, scrub, bushy areas, and partly open areas with scattered trees and sometimes in suburbs near mountains. Nesting occurs in conifer trees on the outer end of the limb and, occasionally, in deciduous trees and shrubs (NatureServe 2013). Cassin's finches eat seeds and buds, insects and berries, and forages high in trees or on the ground (NatureServe 2013).

Due to their affinity towards coniferous forests, Cassin's finch has the potential to occur within or adjacent to the proposed FERC Project boundary. However, no occurrences of this species have been reported. Project related activities that may affect Cassin's finch include O&M

activities, such as brush clearing, and recreation activities, such as hiking, within preferred habitat. Such activities have the potential to modify nesting habitat or disturb nesting birds.

Yellow warbler (*Setophaga petechia*)

The yellow warbler is designated as a SSC (CDFG 2011a). The yellow warbler is a migrant, found in California between April and October. Yellow warblers construct nests 2-16 ft above ground in riparian deciduous habitat along the western slope of the Sierra Nevada. These riparian deciduous habitats are comprised of cottonwoods, willows, alders, and other small trees and shrubs found in low, open-canopy woodland. This species breeds in montane shrubbery in open conifer forests. Territory occupied by yellow warbler usually contains tall trees for singing and foraging, and heavy brush in the understory for nesting (Zeiner et. al. 1988-1990). Forage consists mostly of insects and spiders taken from the upper canopy of deciduous trees and shrubs. Yellow warblers have also been known to eat berries (Zeiner et. al. 1988-1990). Brood parasitism by brown-headed cowbirds (*Molothrus ater*) is thought to be a major cause of population decline in lowland localities in recent decades (CDFG 2011b)

Due to their affinity towards riparian deciduous habitat, yellow warbler has the potential to occur within or adjacent to the FERC Project boundary. However, no occurrences of this species have been reported. Project activities that have the potential to affect yellow warbler include vegetation management, specifically removal of riparian deciduous habitats and small trees and shrubs used for nesting, as well as ground based recreational activities, such as hiking.

Hairy woodpecker (*Picoides villosus*)

Hairy woodpecker is designated as MIS (Forest Service 2007). These robin-sized woodpeckers are a common, permanent resident of mixed conifer and riparian deciduous habitats (Zeiner et al. 1988 – 1990). They can also be found in open woodlands, swamps, well-wooded towns and parks. Dense canopy is preferred with large, old trees suitable for cavity nesting (NatureServe 2013). Hairy woodpeckers are permanent residents from Alaska, across Canada and south throughout the U.S (Audubon 2013b). Females spend the entire year on breeding territory, joined in late winter by males. Nests are typically located in the dead trees or trees with heart rot. Forage consists of mainly insects, especially boring larvae, other invertebrates and some fruit and nuts (NatureServe 2013).

Due to their affinity towards mixed conifer and riparian deciduous habitats, hairy woodpecker have the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project related activities that may affect hairy woodpecker include O&M activities, such as brush clearing, and recreation activities, such as hiking within preferred habitat. Such activities have the potential to modify nesting habitat or disturb nesting birds.

Black-backed woodpecker (*Picoides arcticus*)

Black-backed woodpecker is designated as MIS (Forest Service 2007). The black-backed woodpecker can be found from western and central Alaska, south to southeastern British

Columbia and central California. An uncommon, yearlong resident from 6,000 to 9,500 ft in predominately fir and lodgepole pine (*Pinus contorta*) forests with standing dead trees from the Siskiyou Mountains, Mount Shasta and the Warner Mountains (Zeiner et al. 1988 – 1990). Black-backed woodpeckers are associated with recently burned forests. Nests are formed in excavated holes in a hard snag, (i.e., a partially dead tree); living trees with dead heartwood; and occasionally in a stump, fence post or utility pole. They forage for food by flaking bark from trees and logs with the bulk of the woodpeckers' diet consisting of wood-boring beetle (e.g., *Chalcophora* spp., *Anobium* spp., and *Lyctus* spp.) larvae and bark beetles (*Dendroctonus* spp.), occasionally eating fruit, nuts, sap and cambium (NatureServe 2013).

While black-backed woodpecker was predicted to occur within the Project Area, information from Zeiner et al. (1988-1990) indicate that the Project is located well below the preferred elevation range of this species, 2,050 ft versus 6,000 ft. YCWA is unaware of any information that suggests Project dams, powerhouses or O&M activities negatively affect black-backed woodpecker; especially since such activities and facilities are not located within preferred habitat. Since YCWA proposes no changes to the Project that would reasonably affect black-backed woodpecker, the proposed Project would have no effect on black-backed woodpecker.

Lewis's woodpecker (*Melanerpes lewis*)

Lewis's woodpecker is designated as MIS (Forest Service 2007). Lewis's woodpecker breeds locally along the eastern slopes of the Coast Ranges and in the Sierra Nevada, Warner Mountains, Klamath Mountains and in the Cascade Range (Zeiner et al. 1988 – 1990) in open forest and woodland, coniferous forests, primarily ponderosa pine, riparian woodlands and orchards. Wintering areas need storage sites for grain or mast, such as tree bark or power poles with desiccation cracks, and are found mainly from northern Oregon, southern Idaho, and central Colorado, extending into northern Mexico. Unlike other woodpeckers, Lewis's woodpecker is not morphologically adapted to excavate cavities in hard wood. They often nest in a natural cavity or an abandoned Northern flicker (*Colaptes auratus*) hole. Forage consists of emergent insects in the summer and ripe fruits and nuts in the fall and winter. They do not bore for insects, but will flycatch and glean insects from tree branches or trunks or drop from a perch to capture insects on the ground (NatureServe 2013).

Due to their affinity towards open forest and woodland, coniferous forests, primarily ponderosa pine and riparian woodlands, Lewis woodpecker has the potential to occur within or adjacent to the proposed FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect Lewis woodpecker include O&M activities, such as brush clearing and recreation activities, such as hiking, within preferred habitat. Such activities have the potential to modify nesting habitat or disturb nesting birds.

Williamson's sapsucker (*Sphyrapicus thyroideus*)

Williamson's sapsucker is designated as MIS (Forest Service 2007). Williamson's sapsuckers are fairly common to uncommon residents in coniferous forests from the Siskiyou and Trinity Mountains south through the Cascade-Sierra Nevada Range (Zeiner et al. 1988 – 1990). In migration and winter, they will also occur in lowland forest and woodlands. Nests are in tree

cavities that individuals excavate in dead or dying pine, fir, larch (*Larix* spp.) or aspen (*Populus* spp.). These woodpeckers drill holes in trees and consume sap. They will also eat insects and in the winter, fruit (NatureServe 2013).

Due to their affinity towards coniferous forests, Williamson's sapsucker has the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect Williamson's sapsucker include O&M activities, such as brush clearing, and recreation activities, such as hiking, within preferred habitat. Such activities have the potential to modify nesting habitat or disturb nesting birds.

Mountain quail (*Oreortyx pictus*)

Mountain quail is designated as MIS (Forest Service 2007). This large quail is a resident of California, Oregon, Washington and Idaho. They are found in most major montane habitats of California. A nest is built in a small depression, lined with dry grass and leaves, and hidden among protective rocks, logs and thick vegetation. Forage consists of seeds, fruits and some insects that are found on the ground (Gutiérrez and Delehanty 1999).

Due to their affinity towards montane habitat, mountain quail has the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect mountain quail include O&M activities, such as brush clearing, and recreation activities, such as hiking, within preferred habitat. Such activities have the potential to modify nesting habitat or disturb nesting birds.

California spotted owl (*Strix occidentalis occidentalis*)

The California spotted owl is a SSC, FSS and BCC and a MIS (CDFG 2011a; USFWS 2007). Typical habitat for California spotted owl is dense, diverse, multi-layered evergreen forests with open areas under the canopy. Nests are constructed on broken tree tops, cliff ledges, in natural tree cavities and often can be found using abandoned hawk nests. Foraging habitat includes areas of larger trees with canopy closures of 40 percent and greater, as well as areas characterized by multiple vegetative strata (NatureServe 2013).

As presented in Table 3.3.4-5, above, six California spotted owl PACs are located on NFS lands within 0.25 mi of the FERC Project Boundary. Of those, four are near New Bullards Bar Reservoir, one is at Our House Diversion Dam Impoundment, and one is along the New Colgate Power Tunnel. California spotted owl is known to be sensitive to disturbances while nesting, which may result in abandonment and nest failure. Typical activities that lead to nest disturbances include vegetation management (removal of hazard trees, noxious weed control, and defensible space maintenance), recreation activities (OHV use, camping and hiking) and facility maintenance (inspections, road grading, annual repairs and emergency repairs). In general, most of the Project activities are ongoing, routine and limited in duration. However, removal of hazard trees, emergency repairs and some recreation activities are not ongoing or routine and may occur in PACs, specifically those PACs located near New Bullards Bar

Reservoir. These activities are most likely to affect breeding activities if they occur during the breeding period.

As part of the proposed Project, YCWA includes one measure, the IVMP (TR1), which will ensure that LOPs are applied, as appropriate, to protect special-status wildlife during vegetation management activities on NFS lands within the FERC Project Boundary.

Common loon (*Gavia immer*)

The common loon is designated as a SSC (CDFG 2011a). The common loon breeds on remote freshwater lakes with both shallow and deep, clear water, in the northern United States and Canada (NatureServe 2013). From May to September, the common loon can be seen in estuarine and subtidal marine habitats along the California coast, but are uncommon on large, deep lakes in valley and foothills throughout the state (Zeiner et al. 1988 – 1990). Northeastern California is considered to be within the historic breeding range of this species. Courtship begins shortly after territory reoccupation and involves shared displays, including simultaneous swimming, head posturing and short dives. Many times, a nesting pair will reuse the same site the following year. Nests are nearly always built at the water's edge in a quiet, protected hidden area and made of aquatic and terrestrial vegetation. Both the male and female build the nest together over the course of a week in May or early June. In winter and during migration, they can be found on lakes, rivers, estuaries and coastlines. Some individuals will overwinter in inland lakes and rivers. Up to 80 percent of their diet is fish, while the remaining 20 percent consists of crustaceans and aquatic plants (Zeiner et al. 1988 – 1990).

While New Bullards Bar Reservoir is a deep freshwater lake, the FERC Project Boundary does not appear to be within either the current or historic breeding range of the common loon. Furthermore no occurrences of common loon or nesting have been reported within or adjacent to the FERC Project Boundary. Due to their historic absence from the FERC Project Boundary, the proposed Project is unlikely to affect common loon.

Flammulated owl (*Otus flammeolus*)

The flammulated owl is designated as a BCC (CDFG 2011a). The flammulated owl is a locally common, summer resident in a variety of habitats from ponderosa pine to red fir (*Abies magnifica*) forests. They occur in montane regions from 6,000 to 10,000 ft elevation. This small owl breeds in the North Coast and Klamath Ranges, Sierra Nevada and suitable habitats in southern California (Zeiner et al. 1988-1990). The male supplies food and protection, while the female is the chief nest-tender. They will often nest in an abandoned tree cavity in dead, large-diameter pine, Douglas-fir or aspen. Foraging mainly occurs at night and food consists of nocturnal arthropods (NatureServe 2013).

While flammulated owl was predicted to occur within the FERC Project Boundary, no occurrences have been reported. Information from Zeiner et al. (1988-1990) indicates that the Project is located well below the preferred elevation range (6,000 to 10,000 ft) of this species. YCWA is unaware of any information that suggests Project dams, powerhouses or O&M activities negatively affect flammulated owl, especially since such activities and facilities are not

located within preferred habitat. Since YCWA proposes no changes to the Project that would reasonably affect flammulated owl, the proposed Project would have no effect on flammulated owl.

Long-eared owl (*Asio otus*)

The long-eared owl is designated as a SSC (CDFG 2011a). In California, this species can be found from the Sierra Nevada foothills up to dense conifer stands at higher elevations. For roosting and nesting, long-eared owls require dense riparian and live oak thickets that contain densely canopied trees (Zeiner et al. 1988-1990). Resident populations in California have been declining since the 1940s, especially in southern California (Grinnell and Miller 1944; Remsen 1978, as cited by Zeiner et al. 1988-1990). While specific reasons for their decline is unknown, habitat fragmentation of riparian habitat and live oak groves are thought to be major factors. The long-eared owl hunts in open areas for voles and other rodents (Zeiner et al. 1988-1990).

Due to their use of a wide variety of habitats, long-eared owl has the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect long-eared owl include O&M activities, such as brush clearing, and recreation activities, such as hiking, within preferred habitat. Such activities have the potential to modify nesting habitat or disturb nesting birds.

Short-eared owl (*Asio flammeus*)

The short-eared owl is designated as a SSC (CDFG 2011a). According to Zeiner et al. (1988 – 1990), the short-eared owl inhabits open areas nearly absent of trees, such as annual grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands. Nests are depressions on dry ground that are lined with grasses, forbs, sticks and feathers, and concealed by surrounding grasses and shrubs. This species is known to breed in the coastal areas of Del Norte and Humboldt counties, the San Francisco Bay Delta, northeastern Modoc plateau, east side of the Sierra Nevada between Lake Tahoe and Inyo counties, as well as the San Joaquin Valley. The short-eared owl migrates from breeding areas in September or October to wintering areas in the Central Valley, western Sierra Nevada foothills, and along the California coast. Numbers have declined over most of the range because of destruction and fragmentation of grassland and wetland habitats, and grazing (Zeiner et al. 1988-1990).

While short-eared owl was predicted to occur within the Project Area, it is not known to breed or nest within the FERC Project Boundary. YCWA is unaware of any information that suggests Project dams, powerhouses, or O&M activities negatively affect short-eared owl; especially since such activities and facilities are not located within preferred habitat. Since YCWA proposes no changes to the Project that would reasonably affect short-eared owl, the proposed Project would have no effect on short-eared owl.

Calliope hummingbird (*Stellula calliope*)

Calliope hummingbird is designated as MIS (Forest Service 2007). The calliope hummingbird is a common to fairly common summer resident of California, breeding in the mountain ranges

throughout the state. They breed in wooded habitats from ponderosa pine and montane hardwood-conifer up through lodgepole pine, favoring montane riparian, aspen and open forests near streams. Forage habitat includes montane chaparral and wet meadow habitats. These hummingbirds feed on nectar, and small insects and spiders from flowers and foliage (Zeiner et al. 1988-1990).

Due to their use of a wide variety of habitats, the calliope hummingbird has the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect the calliope hummingbird include O&M activities, such as brush clearing, and recreation activities, such as hiking, within preferred habitat. Such activities have the potential to modify nesting habitat or disturb nesting birds.

Purple martin (*Progne subis*)

The purple martin is designated as a SSC (CDFG 2011a). It is a long distance migrant, arriving in California from South America in late March and departing by late September. This species is described by Zeiner et al. (1988 – 1990) as an uncommon to rare local summer resident of various wooded, low-elevation habitats comprised of montane hardwood, valley foothill and montane hardwood-conifer, and riparian habitats. Purple martin also occurs in coniferous habitats including closed-cone pine-cypress, ponderosa pine, Douglas-fir and redwood (*Sequoia sempervirens*). These habitats vary structurally and may be old growth, multi-layered or open, and may also have snags. Purple martin most often nest in old woodpecker cavities found in tall, old, isolated trees or snags in open forests or woodlands. However, they may utilize man-made structures, such as bridges and culverts for nesting.

Due to their use of a wide variety of habitats, purple martin has the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect purple martin include O&M activities such as brush clearing, and recreation activities, such as hiking, within preferred habitat. Such activities have the potential to modify nesting habitat or disturb nesting birds.

Loggerhead shrike (*Lanius ludovicianus*)

The loggerhead shrike is designated as a SSC and BCC (CDFG 2011a). It is a common resident and winter visitor in lowland and foothills throughout California. This species' prefers habitats that include open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper (*Juniperus* spp.), juniper, desert riparian and Joshua tree (*Yucca brevifolia*) habitats (Zeiner et. al. 1988-1990). Loggerhead shrike may often be found perched on poles, wires or fenceposts.

Due to their use of a wide variety of habitats, loggerhead shrike has the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect loggerhead shrike include O&M activities, such as brush clearing, and recreation activities, such as hiking, within preferred habitat. Such activities have the potential to modify nesting habitat or disturb nesting birds.

Yellow-breasted chat (*Icteria virens*)

The yellow-breasted chat is designated as a SSC (CDFG 2011a). It is an uncommon summer resident and migrant to coastal California and the foothills of the Sierra Nevada. This species utilizes thickets of willow and other brushy vegetation in riparian areas near watercourses for cover, and may be found up to 4,800 ft in the Sierra Nevada foothills. During migration, yellow-breasted chat may occupy riparian habitat in the lower elevations of mountains (Zeiner et al. 1988-1990). Foraging occurs in low trees and shrubs and consists of insects, spiders, berries and other fruits. Breeding occurs in early May, and continues into early August, with June seeing peak activity. Breeding normally takes place in dense shrubs along stream or river courses.

Due to their affinity towards brushy riparian habitats, yellow-breasted chat has the potential to occur within the proposed FERC Project Boundary. However, no occurrences of this species have been reported. Project activities that have the potential to affect yellow-breasted chat include vegetation management, specifically removal of dense, shrubby, riparian deciduous habitats along Project-affected water courses, as well as ground based recreational activities, such as hiking.

Barrow's goldeneye (*Bucephala islandica*)

The Barrow's goldeneye is designated as a SSC (CDFG 2011a). The Barrow's goldeneye is an uncommon winter resident along the central California coast and rare inland visitor in winter on lacustrine and riverine waters (Zeiner et al. 1988-1990). Barrow's goldeneye are often observed in large flocks. Nesting occurs near lakes or ponds surrounded by dense vegetation with nests usually found in a natural tree cavity in the same area as successive years (NatureServe 2013). They forage by diving underwater to capture prey on the bottom (Eadie et al. 2000). In fresh water, aquatic insects, crustaceans, plants, small fishes and fish eggs are eaten. Mollusks, seastars and marine worms are eaten when foraging occurs in salt water (NatureServe 2013).

While Barrow's goldeneye was predicted to occur within the FERC Project Boundary, it is not known to nest within the FERC Project Boundary. The FERC Project Boundary does not appear to be within either the current or historic breeding range of the Barrow's goldeneye. Furthermore, no occurrences of Barrow's goldeneye or nesting have been reported within or adjacent to the FERC Project Boundary. Due to their historic absence from the FERC Project Boundary, the Project is unlikely to affect Barrow's goldeneye.

Harlequin duck (*Histrionicus histrionicus*)

The harlequin duck is designated as a SSC (CDFG 2011a). The harlequin duck winters in rough, coastal waters along rocky shores or reefs (Zeiner et al. 1988-1990). Summering, non-breeders are also found in the same habitat (NatureServe 2013). Zeiner et al. (1988-1990) indicates that breeding in California is rare and most of California's wintering population migrates to breeding grounds in the northwestern United States and Canada. However, harlequin duck historically nested on large Sierra rivers from Madera to Tuolumne counties (Zeiner et al. 1988-1990). During breeding season, this duck requires swift mountain streams, which it nests on rocky islands or banks. Harlequin ducks nest in a hollow spot, often under the cover of bushes, in rock

crevices among boulders, or in a tree cavity. Their diet is almost exclusively benthic aquatic invertebrates, such as crustaceans and mollusks, retrieved by diving in strong currents (NatureServe 2013).

While the harlequin duck was predicted to occur within, or adjacent to, the FERC Project Boundary, it is not known to breed or nest within the FERC Project Boundary. The FERC Project Boundary does not appear to be within either the current or historic breeding range of the harlequin duck. Furthermore, no occurrences of harlequin duck have been reported within or adjacent to the FERC Project Boundary. Due to their historic absence from the FERC Project Boundary, the proposed Project is unlikely to affect harlequin duck.

Northern harrier (*Circus cyaneus*)

The Northern harrier is designated as a SSC (CDFG 2011a). In California, the Northern harrier ranges from sea level up to 5,700 ft and can be found in the Central Valley and Sierra Nevada. Suitable habitat for this species includes meadows, grasslands, open rangelands, desert sinks, and fresh and saltwater emergent wetlands (Zeiner et al. 1988 – 1990). According to NatureServe (2013), Northern harrier may also be found in wheat fields, ungrazed or lightly grazed pastures, and some croplands (alfalfa, grain, sugar beets [*Beta* spp.], tomatoes [*Solanum* spp.] and melons [*Benincasa* spp., *Citrullus* spp., *Cucumis* spp., *Momordica* spp.]). Nesting habitat includes shrubby vegetation along the edges of marshes, emergent wetlands or along rivers and lakes. They have been known to nest in grasslands, grain fields or on sagebrush (*Artemisia* spp.) flats several miles from water. Nests are constructed of a large mound of sticks in wet areas, or a smaller cup of grasses in drier areas (Zeiner et al. 1988 – 1990).

Due to their use of meadow, grassland and open rangeland habitats, Northern harrier have the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect northern harrier include O&M activities, such as brush clearing and road maintenance, and recreation activities, such as hiking. Such activities have the potential to modify nesting or foraging habitat and could disturb nesting birds.

Black swift (*Cypseloides niger*)

The black swift is designated as SSC and BCC (CDFG 2011a). The black swift breeds locally in the Sierra Nevada and Cascade Range (Zeiner et al. 1988 – 1990). The breeding populations in the United States make long migrations to their winter range in Central America. Nests are built of mud, mosses and algae in a cup-like structure in moist locations, behind or next to waterfalls, and wet cliffs with an unobstructed flight path. These birds feed on insects that are caught in the air, often at great heights, and can be seen foraging with other swifts at the leading edges of rainstorms (NatureServe 2013).

Due to their exclusive use of moist cliff habitat for nesting, black swift have the potential to occur within or adjacent to the FERC Project Boundary, specifically in the vicinity of Project dams where seepage occurs. However, no occurrences of this species have been reported.

Project-related activities that may affect nesting black swift include O&M activities, such as dam inspections and repairs.

Vaux's swift (*Chaetura vauxi*)

The Vaux's swift is designated as a SSC (CDFG 2011a). The Vaux's swift can be found in mature forests, but also forages and migrates over open country (NatureServe 2013). The species prefers late seral stages of coniferous and mixed deciduous/coniferous forest and is more abundant in old-growth areas than younger stands (NatureServe 2013). The multi-layered broken overstory of old-growth forest may provide easier access to aerial insects than closed, continuous canopies of younger forests (NatureServe 2013). Nests are normally found in large-diameter hollow trees, broken-top trees, or stumps. The Vaux's swift usually locates the nest near to the bottom of the nesting cavity (NatureServe 2013).

Due to their use of coniferous and mixed deciduous/coniferous forest habitats, Vaux's swift have the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect Vaux's swift include O&M activities, such as brush clearing and hazard tree removal. Such activities have the potential to modify nesting or foraging habitat and could disturb nesting birds.

Black tern (*Chlidonias niger*)

Black tern is designated as MIS (Forest Service 2007). The black tern breeds from British Columbia south to central California. Black tern can be found in fresh emergent wetlands, moist grasslands and agricultural fields. Within California, black tern are common migrants and breeders on wetlands of the northeastern plateau and in Central Valley rice farms, which serve as surrogate habitat, due to the loss of wetlands through agricultural development. Natural lakes that experience little fluctuation in water surface elevation and have fresh emergent wetlands or marsh habitat provide nesting and foraging habitat, as well. Such lakes include Lake Tahoe and Eagle Lake. Nests are built on floating vegetation located in shallow water close to open water in stands of emergent vegetation. The black tern forages by hovering above wet meadows and fresh emergent wetlands. Insects are caught in the air and plucked from water and vegetation surfaces. They will also plunge into the water for tadpoles, crayfish, small fish and small mollusks (Zeiner et. al. 1988-1990).

While the black tern was predicted to occur within the FERC Project Boundary, it is not known to nest within the proposed FERC Project Boundary. Furthermore, no occurrences of black tern have been reported within or adjacent to the FERC Project Boundary. The absence of black tern is likely due to a lack of suitable nesting habitat (i.e. fresh emergent wetlands or water bodies that experience little fluctuation in water surface elevation) within or adjacent to the proposed Project. Due to their absence and lack of suitable habitat, the proposed Project is unlikely to affect black tern.

Burrowing owl (*Athene cunicularia*)

The burrowing owl is a SSC and BCC (CDFG 2011a). A small ground dwelling owl, its habitat is associated with open grassland, open lots near human habitation, and along roadsides. Within California, the breeding range of burrowing owl includes the northeastern plateau, Central Valley, San Joaquin Valley, Imperial Valley, Mojave and Colorado deserts, the southwest corner of San Diego County, and in a few coastal counties between Los Angeles and San Francisco. Burrowing owls nest in abandoned burrows dug by small mammals, such as ground squirrels (*Spermophilus* spp.), as well as larger mammals, such as foxes (*Vulpes* spp.) and badgers (*Taxidea taxus*). If burrows are unavailable, burrowing owls may dig their own in soft soil, or utilize pipes, culverts and/or nest boxes (Zeiner et. al. 1988-1990).

While the burrowing owl was predicted to occur within the FERC Project Boundary, it is not known to breed or nest within the FERC Project Boundary. The FERC Project Boundary does not appear to be within either the current or historic breeding range of the burrowing owl. Furthermore, no occurrences of burrowing owl have been reported within or adjacent to the FERC Project Boundary. Due to their historic absence from the FERC Project Boundary, the proposed Project is unlikely to affect burrowing owl.

Ringtail (*Bassariscus astutus*)

The ringtail is designated as CFP (CDFG 2011a). Ringtail is a widely-distributed, common to uncommon, permanent resident of California. This species is nocturnal and can be found in low to mid-elevation (sea level – 5,000 ft) riparian, forest and shrub habitats in close proximity to water (<0.6 mi). Important elements of ringtail habitat include rocky areas with cliffs or crevices, hollow trees, logs and snags, all of which are used for daytime shelter. Ringtails den in rock crevices, hollow trees, logs and snags, burrows dug by other animals and remote buildings (NatureServe 2013).

Ringtail breeds between February and May, with gestation lasting between 51 and 54 days. Litters contain between 1 and 4 young, and at 60 to 100 days, young begin to forage with their mother. By the end of their first summer, young are weaned and leave their mother. Both adult and young ringtails are omnivorous, but prefer animal matter (NatureServe 2013).

YCWA has reported occurrences of ringtail inside the New Colgate and Narrows 2 powerhouses. YCWA indicated that ringtails are most often discovered in the two powerhouses during the winter. In a few instances, ringtail mortalities have been reported, which have been linked to contact with high voltage electrified components. It is suspected that ringtails are seeking warmth from these high voltage components, and when they come in contact with them, they are electrocuted. These electrocutions often result in temporary outages. In order to mitigate against mortality, YCWA has implemented exclusion measures (e.g., sealing up potential entrances). As part of the proposed Project, YCWA has developed a Ringtail Management Plan (TR3) that protects ringtail by focusing on exclusion from Project facilities. The exclusion of ringtail will prevent occupancy of Project facilities, interactions with YCWA staff and future electrocutions.

The proposed Project also includes the implementation of the IVMP (TR1) measure which will protect ringtail. The IVMP will ensure that LOPs will be applied, as appropriate, to protect special-status wildlife during vegetation management activities on NFS lands within the FERC Project Boundary.

Sierra Nevada red fox (*Vulpes vulpes necator*)

The Sierra Nevada red fox is listed as CT and designated as FSS (CDFG 2011a). Sierra Nevada red fox can be found in a variety of habitats that include alpine dwarf-shrub, wet meadow, subalpine conifer, lodgepole pine, red fir, aspen, montane chaparral, montane riparian, mixed conifer and ponderosa pine (Zeiner et al. 1988-1990). This species does not appear to require dense canopy closure (Duncan Furbearer Interagency Workgroup 1989); however, it uses forested areas in proximity to meadows, riparian areas, and brush fields (Zeiner et al. 1988-1990). Sierra Nevada red foxes use openings to a greater extent than either American martens (*Martes americana*) or Pacific fishers, possibly due to their larger size. Grinnell et al. (1937) considered the Sierra Nevada red fox to be restricted to the highest forested peaks and ridges, foraging above timberline in fall and even mid-winter. Forested habitats are used for reproduction and cover (Zeiner et al. 1988-1990). According to Schempf and White (1977; as cited by CDFG 2011b), most sightings in the Sierra Nevada are above 7,000 ft.

The diet of the Sierra Nevada red fox is composed of microtines, mice, chipmunks, woodrats (*Neotoma* spp.), ground squirrels and lagomorphs (Ingles 1965, as cited in USDA 2004b), with pika (*Ochotona princeps*) and snowshoe hare (*Lepus americanus*) apparently being important in the Sierra region (Duncan Furbearer Interagency Workgroup 1989).

Due to their use of coniferous and mixed deciduous/coniferous forest habitats, Sierra Nevada red fox have the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect the fox include recreation and O&M activities that result in ground disturbance, such as hazard tree or brush pile removal during maintenance of fire breaks along roadsides, and recreation activities, such as dispersed camping and hiking.

American marten (*Martes americana*)

The American marten is designated as FSS (CDFG 2011a). The American marten is a common to uncommon, permanent resident of the Sierra Nevada and North Coast regions. Habitats are various mixed evergreen forests with large trees and snags that include red fir, lodgepole pine, subalpine conifer, mixed conifer and Jeffery pine (*Pinus jeffreyi*) requiring more than 40 percent canopy cover. The American marten, a solitary species, is non-migratory, but may move to a lower elevation during the winter (Zeiner et. al. 1988-1990). When inactive, they will occupy a hole in a dead or living tree or stump, an abandoned squirrel nest, rock pile, burrow or conifer crown. Breeding occurs in the summer months with implantation being delayed. Young are born in a den, often in a hollow tree or rock (NatureServe 2013). The American marten is mainly carnivorous, foraging for small mammals, birds, insects and carrion. An individual may travel up to 15 mi in one night of hunting (Zeiner et. al. 1988-1990).

Due to their use of coniferous and mixed deciduous/coniferous forest habitats, American marten have the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect include O&M activities that result in ground disturbance, such as hazard tree or brush pile removal during maintenance of fire breaks along roadsides, and recreation activities such as dispersed camping and hiking.

Pacific fisher (*Martes pennanti*)

Pacific fishers are listed as FC and designated as FSS and SSC (CDFG 2011a). Pacific fishers prefer mature coniferous and deciduous-riparian habitats that contains trees of intermediate to large size with a high percent (>50%) of canopy closure (Zeiner et al. 1988 – 1990). Snags, hollow logs, protected cavities, brush piles and upturned trees are also important habitat elements, since they provide suitable den sites. It is unlikely that early and mid-successional forests, especially those that have resulted from timber harvest, provide the same prey resources, rest sites, and den sites as more mature forests (69 FR 19925-19935).

Two remnant populations, separated by a distance of 270 mi, are known to occur in California. One population is located in the southern Sierra Nevada in the vicinity of Sequoia and Kings Canyon National Park, and the other is located in the north Coast Ranges of California near the Oregon border. According to the CNDDDB, in 1987, one occurrence of Pacific fisher was reported in the FERC Project Boundary (CDFW 2013). This single occurrence overlaps with 10 Project facilities, five of which are associated with power generation (i.e., New Bullards Bar Reservoir, New Colgate Power Tunnel and Penstock, New Bullards Bar Dam and Spillway, New Bullards Bar Dam and Spillway access road, and New Bullards Bar Minimum Flow Powerhouse, Penstock and Transformer) and five are associated with recreation facilities (i.e., Cottage Creek Marina and Boat Ramp, Cottage Creek Day Use Area, Cottage Creek Campground, New Bullards Bar Trail, Dam Overlook).¹⁹ Since 1987, no additional occurrences have been reported within or adjacent to the FERC Project Boundary; and since 1995, no Pacific fisher has been reported in the Sierra Nevada outside of the southern Sierra Nevada population. Despite the 1987 and 1995 reports, a lack of detections outside of the two populations in California suggests the Pacific fisher has been extirpated or reduced to scattered individuals in the central and northern Sierra Nevada (77 FR 70010). According to a recent status review of Pacific fisher in California, there is little empirical evidence of Pacific fisher previously inhabiting the 270 mi gap between the northern and southern populations (CDFG 2010b). However, the CDFW believes that trapping reports and accounts described by Grinnell et al. (1937) suggest that as much as 43 percent of historical range is either: 1) no longer inhabited; 2) not part of historical range; or 3) Pacific fishers are extremely rare in that portion of the Sierra Nevada between the two populations (CDFG 2010b). While almost no information on distribution exists prior to Grinnell's work in the 1920's, preliminary genetic comparisons of the two California populations suggest that Pacific fishers did not continuously inhabit the 270 mi gap and likely have been separated for more than 1,000 years (CDFG 2010b). The CDFG (2010b) concluded that,

¹⁹ In order to protect Pacific fisher, the Cal Fish and Wildlife displays the location of this occurrence using a non-point specific 0.8-mi polygon that encompasses the exact location of this occurrence. It is for this reason that this single occurrence of Pacific fisher overlaps with multiple Project facilities.

“...there has not been [a] substantial change in fisher population distribution since the Grinnell period of the 1920’s, and that natural recolonization of fisher to former range in any detectable number has not occurred.”

Major threats to Pacific fisher include fragmentation or removal of key elements of habitat through vegetation management practices, such as timber harvest and fuels reduction treatments. Other potential major threats include: large stand-replacing wildfires, changes in forest composition and structure related to the effects of climate change, forest and fuels management and urban and rural development. Threats that lead to Pacific fisher mortality and injury include: collisions with vehicles, predation, rodenticides and viral borne diseases (77 FR 70010).

Due to the lack of known occurrences and the Project’s isolation from known populations in California, the proposed Project will have no effect on Pacific fisher.

Northern flying squirrel (*Glaucomys sabrinus*)

Northern flying squirrel is designated MIS (Forest Service 2007). Preferred habitats are coniferous and mixed forest with mature trees and abundant down and standing snags, but Northern flying squirrels will utilize deciduous and riparian woods (NatureServe 2013) of the Klamath, Cascade and Sierra Nevada Ranges. Most nests are located in cavities of trees or snags with some being constructed on tree branches. Occasionally, they will use a bird’s nest that they have altered. Nests are lined with bark, leaves, lichens or twigs. This squirrel is nonmigratory and active all year (Zeiner et al. 1988 – 1990). The Northern flying squirrel diet consists largely of fungi and lichens, as well as plant and animal materials, such as insects, nuts, buds, seeds and fruit. A considerable amount of time is spent on the ground foraging (NatureServe 2013), but Northern flying squirrels will also forage in trees. They also bury seeds in the ground or store food in crevices (Zeiner et al. 1988 – 1990).

Due to their use of coniferous and mixed deciduous/coniferous forest habitats, Northern flying squirrels have the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect the species include O&M activities that result in ground disturbance, such as hazard tree or brush pile removal during maintenance of fire breaks along roadsides, and recreation activities, such as dispersed camping and hiking.

Columbian black-tailed deer (*Odocoileus hemionus columbianus*)

Columbian black-tailed deer are a subspecies of mule deer (*Odocoileus hemionus*) and are designated as MIS (Forest Service 2007). Columbian black-tailed deer are wide-ranging and found throughout California. Along the west side of the Sierra Nevada, Columbian black-tailed deer are generally migratory and spend the summer months at higher elevations and winter months in the snow-free region of the Sierra Nevada foothills. Migration is quick from summer habitat to winter habitat and triggered by cold fall storms. Migration from winter habitat to summer habitat is slow and dependent upon snowmelt.

YCWA is unaware of any information indicating that Project dams, powerhouses and O&M activities adversely affect Columbian black-tailed deer. Since YCWA proposes no changes to the Project that would reasonably affect Columbian black-tailed deer, the proposed Project would have no effect on Columbian black-tailed deer.

Sierra Nevada snowshoe hare (*Lepus americanus tahoensis*)

The Sierra Nevada snowshoe hare is designated as a SSC species (CDFG 2011a). This hare is primarily found in montane riparian habitats, with thickets of alders and willows, and in stands of young conifers, interspersed with chaparral, in California. Dense cover is preferred, particularly in riparian habitats. Breeding typically occurs from mid-February to June or July. Summer food consists of grasses, forbs, sedges and low shrubs, while needles and bark of conifers, as well as leaves and twigs of willow and alder, are eaten in the winter (Zeiner et al. 1988 – 1990).

Due to their use of coniferous and mixed deciduous/coniferous forest habitats, Sierra Nevada snowshoe hare have the potential to occur within or adjacent to the FERC Project Boundary. However, no occurrences of this species have been reported. Project-related activities that may affect include O&M activities that result in ground disturbance, such as hazard tree or brush pile removal during maintenance of fire breaks along roadsides, and recreation activities, such as dispersed camping and hiking.

American badger (*Taxidea taxus*)

The American badger is designated as a SSC species (CDFG 2011a). An uncommon, but permanent resident found throughout most of California, except in the North Coast area (Zeiner et al. 1988-1990), the American badger is found most abundantly in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. This species' diet consists mostly of rodents: rats (*Rattus* spp.), mice, chipmunks, pocket gophers (*Geomyidae* family), and ground squirrels. The American badger will also take some reptiles, insects, earthworms, eggs, birds, and carrion as prey items when ground squirrel populations are low (NatureServe 2013). Seasonal dietary shifts in response to prey availability have been observed.

YCWA is unaware of any information indicating that Project dams, powerhouses and O&M activities adversely affect American badger. Since YCWA proposes no changes to the Project that would reasonably affect American badger, the proposed Project would have no effect on American badger.

Sierra Nevada mountain beaver (*Aplodontia rufa californica*)

The Sierra Nevada mountain beaver is designated as a SSC (CDFG 2011a). The mountain beaver's distribution is scattered in the Sierra Nevada with populations local and uncommon. This species occurs in dense riparian-deciduous areas, and open, brushy stages of most forest types. Montane riparian is the most typical habitat that this species utilizes in the Sierra Nevada ecosystem. The mountain beaver requires deep, friable soils for use in burrow construction and a cool, moist microclimate. The mountain beaver feeds on the vegetative parts of plants and

changes in diet reflect the protein content of available vegetation (Zeiner et al. 1988-1990). Breeding occurs from December through March, with a peak in February. Young are generally born between February and June. Birthing peaks from March until May with an average litter size of 2-3 young.

While suitable habitat is present within the FERC Project Boundary, YCWA is unaware of any information indicating that Project dams, powerhouses and O&M activities adversely affect Sierra Nevada mountain beaver. Since YCWA proposes no changes to the Project that would reasonably affect Sierra Nevada mountain beaver, the proposed Project would have no effect on Sierra Nevada mountain beaver.

Special-Status Bats

Western red bat is designated as a SSC and FSS (CDFG 2011a). The western red bat is small to medium sized bat that weigh between 10 and 15 grams (g), has a forearm length between 1.5 and 1.6 in and an ear length that is less than 0.5 in. Pelage is red with white patches at the shoulders, elbows and thumbs.

A widely distributed species, western red bat can be found in southern British Columbia, much of the western United States, Mexico, Central America, Argentina and Chile. Western red bats are often solitary and roost primarily among foliage of trees or shrubs adjacent to streams, open fields, and occasionally, in urban areas. Cave roosting has been documented at Carlsbad Caverns in southeastern New Mexico. This species migrates in groups and forages in close proximity with one another. Males and females appear to occupy different summer ranges, as well as differ in the timing of migration. Winter behavior is poorly understood, but it is believed red bats occasionally wake from hibernation on warm days to feed. Mating occurs in late summer or early fall, and females postpone pregnancy until spring. Gestation is about 80-90 days, and up to five pups may be born (WBWG 2013).

Spotted bat is designated as a SSC (CDFG 2011a). The spotted bat is a medium-sized bat, with adults weighing between 13 and 20 g and having a forearm length ranging from 1.8 to 2.0 in. They have a unique coloration that includes dorsal black fur with three white spots, a white ventral surface, and pink ears that can be almost 2 in long (WBWG 2013).

This species is found throughout the western United States, including California. Habitats include: desert-scrub, pinyon-juniper woodland, ponderosa pine, mixed conifer forest, canyon bottoms, canyon rims, riparian areas, fields and open pastures. Foraging often occurs within 32 ft of the ground, but can occur as high as 164 ft and as low as 6 ft. Moths are the primary prey of spotted bats. Spotted bats are capable of long distance flight and in Arizona, are known to travel up to 50 mi in order to feed. Preferred roosts include cracks, crevices and caves that are often located high in prominent rock features. Generally, spotted bats are solitary, but occasionally, are found roosting or hibernating in small groups. Information regarding migration is lacking, but in Arizona, they are known to be active year-round. Breeding is thought to occur in late summer, and a single pup is born the following May or June (WBWG 2013).

Townsend's big-eared bat is designated as a SSC and FSS (CDFG 2011a). The Townsend's big-eared bat is a medium sized bat, with adults weighing between 9 and 11 g and having a forearm length between 1.5 and 1.8 in. Distinguishing characteristics include a prominent, bilateral nose lump and large ears that measure more than 1.0 in long (WBWG 2013).

This species is distributed from southern British Columbia south to central Mexico. Within the United States, Townsend's big-eared bats are found from the Great Plains west through the Rocky Mountains to the Pacific Coast. Preferred habitats include coniferous forests, mixed mesophytic forests, deserts, native prairies, riparian communities, active agricultural areas and coastal habitat types. Foraging occurs along edge habitats associated with streams and wooded habitats. Townsend's big-eared bats forage almost exclusively on moths, with lepidopterans making up more than 90 percent of its diet. This species is known to travel long distances while foraging and has been reported to move more than 93 mi in a single evening. Caves and abandoned mines are primary roosting habitat, but roosts in buildings, bridges, rock crevices and hollow trees have been reported. Maternity colonies vary in size and can have a few individuals or several hundred. Mating occurs between October and February, and a single pup is born between May and June (WBWG 2013).

Pallid bat is designated as a SSC and FSS (CDFG 2011a). The pallid bat is a medium sized bat, with adults weighing between 13 and 28 g and having a forearm length between 1.7 and 2.3 in. Distinguishing characteristics include large ears that measure about 1.0 in long, a pale pelage, and a skunk-like odor (WBWG 2013).

The range of pallid bat includes western North America, between the southern interior of British Columbia and the Mexican states of Queretaro and Jalisco, and as far east as Texas. Preferred habitats include low elevation (<6,000 ft) rocky arid deserts and canyonlands, shrub-steppe grasslands, karst formations and coniferous forests above 7,000 ft. Common roosts include crevices in rocky outcrops and cliffs, caves, mines, trees and various human structures, such as bridges, barns, porches and attics. Roosts may be occupied by one or hundreds of pallid bats. Pallid bats are opportunistic generalists that primarily glean insects from surfaces, but will also capture insects in flight. Mating occurs from October to February; one or two pups are born between late April and July and weaned in August (WBWG 2013).

Western mastiff bat is designated as a SSC (CDFG 2011a). The western mastiff bat is the largest species of bat in North America, with adults weighing upwards of 65 g and having a forearm length of 2.8-3.2 in long. Size is this species' most distinguishing characteristic (WBWG 2013).

Western mastiff bats are primarily found in the southwestern United States from California east to western Texas, and as far north as southern Utah. They are found in a variety of habitats, including desert scrub, chaparral, oak woodland, ponderosa pine forests and high elevation meadows in mixed conifer forests. In California, western mastiff bats were thought to only occur below 1,200 ft, but recent surveys have found roosts as high as 4,600 ft. Roosts are generally high above the ground and allow an unobstructed drop at the roost opening of 10 ft or more. Suitable roosts include exfoliating rock slabs and crevices in large boulders and buildings. Maternity colonies typically have fewer than 100 individuals. Western mastiff bats mate between late winter and early spring, and a single pup is born in early to mid-summer. Foraging

occurs 100 to 200 ft above the ground and is typically along dry desert washes, floodplains, chaparral, oak woodland, open ponderosa pine forest, grassland and agricultural areas. Lepidoptera are primary forage for western mastiff bats, but beetles (*Coleoptera* family), crickets (*Gryllidae* family) and katydids (*Tettigoniidae* family) are also consumed (WBWG 2013).

Project facilities and disturbances associated with Project recreation have the potential to affect special-status bats. Bats are sensitive to various disturbances and can be directly, or indirectly, affected by human activities at roost sites. These disturbances may directly or indirectly result in mortality, or abandonment of roosts. In the case of maternity roosts, disturbances can lead to abandonment and loss of juveniles. Since most species of bats roost communally, disturbances to roosts have the potential to affect anywhere from one to thousands of individuals. Bat mortality, whether it is directly or indirectly related to an activity, could threaten the long-term persistence of bats, especially since fecundity is low.

Three special-status bats were detected acoustically using Titley Electronics™ Anabat SD1 CD bat detector while mist netting. Townsend's big eared-bat was detected at Dark Day Campground and Boat Ramp. Spotted bat was detected at New Colgate Powerhouse, and western red was detected at Our House Diversion Dam, Log Cabin Diversion Dam, Dark Day Campground and Boat Ramp and New Colgate Powerhouse. Four special-status bats were recorded during LTAM. Pallid bat and Townsend's big-eared bat were detected at New Colgate Powerhouse. Spotted bat and western red bat were detected at Camptonville Tunnel, New Bullards Bar Dam, New Colgate Powerhouse and Narrows 2 Powerhouse.

YCWA's proposed Project includes a measure to assure that known and future special-status bat roosts are not disturbed. While current Project O&M activities are not known to disturb special-status bat roosts, the measure would require YCWA to install humane exclusion measures at facilities where roosts are currently known and at facilities where new roosts are discovered. Exclusion measures would be installed after fall migration has occurred and before bats return in spring, and each roost will be surveyed to ensure that all bats have vacated the facility prior to installation. YCWA would not install exclusion measures where day or night roosts occur at campground restrooms that have been selected for replacement within five years of license issuance. At these locations, YCWA would implement a restroom design that is absent of suitable roosting features (i.e., sealed concrete structures lacking cavities or overhangs that may provide refuge to bats).

The proposed Project also includes the implementation of the IVMP (TR1) measure which will protect special-status bats. The IVMP will ensure that LOPs will be applied, as appropriate, to protect special-status wildlife during vegetation management activities on NFS lands within the FERC Project Boundary.

3.3.4.2.5 Effects due to New Ground-Disturbing Activities

YCWA proposes to add to the Project a TDS at New Colgate Powerhouse, a flood control outlet at New Bullards Bar Dam, and rehabilitate and enhance recreation facilities. A short description of each of the proposed activities and the anticipated effects to terrestrial resources due to these

new facilities are described below. A detailed description of these facility upgrades, anticipated construction activities, and construction schedule, may be found in Section 2.2.1.

New Colgate Powerhouse TDS

Construction of the New Colgate Powerhouse TDS is short-term - less than 5 months – and would have a very small area of disturbance (i.e., most of the work would occur within the powerhouse).

Effects on Botanical Resources

No special-status/CESA-listed plants, NNIP, riparian habitat, wetlands, or other sensitive areas are known to exist in the fenced New Colgate Powerhouse yard: all work will be confined to the powerhouse, yard and immediate vicinity.

Effects on Wildlife Resources

As described above, all construction activities will be confined to the existing New Colgate Powerhouse yard, therefore, habitats utilized by special-status wildlife will not be physically altered. Depending on the final construction schedule, noise, vehicular traffic, and the presence of construction staff could disturb neotropical birds nesting in the riparian corridor adjacent to the New Colgate Powerhouse, as well as bats roosting at the adjacent New Colgate Administration and Shop Building. Given the level of current, daily O&M activities, the increase in noise, vehicular traffic and presence of additional staff during construction is expected to be minimal and not expected to disturb nesting birds.

With respect to roosting bats, the proposed TDS and known bat roosts at the New Colgate administration and shop building are separated by a distance of more than 300 ft. Given the physical separation, construction of the TDS is unlikely to affect roosting bats.

The TDS also has the potential to affect ringtail by providing new access points to the interior of New Colgate Powerhouse during and after construction. In rare instances historically, ringtails that have accessed the interior of Project powerhouses during the winter have been electrocuted by high voltage electrified components. It is suspected that ringtails are seeking warmth from these high voltage components and when they come in contact with them, are electrocuted. These electrocutions often result in temporary outages.

Proposed Conditions

YCWA's Proposed Project includes five conditions that work to minimize and mitigate disturbance to special-status species, NNIP, riparian habitat and wetlands, and vegetative habitat. These conditions are GEN5, GEN6, G&S1, TR1, and TR3, which have been described above. Specific application of G&S1 and TR3 to TDS construction is provided below.

YCWA will implement its Erosion and Sediment Control Plan (proposed Condition GS1), which will minimize disturbance and potential transport of construction materials to riparian habitats.

YCWA has developed a Ringtail Management Plan (TR3) that protects ringtail by focusing on exclusion from Project facilities. The exclusion of ringtail will prevent occupancy of the New Colgate Powerhouse during and after construction.

New Bullards Bar Dam Flood Control Outlet

The proposed new flood control outlet will increase flood control at New Bullards Bar Dam, be located south of the existing New Bullards Bar Dam spillway centerline in the upper left abutment area of the dam and is estimated to take six years to complete.

Effects on Botanical Resources

Construction of the proposed flood control outlet at New Bullards Bar Dam will involve ground disturbance and habitat alteration. Special-status plants that have been documented within or adjacent to the flood control outlet construction area (Figure 2.2-5) include Humboldt lily, Butte County fritillary, and Brandegee's clarkia. NNIP that have been documented within or adjacent to the construction area include bull thistle, Medusahead grass, Scotch broom, Himalayan blackberry, yellow star-thistle, Bermuda grass, skeleton weed, barbed goat grass, French broom, and Italian thistle. In addition, there is riparian habitat associated with the North Yuba River just downstream of New Bullards Bar Dam. The remaining vegetative composition in and around the construction area is dominated by Ponderosa pine and Douglas fir forest, a common habitat type in the Project Vicinity. No wetlands are known to exist within the Project.

With the implementation of YCWA's proposed conditions, the effects will be less than significant. The largest threat is the spread of NNIP to new areas, including areas supporting riparian habitat or special-status plants. An additional effect includes the disturbance of special-status plants, which are located in areas that are near proposed construction areas. However there may be a slight overlap of one special-status plant occurrence (Humboldt lily occurrence 45) and the proposed construction Area 1. This overlap is minimal, and the Humboldt lily occurs in dispersed distribution so the disturbance to plants is likely to be very limited. The project conditions proposed will protect special-status plants and reduce the spread of NNIPs.

Effects on Wildlife Resources

Construction of the proposed flood control outlet at New Bullards Bar Dam will involve the use of heavy equipment, transportation and storage of excavated material, an increased in human activity, noise, and alteration of habitat. Special-status wildlife that have been documented within or adjacent to the flood control outlet construction area (Figure 2.2.5) include Pacific fisher, American peregrine falcon, bald eagle, and California spotted owl (PAC YUB0026).

Pacific fisher is unlikely to be affected by construction of the proposed flood control outlet. The project is located between two remnant fisher populations in California, the southern Sierra Nevada and northern Coast Range populations. These populations are separated by a distance of 270 mi, and since 1987, no additional occurrences have been reported within or adjacent to the FERC Project Boundary; and since 1995, no Pacific fisher has been reported in the Sierra Nevada outside of the southern Sierra Nevada population. Despite the 1987 and 1995 reports, the lack of detections outside of the two populations in California suggests the Pacific fisher has been extirpated or reduced to scattered individuals in the central and northern Sierra Nevada (77

FR 70010). According to a recent status review of Pacific fisher in California, there is little empirical evidence of Pacific fisher previously inhabiting the 270 mi gap between the northern and southern populations (CDFG 2010b). Due to its absence from the Project Area and believed extirpation outside of the two remnant populations, construction of the proposed flood control outlet will have no effect on Pacific fisher.

Reports by the Forest Service suggest that American peregrine falcon could be nesting in the Yuba River canyon immediately below New Bullards Bar Dam. Construction of the flood control outlet at New Bullards Bar Dam has the potential to disturb nesting American peregrine falcon. Disturbances may arise from increased noise related to construction as well as an increase in human presence. Construction is not anticipated to alter American peregrine falcon nesting habitat.

According to the BiOp (USFWS 2004a) site specific monitoring shows that wintering bald eagles congregate at New Bullards Bar Dam. Such congregations could be disturbed by construction related noise at the dam, especially if construction occurs during the night when bald eagles may be utilizing nearby tree stands as night roosts. Construction is not anticipated to disturb nesting bald eagles; the nearest nest is the Garden Point nest, more than 1 mile from New Bullards Bar Dam.

One California spotted owl PAC is located north of New Bullards Bar Dam. Construction of the flood control outlet will not modify habitat within the PAC. However, construction generated noise and transport of excavated material to and use of, potential disposal sites at the old quarry, or the flat areas on the north and south side of Marysville Road near the old quarry (Figure 2.2-5) have the potential to disturb nesting spotted owls.

Proposed Conditions

YCWA's proposed Project includes eight conditions that work to minimize and mitigate disturbance to special-status species, NNIP, riparian habitat and wetlands, and vegetative habitat. These conditions are GEN1, GEN2, GEN3, GEN5, GEN6, G&S1, TR1, and TR4. In general these conditions allow YCWA to identify and implement appropriate mitigation (e.g., LOPs, revegetation of disturbed areas and minimization of sedimentation) so that impacts are less than significant.

Recreation Facilities Rehabilitation and Enhancements

The only Project-developed recreation facilities occur at New Bullards Bar Reservoir. Over the term of the new license, all Project recreation facilities will undergo rehabilitation and replacement in order to be consistent with federal, state and local legal requirements, and guidelines. Such rehabilitation and replacement is described in detail in YCWA's Recreation Facilities Plan (Proposed Measure RR1).

Effects on Botanical Resources

Rehabilitation and enhancements of Project recreation facilities will include the use of heavy equipment, which will result in ground disturbance and habitat alteration. At some recreation facilities, rehabilitation and enhancements may include the removal of vegetation and grading.

Special-status plants that have been documented within or adjacent to recreation facilities include Humboldt lily, clustered lady's-slipper, Brandegee's clarkia and one mushroom species, olive phaeocollybia. NNIP that have been documented within or adjacent to recreation facilities include bull thistle, Medusahead grass, Scotch broom, Himalayan blackberry, yellow star-thistle, Bermuda grass, skeleton weed, French broom, and Italian thistle. The remaining vegetative composition in and around recreation facilities is variable, but includes common associations, such as Ponderosa pine and Douglas fir forest, Douglas fir and tan oak forest, and other conifer mixes. No riparian habitats and wetlands are known to exist within or adjacent to recreation facilities.

Effects on Wildlife Resources

Rehabilitation and enhancements of Project recreation facilities will require the use of heavy equipment, such as cranes, backhoes or excavators, road graders, and haul trucks for transport of construction materials. Such activities will also result in increased noise and human presence during construction. At some Project recreation facilities, rehabilitation and enhancement may result in modifications to habitat through removal of vegetation and grading.

Special-status wildlife and protected habitats known to exist at or adjacent (within 0.25 mi) to Project recreation facilities include California spotted owl PACs (Hornswoggle Campground, Moran Road Day Use Area, and Cottage Creek Boat Launch); California spotted owl HRCAs (Schoolhouse Campground, Hornswoggle Campground, Dark Day Campground, Picnic Area and Boat Launch complex, Moran Road Day Use Area, Cottage Creek Boat Launch, and Madrone Cove Campground); and a bald eagle nest (Garden Point Boat-in Campground).

Proposed Conditions

YCWA's Proposed Project includes eight conditions that work to minimize and mitigate disturbance to special-status species, NNIP, riparian habitat and wetlands, and vegetative habitat. These conditions are GEN1, GEN2, GEN3, GEN5, GEN6, G&S1, TR1, and TR4 (described in detail above). In general these conditions allow YCWA to identify and implement appropriate mitigation (e.g., LOPs, revegetation of disturbed areas and minimization of sedimentation) so that impacts are less than significant.

3.3.4.3 Cumulative Effects

3.3.4.3.1 Riparian Vegetation

Riparian vegetation has the potential to be affected by individual or cumulative effects, primarily in response to changes in stream flow regime. Dams may change the volume and timing of peak flow events, and (singular or multiple, sequential dams on the same stream) have the potential to create cumulative affects to flow regimes.

Changes in the volume of peak flow events may impact riparian vegetation over time by decreasing sediment deposition, and limit sites for germinating vegetation. Lower peak flows may decrease hydrologic connectivity with floodplains, which may limit the dispersal of seeds on floodplains and the hydrologic support of existing riparian stands. Reduced streamside

riparian vegetation may decrease the recruitment of LWM, which creates fish habitat and contributes organic material to the stream system.

Changes in the timing of peak flow events may affect woody riparian seed germination and establishment. In the Sierra Nevada Foothills, woody riparian seed dispersal and germination is timed with the recession of unimpaired hydrology following snowmelt. If peak flows do not coincide with vegetation seed dispersal, seedlings may not be delivered to fresh nursery sites, potentially affecting the longitudinal and horizontal distribution, abundance and diversity of woody species. Additionally, an overall reduction in peak flows may potentially strand existing stands or cause the conversion of riparian forest to a more upland-dominated vegetation community.

YCWA conducted riparian studies both up- and downstream of the Englebright Dam and Reservoir. The studies did not identify Project-related cumulative effects on riparian vegetation. In streams upstream of the Englebright Reservoir, riparian vegetation appeared healthy, with seedlings, recruits, and established woody vegetation at various ages (sizes). Limitations on riparian vegetation included steep river canyons with bedrock substrates and few floodplains. Fine sediment transport and deposit may have an impact on riparian vegetation, but no evidence of this was present during field surveys. The presence of NNIPs, including Himalayan blackberry and black locust, has the potential to affect the distribution or abundance of riparian vegetation over time.

In the Yuba River downstream of the Englebright Dam, YCWA's studies identified limited cover and complexity of riparian vegetation due to historic disturbances. A limitation on riparian vegetation was the coarse, unconsolidated substrate of gravel and cobbles that were deposited from upstream hydraulic mining. Fine sediment transport and deposit on banks and floodplains may eventually create a more amenable substrate to support riparian vegetation as a course of recovery, which is altered by upstream dams, including the Englebright Dam.

3.3.4.3.2 Columbian Black-tailed Deer

Even though the Bucks Mountain and Mooretown Deer Herds Management Plan, the Downieville and Nevada City Deer Herd Management Plan, and An Assessment of Mule and Black-tailed Deer Habitats and Populations in California are 30, 29 and 15 years old, respectively, they identify numerous issues that relate to migratory deer within and adjacent to the Project. These include: habitat loss and conversion; habitat condition (acreage of habitat and quality of forage and cover); timber harvest and reforestation practices (e.g., biomass thinning, hardwood removal, and clear-cutting); livestock grazing; wildfire (prescribed fire and fires suppression); developments (residential, reservoirs, ski areas, golf courses and agriculture); natural predation; hunting (legal and illegal); drowning; disease; weather; composition of the deer population relative to their habitat; competition with non-native wildlife species; and highway mortality (Snowden 1984, CDFG 1998). Of those, residential development, forest management practices (including fires suppression and reforestation), lack of habitat disturbances that favors early successional communities, and overgrazing of winter and summer ranges were identified as having the greatest impact on deer within DAU-5 (CDFG 1998).

YCWA is unlikely to contribute, either positively or negatively, to some of the issues identified by CDFG (1998). These include timber harvest and reforestation practices, wildfire, mortality as a result of hunting, disease, weather, grazing, natural predation, composition of the deer population relative to their habitat, and competition with non-native wildlife. However, some O&M and Project related recreation activities could positively or negatively contribute to the effects of many of the remaining issues identified by CDFG (1998).

Historically, the Project itself may be considered an effect under the categories of “habitat loss and conversion, and development.” However, given the current base-line condition as being the basis for cumulative effects analysis, the Project does not propose any new additions (e.g., new dams, reservoirs, roads) that would result in the permanent loss of existing winter range for migratory deer or loss of existing habitat for resident deer.

Habitat condition within the FERC Project Boundary is likely to improve under implementation of the proposed Project’s IVMP (TR1). The IVMP requires YCWA to manage NNIP species through prevention, monitoring and treatment, which includes revegetation of treated areas, within the FERC Project Boundary on NFS land. This would likely increase the availability of native browse species for deer by removal of NNIP and replacement with native species. The IVMP would also reduce loss of existing browse species to competition with NNIP by implementing measures to control the spread of NNIP from the proposed FERC Project Boundary. Under the IVMP, YCWA will also implement revegetation projects, not only for areas that have been treated for NNIP, but in areas subject to ground disturbances, Project improvements, and erosion control. As succession is realized, revegetation projects would likely add to the acreage of existing habitat as well as increase the quality of forage and cover.

Water features such as reservoirs and canals have been identified as developments that act as barriers to movement, and deer attempting to cross these features sometimes drown (Snowden 1984). The proposed Project does not utilize canals for water transport between impoundments and powerhouses; therefore, canal related drownings do not occur. Of the three Project reservoirs, only New Bullards Bar Reservoir has been identified as a migration barrier (Yuba County 1985). Yuba County (1985) indicates that some deer incorporate reservoirs into their migration routes, and in order to accommodate those adjustments, maintaining undeveloped areas of sufficient size around reservoirs are necessary. According to Yuba County (1985), Cal Fish and Wildlife recommends that parcels of 20 ac or larger be maintained in winter range habitat, and parcels of 40 acres or larger be maintained in critical winter range habitat (a subset habitat within winter range habitat types) for new developments. Yuba County also recommends that new developments have a minimum setback of 1,000 ft from winter range and migration corridors. A review of Yuba County Zoning maps shows that lands immediately west of New Bullards Bar Reservoir have been zoned for Rural Residential with a parcel size of 40 ac, and lands immediately east of New Bullards Bar Reservoir have been zoned for Rural Residential with a parcel size of 20 ac (Yuba County 2013). None of the land within the Proposed FERC Project Boundary is available for residential development, thus fragmentation or modification of winter range habitat is unlikely to occur. Yuba County zones for land use around the proposed FERC Project Boundary, therefore Yuba County has the authority to maintain parcel size and development setbacks. Only anecdotal reports of deer swimming across New Bullards Bar Reservoir exist, and there have been no reports of mortality from drowning.

Currently no data are available regarding deer mortality associated with vehicular collisions (road kill) in and around the proposed Project. However, road kill is known to occur and expected to increase annually as a result of local, regional and statewide population growth. Such growth is likely to result in an increase in road miles traveled in and around the Project, which increases the likelihood of deer vehicle interactions. This increase in travel is reflected in the annual recreation use estimate projections for the Project. The estimates show an estimated increase of 50.9 percent, from 116,600 recreation days in 2012 to 175,920 recreation days by 2050 (YCWA 2013).

3.3.4.4 Proposed Environmental Condition

3.3.4.4.1 Conditions Recommended by YCWA

As described above, YCWA's proposed Project includes 16 conditions that apply to terrestrial resources.

- Proposed Condition GEN1 – Consult with the Forest Service Annually Regarding Project Effects on NFS Land
- Proposed Condition GEN2 – Consult with the Forest Service Regarding New Ground Disturbing Activities on NFS Land
- Proposed Condition GEN3 – Consult with the Forest Service Regarding New Facilities on NFS Land
- Proposed Condition GEN4 – Consult with Forest Service Regarding Pesticide use on NFS Land
- Proposed Condition GEN5 – Review Special-status species Lists and Assess Newly-listed Species Annually
- Proposed Condition GEN6 – Train Employees
- Proposed Condition G&S1 – Implement Erosion and Sediment Control Plan
- Proposed Condition G&S3 – Pass Sediment at Our House and Log Cabin Diversion Dams
- Proposed Condition G&S5 – Pass large Woody Material at Our House and Log Cabin Diversion Dams
- Proposed Condition AR1 – Maintain Minimum Steamflows below Our House Diversion Dam, Log Cabin Diversion Dam and New Bullards Bar Dam
- Proposed Condition AR2 – Control Project Spills at Our House Diversion Dam
- Proposed Condition GS6 – Implement New Bullards Bar Floating Material Management Plan
- Proposed Condition TR1 – Implement Integrated Vegetation Management Plan
- Proposed Condition TR2 – Implement Bald Eagle and American Peregrine Falcon Management Plan

- Proposed Condition TR3 – Implement Ringtail Management Plan
- Proposed Condition TR4 – Manage Bats

Each of these conditions is provided in full in Appendix E2. Implementation plans are included in Appendix E3.

3.3.4.4.2 Proposals and Studies Recommended by Agencies or Other Relicensing Participants That Were Not Adopted by YCWA

[Relicensing Participants – This is a placeholder in the Draft License Application. This section will be completed in the Final License Application. YCWA]

3.3.4.5 Unavoidable Adverse Effects

The proposed Project would have both short- and long-term minor impacts on terrestrial resources. Vegetation clearing around Project facilities would continue to occur; however, the impacts would be minor because the area affected is very small, and the areas have been subject to clearing for many years. In addition, implementation of YCWA's IVMP would reduce Project effects, and in some cases enhance wildlife habitats through revegetation of previously disturbed areas, protect populations of special-status plants and management of NNIPs.

Project maintenance activities and recreation would have the potential to affect special-status plant species. However, these effects are considered to be minor, as they impact a small number of occurrences. On federal lands, YCWA's IVMP would reduce Project effects by protecting populations of special-status plants from disturbances that could result from O&M activities and recreation.

Continued Project O&M and recreation use has the potential to contribute to the spread of NNIPs. However, many of these weeds are ubiquitous throughout the region, and implementation of YCWA's IVMP would reduce Project effects.

Project O&M activities and recreation would have the potential to affect special-status wildlife species. However, these effects are considered to be minor. Bald eagles have been known to nest at Garden Point peninsula on New Bullards Bar Reservoir since 1989, fledging 20 young over this 24 year period, an annual reproductive rate of 0.83. While the reproductive rate is lower than 1 fledge young per year goal established in the 1986 Pacific States Bald Eagle Recovery Plan, YCWA was unable to link nest failures to recreation activities, but did find that nest failure occurred most often during years with above normal precipitation (YCWA 2012c). In 2011 a second bald eagle nest was reported at New Bullards Bar Reservoir, and while occupancy has not been confirmed, the nest appears to be maintained annually. Bald eagles have also been known to winter at New Bullards Bar Reservoir with as many as 30 occurrences reported on December 14, 1980 (YCWA 2012c). The continued use of the Garden Point nest, the presence of a second suspected nest and presence of wintering birds suggests that the Project is a benefit to bald eagles by providing valuable nesting habitat and wintering habitat. This is further supported by approaching the Recovery Plan goal for the Pacific Bald Eagle (USFWS

1986) of at least three nesting territories at New Bullards Bar Reservoir. In order to ensure the continued success of nesting at New Bullards Bar Reservoir, YCWA's proposed Bald Eagle and American Peregrine Falcon Management Plan would assure an additional level of protection.

Recent reports of American peregrine falcon nesting in the Yuba River canyon below New Bullards Bar Reservoir and near the Narrows 2 Powerhouse indicates that suitable nesting habitat is present adjacent to the proposed Project. Implementation of YCWA's proposed Bald Eagle and American Peregrine Falcon Management Plan would assure that these suspected nests are not disturbed.

While mortality of Columbian black-tailed deer as a result of vehicular collisions associated with Project O&M and recreation travel cannot be quantified, some level of mortality is expected to continue, and may increase over the life of the license. The existence of New Bullards Bar Reservoir could also continue to be a migration barrier, but as discussed above, numerous generations of deer have occurred since its original development and have since incorporated the reservoir into seasonal migration routes. The proposed Project serves to protect existing wintering habitat within the FERC Project Boundary by restricting non-Project development. Also implementation of the IVMP could enhance habitat by controlling the spread of NNIP, protection of existing native vegetation, and revegetation of disturbed areas.

Two northern goshawk PACs and six California spotted owl PACs indicates the presence of suitable habitat within and adjacent to the proposed FERC Project boundary. YCWA's proposed general conditions and IVMP ensure that project O&M and recreation activities do not modify nesting habitat for either species and reduces disturbances to nesting birds.

Project facilities also support a number of special-status bat species by providing man-made structures for roosting. YCWA's proposal to exclude bats from roosting in structures where human interaction occurs (e.g., public restrooms, powerhouses and office buildings) assure a reduction in the potential to disturb special-status bat roosts.

Impacts to special-status wildlife resulting from construction would, in general, be short in duration, restricted to existing facilities and is not anticipated to modify habitat. Temporary impacts include noise and an increase in human presence. Implementation of YCWA's proposed general conditions, IVMP, Bald Eagle and American Peregrine Falcon Management Plan and Ringtail Management Plan would reduce the effects of construction.