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7.0 BOTANICAL AND WILDLIFE RESOURCES

This section describes the botanical and terrestrial wildlife resources (collectively referred to as terrestrial resources) in the Middle Fork American River Watershed (Watershed). The content requirements for this section are specified in Title 18 of the Code of Federal Regulations (CFR) Chapter 1 § 5.6(d)(3)(v).

The Middle Fork American River Watershed includes the area that provides runoff to the Middle Fork American River and Rubicon River, including their associated tributary streams. The watershed-wide scope of this section was intended to place the Middle Fork American River Project (MFP or Project) within its broader terrestrial environmental context. However, particular emphasis is placed on identifying common and special-status terrestrial resources that occur or are likely to occur within the Federal Energy Regulatory Commission (FERC or Commission) Project boundary.

The information presented in this section is primarily based on data from resource agency files, reports, and databases; published literature, and to a lesser extent, applicable field studies conducted by Placer County Water Agency (PCWA) in 2005. The information in this section will be used to determine the additional technical studies that will be necessary to facilitate a more comprehensive analysis of potential Project impacts on terrestrial resources.

7.1 INFORMATION SOURCES FOR BOTANICAL RESOURCES

This subsection describes sources of information that were evaluated to characterize existing botanical resources in the Middle Fork American River Watershed.

7.1.1 Vegetation Alliances

Information on vegetation alliances was developed using the Classification and Assessment with LANDSAT of Visible Ecological Groupings (CalVeg) data for the Eldorado and Tahoe National Forests (ENF and TNF) (USDA-FS 2000).

The CalVeg system is used to classify existing vegetation present on federally managed forestlands based on LANDSAT color infrared satellite imagery. Data are verified using soil-vegetation maps and professional guidance from various sources statewide.

The term "alliance," as used by CalVeg, corresponds closely to what plant ecologists call a community type and foresters call a forest type or stand. An alliance is characterized by the dominant species of plants that make up the overstory. This usage is consistent with standards developed by the Federal Geographic Data Committee as part of the National Vegetation Classification System.

Specific information on riparian alliances in the Watershed was based on field surveys (helicopter and ground) conducted in August, September, and October 2005 as part of PCWA's 2005-2006 Physical Habitat Characterization Study. The methods and results associated with this study are available in two recent reports prepared by PCWA entitled 2005 Physical Habitat Characterization Report (PCWA 2006) and 2006 Physical Habitat

Characterization Report (PCWA 2007), which are included in Supporting Document (SD G) for reference. Riparian community classifications described in the 2005 and 2006 Physical Habitat Characterization Study Reports were cross-referenced with the CalVeg classification system based on species present. Therefore, all vegetation alliances described in this document are based on the CalVeg classification system.

7.1.2 Special-Status Botanical Resources

Information on special-status botanical resources known to occur or potentially occurring in the Watershed was based on the following information sources:

- United States Department of Agriculture - Forest Service (USDA-FS) survey data for the ENF and TNF
- California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2007)
- California Department of Fish and Game's (CDFG) California Natural Diversity Database (CNDDDB) (CDFG 2007a)
- USDA-FS Regional Forester's List of Sensitive Plant and Animal Species for Region 5 (USDA-FS 1998)
- Sensitive Plants of the Eldorado National Forest (USDA-FS 2006a)
- Tahoe National Forest Sensitive Plants and Fungi (USDA-FS 2006b)
- U.S. Fish and Wildlife Service (USFWS) Species List (USFWS 2007)
- Eldorado National Forest Land and Resource Management Plan (USDA-FS 1990a)
- Tahoe National Forest Land and Resource Management Plan (USDA-FS 1990b)
- Sierra Nevada Forest Plan Amendment (USDA-FS 2004)
- Draft Botanical Resources Study Report and Biological Evaluation for Sensitive Plants for the Pacific Gas and Electric Company (PG&E) Middle Fork Transmission Easement Project (PG&E 2002)

For the purposes of this document, a special-status plant is defined as any plant species that is granted protection by a federal or state agency. Federally listed species granted status by USFWS under the Federal Endangered Species Act (ESA) include threatened (FT), endangered (FE), proposed threatened or endangered (FPT, FPE), candidate (FC), or listed species proposed for delisting (FPD).

USDA-FS maintains lists of Forest Service Sensitive (FSS) plants for each forest. FSS plants are those identified by a Regional Forester as having current or predicted downward trends in population numbers or density, or current or predicted downward trends in habitat quality that would reduce the species' current distribution. USDA-FS develops management plans for these species to prevent a trend toward listing under the ESA, and to ensure the continued existence of viable, well-distributed populations.

State of California listed plant species, which are granted status by the CDFG under the California Endangered Species Act (CESA) include state threatened (ST), endangered (SE), rare (SR), and California Species of Special Concern (CSC).

CNPS also maintains a rating system for rare, threatened, or endangered plants in California. Under the California Environmental Quality Act (CEQA), special-status plants include species listed on CNPS Lists 1B and 2. The ratings included on these lists are defined as follows:

- 1B (rare, threatened, or endangered in California and elsewhere);
- 2 (rare in California but more common elsewhere);

CNPS listed plants are further defined as:

- __.1 (seriously endangered in California (over 80% of occurrences threatened, and a high degree and immediacy of threat));
- __.2 (fairly endangered in California (20-80% of occurrences threatened)); and
- __.3 (not very endangered in California (less than 20% of occurrences threatened or no current threats known)).

For example, a plant rated 2.1 would be rare in California, with more than 80% of occurrences threatened to a high degree, but more common elsewhere.

7.1.3 Noxious Weeds

Information on noxious weeds and invasive non-native plants occurring in the Watershed was obtained through survey data provided by the Placer County Agricultural Commission, Pacific Gas and Electric Company (PG&E), ENF, and TNF, as well as field surveys conducted in August, September, and October 2006 as part of PCWA's 2005-2006 Physical Habitat Characterization Study. Other sources reviewed include the California Invasive Plant Inventory (Cal-IPC 2006), and Noxious Weed Pest Ratings (California Department of Food and Agriculture (CDFA 2007).

Noxious weed is a term used by government agencies for non-native invasive plants that have been defined as pests by law or regulation (CDFA 2007). Cal-IPC defines non-native plants as those species introduced to California after European contact and as a direct or indirect result of human activity. Invasive non-native plants are plants that 1) are not native to, yet can spread into, wildland ecosystems, and that also 2) displace native species, hybridize with native species, alter biological communities, or alter ecosystem processes (Cal-IPC 2006).

7.2 INFORMATION SOURCES FOR WILDLIFE RESOURCES

The following subsections describe the various sources of information that were evaluated to characterize existing terrestrial wildlife resources in the Watershed.

7.2.1 Wildlife Habitats and Associated Common Species

Wildlife habitats present in the Watershed were determined by cross-referencing CalVeg vegetation alliances with the CDFG California Wildlife Habitat Relationship (CWHR) classifications. Common wildlife species potentially occurring within these habitats were determined based on a review of A Guide to Wildlife Habitats of California (Mayer and Laudenslayer 1988) and CDFG's California Wildlife Habitat Relationship System Database, Version 8.1 (CDFG 2005).

7.2.2 Special-Status Wildlife Resources

Information on USDA-FS land allocations for specific animal species and information on special-status terrestrial wildlife species known to occur or potentially occurring in the Watershed was developed using the following information sources:

- USDA-FS survey data for the Eldorado and Tahoe national forests;
- CDFG's Natural Diversity Database (CDFG 2007a);
- USDA-FS Regional Forester's List of Sensitive Plant and Animal Species for Region 5 (USDA-FS 1998);
- USFWS Species List (USFWS 2007);
- Eldorado National Forest Land and Resource Management Plan (USDA-FS 1990a);
- Tahoe National Forest Land and Resource Management Plan (USDA-FS 1990b); and
- Sierra Nevada Forest Plan Amendment (USDA-FS 2004).
- Wildlife Biological Assessment/Evaluation for PG&E Company Middle Fork - Goldhill Transmission Separation Project. (PG&E 2004)

For the purposes of this document, a special-status wildlife species is defined as any animal species that is granted status by a federal, state, or local agency. This section (7.0 Botanical and Wildlife Resources) addresses only terrestrial wildlife species. Aquatic species, including fish and amphibians and aquatic reptiles, are addressed in Section 6.0 Fish and Aquatic Resources of this supporting document.

Federally listed species granted status by USFWS under the ESA include FT, FE, FPT, FPE, FC, or FPD. USDA-FS maintains lists of FSS wildlife species and National Forest Management Indicator Species (MIS) for each forest. FSS species are those wildlife species identified by a Regional Forester as having current or predicted downward trends in population numbers or density, or current or predicted downward trends in habitat quality that would reduce the species' current distribution. USDA-FS develops management plans for these species to prevent a trend toward listing under the ESA, and to ensure the continued existence of viable, well-distributed populations.

Additionally, the National Forest Management Act (NFMA) and the Secretary of Agriculture's implementing regulations (36 CFR 219) require selection of MIS and

evaluation of effects of alternatives on the viability and diversity of plant and animal communities. MIS are used to determine the effects of management on fish and wildlife species. Some MIS species are game wildlife species.

State of California listed terrestrial wildlife species that are granted status by the CDFG under the CESA include ST, SE, California Fully Protected species (CFP), and CSC.

7.2.3 Game Species

Information on game species known to occur or potentially occurring in the Watershed was developed using the following information sources:

- CDFG Report of the 2004 Game Take Hunter Survey (CDFG 2004);
- California State Fish and Game Code;
- Eldorado National Forest Land and Resource Management Plan (USDA-FS 1990a);
- Tahoe National Forest Land and Resource Management Plan (USDA-FS 1990b);
- Deer Hunting Draft Environmental Document (CDFG 2007b);
- The Blue Canyon Deer Herd Management Plan (Fowler 1982); and
- The Pacific Deer Herd Management Plan (Hinz 1981).

7.3 DESCRIPTION OF EXISTING BOTANICAL RESOURCES

This subsection describes the existing botanical resources in the Watershed, as determined using the information sources cited above. Vegetation alliances are discussed first, followed by special-status botanical resources, and noxious weeds. Special emphasis is placed on botanical resources that occur or have the potential to occur within the FERC Project boundary.

7.3.1 Vegetation Alliances

Information on vegetation alliances is summarized to provide a broad characterization of the kinds of trees, shrubs, and herbs that occur in the Middle Fork American River Watershed. While knowledge of vegetation alliances can provide information about where special-status resources are most likely to occur, no regulatory protections are associated with the vegetation alliances themselves. Thirty-two vegetation alliances were identified as occurring within the Watershed. These include three herb-dominated alliances, seven shrub-dominated alliances, and 21 tree-dominated alliances. One non-vegetated category (Barren) is also identified. Descriptions for each vegetation alliance, based on CalVeg—A Classification System for California Vegetation (USDA-FS 2005), are provided in Appendix 7-A. Map 7-1 depicts the distribution of these vegetation alliances in the Watershed.

7.3.2 Special-Status Botanical Resources

This subsection summarizes special-status plants that occur within the Watershed.

A list of 57 special-status plants species was compiled from USFWS, USDA-FS, CDFG, and CNPS lists of special-status plants known to occur or potentially occurring in the Watershed and from survey data for the ENF and TNF. Of these 57 plants, four are known to be located within the MFP FERC Project boundary at the following locations:

- Pleasant Valley mariposa lily: USDA-FS records show a population of Pleasant Valley mariposa lily in the immediate vicinity of the Hell Hole-Middle Fork Tunnel, about 2 miles west of the North Fork Long Canyon Crossing/Removable Section. However, the Project facility (tunnel) at this location is underground.
- Red Hills soaproot: USDA-FS records show a population of Red Hills soaproot at the Ralston Afterbay penstocks and butterfly valve house. PG&E (PG&E 2002) identified three additional populations along the confluence of the North Fork MFAR and Rubicon River with the Middle Fork MFAR.
- Yellow bur navarretia: USDA-FS records show a population of yellow bur navarretia at the Hell Hole-Middle Fork Tunnel Butterfly Valve House (14N55) Access Road.
- Stebbins' phacelia: USDA-FS records show a population of Stebbins' phacelia at the Middle Fork-Ralston Tunnel, about 0.5 mile east of the Middle Fork-Ralston Tunnel Surge Shaft, Tank, and Storage Building. However, the Project facility (tunnel) at this location is underground. USDA-FS records also show a population at the Duncan Creek Diversion intake road.

Based on an analysis of preferred habitat, known geographic and elevational ranges, and occurrence records of special-status plants within the Watershed, it was determined that 48 of the remaining 53 plants species have the potential to occur within the FERC Project boundary. Five species, Trinity Mountain rock cress, Lake Tahoe draba, Cup Lake draba, long-petaled lewisia, and Munroe's desert mallow, were determined to be unlikely to occur in the vicinity of the Project and are therefore not addressed further in this document. Table 7-1 summarizes pertinent information for all 57 special-status plant species, including status, blooming period, and preferred habitat, with notes on occurrence within the FERC Project boundary and the Watershed. Appendix 7-B provides life history information for all special-status plants known or potentially occurring in the Watershed.

In addition to special-status plants, CNDDDB records identify the Placer Big Tree Grove, located within the TNF in the vicinity of Mosquito Creek, at approximately 4,500 feet in elevation. This is a one-acre grove containing six old-growth giant sequoia trees, with the largest tree measuring approximately 12 feet in diameter. The grove, which represents the northernmost range limit of the species, is of particular interest because of its small size and distance from larger groves to the south. The old-growth trees in the grove are believed to be non-reproductive, although a number of sequoia saplings have been planted (CDFG 2007a). The grove is open to the public. No specific regulations are associated with this grove. This grove is not within or near the FERC Project boundary and is therefore not addressed further in this document.

Map 7-2 shows the locations of known occurrences of special-status plants, as well as the Big Tree Grove, in the Watershed. CNPS and PG&E (2002) occurrences are not included in Map 7-2 because Geographic Information System (GIS) location information was not available.

7.3.3 Noxious Weeds

Data on the occurrence of noxious weeds in the Watershed were obtained for the ENF and TNF. Data from the ENF indicate that there are populations of noxious weeds within the FERC Project boundary on the Spur Road to North Fork Long Canyon Diversion. Data from the TNF indicate that there are populations of noxious weeds within the FERC Project boundary at the following locations: Ralston Afterbay near the Ralston Picnic Area and along Interbay Dam Road, approximately 1 mile to the northwest of the Interbay Dam. Table 7-2 lists noxious weed species known or potentially occurring in the Watershed, within the ENF and TNF. Map 7-3 shows the locations of noxious weed occurrences in the Watershed, within the ENF and TNF.

PG&E (PG&E 2002) identified additional noxious weed populations within the Watershed. These included populations of noxious weeds along a PG&E transmission line in the vicinity of Ralston Afterbay. Noxious weed occurrences identified in this report were not included in Map 7-3 because GIS data were not available.

7.4 DESCRIPTION OF EXISTING WILDLIFE RESOURCES

This section describes wildlife resources in the Watershed including wildlife habitats and associated common wildlife species. Special-status wildlife resources and game species are also described. Special emphasis is placed on wildlife resources that occur or have the potential to occur within the FERC Project boundary.

7.4.1 Wildlife Habitats and Associated Common Wildlife Species

Information on wildlife habitats is summarized to provide a broad characterization of the habitats and common animal species that occur in the Watershed. While knowledge of wildlife habitats may provide information about where special-status wildlife are most likely to occur, no regulatory protections are associated with the wildlife habitats themselves. Eighteen wildlife habitats were identified within the Watershed based on a “crosswalk” between USDA-FS CalVeg alliances in the Watershed and CDFG’s CWHR wildlife habitat classifications (Table 7-3). The CalVeg-CWHR crosswalk was developed by USDA-FS and CDFG as a way to determine which wildlife habitats are likely to be present based on existing vegetation communities and forest structural characteristics.

Habitats identified in the Watershed include two herb-dominated habitats, three shrub-dominated habitats, twelve tree-dominated habitats, and one non-vegetated habitat. Habitat descriptions, based on *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988), are provided in Appendix 7-C. The descriptions include examples of common animal species likely to occur in each habitat as determined using the CDFG CWHR database (CDFG 2005). This database uses a predictive model to

determine the likelihood of the occurrence of animal species in any given geographical location based on ecological data included in the model such as the life history and known distribution of an animal, existing vegetation, percent canopy cover, presence of water, and a number of other elements including landscape features.

7.4.2 Special-Status Wildlife Resources

This subsection describes special-status wildlife resources in the Watershed. The first part addresses land allocations designated by the USDA-FS for the management of specific animal species including northern goshawk, California spotted owl, great gray owl, American marten, and Pacific fisher. The second part addresses special-status animal species that are known to or have the potential to occur in the Watershed.

USDA-FS Land Allocations

The USDA-FS has identified management areas for selected species in the Watershed. These include Protected Activity Centers (PACs) for northern goshawk, California spotted owl, and great gray owl; Home Range Core Areas (HRCAs) for California spotted owl; and Forest Carnivore Den Sites for American marten and Pacific fisher. These land allocations were identified to provide direction to land managers for designing and developing fuels and vegetation management projects (USDA-FS 2001a). Activities that occur within these land allocations must be consistent with desired conditions (statements that identify a common vision for a specific land management area) and other management intents and objectives. The designation of each of these land allocations and USDA-FS desired conditions are described below based on the Sierra Nevada Forest Plan Amendment - Final Supplemental EIS (USDA-FS 2004).

Protected Activity Centers

Northern Goshawk

The USDA-FS designates PACs surrounding all known and newly discovered northern goshawk breeding territories on national forest lands based on the location of the most recently documented nest site and the location(s) of alternate nests. If the actual nest site is not located, the PAC designation is based on the location of territorial adult birds or recently fledged juvenile goshawks during the fledgling dependency period (USDA-FS 2004). In addition, USDA-FS desired conditions state that the PAC should include either “the best available 200-acres of forested habitat in the largest continuous patches,” or the largest possible patches of habitat within 0.5 miles of one another. Best available habitat is defined as forest land having the following characteristics:

- trees in the dominant and co-dominant crown classes averaging at least 24 inches diameter at breast height (dbh);
- at least 70% tree canopy cover in westside conifer and eastside mixed conifer forests, and at least 60% tree canopy cover in eastside pine forests; and

- non-forest vegetation (e.g., brush, meadows, etc.) should not be counted as part of the 200 acres.

Map 7-4 presents the locations of the northern goshawk nests and associated PACs in the Watershed. Table 7-4 provides detailed information on the location of northern goshawk PACs within the FERC Project boundary.

Great Gray Owl

PACs are established for great gray owl based on the location of known nests and include at least “50 acres of highest quality nesting habitat”, where highest quality habitat is defined as:

- conifer forest comprised of medium (at least 11 inches dbh) to large (at least 24 inches dbh) trees with a canopy cover of at least 60%; and
- adjacent meadow vegetation which supports a sufficiently large prey population (e.g., meadow voles) to sustain the owl through the breeding season (USDA-FS 2004).

There are currently no great gray owl PACs in the ENF or the TNF within the Watershed (Lipton, pers. comm., 2006 and Triggs, pers. comm., 2006). Additionally, there are no recorded great gray owl nests or sightings in the TNF or ENF within the Watershed (CNDDDB 2007).

California Spotted Owl

PACs for territorial California spotted owl in national forest lands are based on one of the following: the location of the most recent documented nest site or the most recent known roost site when a nest location remains unknown, or a central point based on repeated daytime detections, when neither nest or roost locations are known (USDA-FS 2004). Aerial photography interpretation and field verification are used as needed to delineate PACs. In addition, USDA-FS desired conditions state that each PAC should encompass “the best available 300 acres of habitat in as compact a unit as possible,” where best available habitat is defined as forest land having the following characteristics:

- two or more tree canopy layers;
- trees in the dominant and co-dominant crown classes averaging 24 inches dbh or greater; and
- at least 70% tree canopy cover (including hardwoods).

Map 7-5 shows the locations of the California spotted owl nests and associated PACs in the Watershed. Table 7-4 provides detailed information on the location of California spotted owl PACs within the FERC Project boundary.

Home Range Core Areas

California Spotted Owl

In addition to PACs, HRCAs were established surrounding each territorial California spotted owl activity center detected after 1986. The size of the HRCA is calculated as 20% of the area of the sum of average breeding pair home range size (for each forest) plus one standard error. The HRCA includes the PAC as well as the best available California spotted owl habitat in the closest proximity (within 1.5 miles) to the activity center (USDA-FS 2001a). USDA-FS desired conditions state that spotted owl HRCAs should consist of large habitat blocks that have the following characteristics:

- at least two tree canopy layers;
- at least 24 inches dbh in dominant and co-dominant trees;
- a number of very large (greater than 45 inches dbh) old trees;
- at least 50% to 70% canopy cover; and
- higher than average levels of snags and down woody material.

Map 7-5 shows the locations of the California Spotted Owl HCRA's in the Watershed.

Forest Carnivore Den Sites

The USDA-FS has established buffer areas to protect breeding mesocarnivores, including American marten and Pacific fisher, on national forest lands in the Watershed (USDA-FS 2004), as described in the following.

American Marten

Buffer areas are delineated for American marten based on the location of verified natal and maternal dens, and include 100-acre buffers consisting of the highest quality habitat in a compact arrangement surrounding the den site. Highest quality habitat is defined as a multi-storied forest with the dominant layer composed of large (greater than 24 inch dbh) conifer trees, and a canopy cover closure of at least 60%. In addition, USDA-FS desired conditions state that areas surrounding marten den sites should have at least two conifers per acre greater than 24 inches dbh with suitable denning cavities, more than 10 tons per acre of coarse woody debris in decay classes 1 and 2, and an average of six snags per acre on the west side Sierra Nevada, and three per acre on the east side.

There are currently no American marten den sites in the ENF or TNF within the Watershed (Lipton, pers. comm., 2006 and Triggs, pers. comm., 2006).

Pacific Fisher

Buffer areas are delineated for Pacific fisher based on the location of verified natal (birthing) and maternal (kit-rearing) dens, and include a 700-acre buffer of the highest quality habitat, defined as conifer forest with medium to large trees (11 to 24 inch dbh),

and a canopy cover closure exceeding 80%. In addition, USDA-FS desired conditions state that areas surrounding fisher den sites should include at least two large (greater than 40 inches dbh) conifers per acre, and one or more oaks (greater than 20 inches dbh) per acre with suitable denning cavities.

There are currently no Pacific fisher dens in the ENF or TNF within the Watershed (Lipton, pers. comm., 2006 and Triggs, pers. comm., 2006). A recent study by Zielinski et al. (2005) on the current and historical distribution of mesocarnivores in California suggests that Pacific fisher are currently absent from the central Sierra, from eastern Shasta County to Mariposa County. This gap in distribution is potentially due to a combination of loss of mature forest habitat, residential development, and the latent effects of mammalian trapping (Zielinski et al. 2005).

Special-Status Terrestrial Wildlife Species

A list of 29 special-status terrestrial wildlife species was compiled from USFWS, USDA-FS, and CDFG lists of special-status wildlife species known to occur or potentially occurring in the Watershed. Of these 29 wildlife species, three are known to occur within the FERC Project boundary. Species are considered as being known to occur in a given location if there are records of a nest, den, or roosting site supporting probable residency of an animal at that location for at least a portion of the year. For the purposes of this document, a buffer of 500 feet was assumed around bald eagle and osprey nests. Presence of northern goshawk and California spotted owl PACs was considered evidence of a known occurrence in a given area. The three wildlife species determined to occur within the FERC Project boundary are:

- Osprey: CNDDDB records indicate that a nest is present approximately 330 feet northeast of the French Meadows Dam.
- Northern goshawk: Northern goshawk PACs intersect FERC Project boundaries in a number of locations (Map 7-4). Additionally, sightings and nest locations for this species are well documented by USDA-FS throughout the Watershed.
- California spotted owl: California spotted owl PACs intersect FERC Project boundaries in a number of locations (Map 7-5). Additionally, sightings and nest locations for this species are well documented by USDA-FS throughout the Watershed.

Based on an analysis of preferred habitat, known geographic and elevational range, and occurrence records within the Watershed, it was determined that 20 of the remaining 26 wildlife species have the potential to occur within the FERC Project boundary. Six species were determined to be unlikely to occur in the vicinity of the Project, and are therefore not addressed further in this document. Table 7-5 summarizes pertinent information for all 29 special-status terrestrial wildlife species, including status, habitat requirements, and potential for occurrence in the FERC Project boundary and Watershed. Appendix 7-D provides life history information for all special-status terrestrial wildlife species known or potentially occurring in the Watershed. Map 7-6

shows the locations of known occurrences of special-status wildlife in the Watershed. Species occurrences are based on data currently available.

Northern goshawk and California spotted owl are known to occur in the Watershed. Individual sightings of Northern goshawk and California spotted owl are not included on Map 7-6 due to the large number of records. These sightings typically occur in or around PACs which are shown on Maps 7-4 and 7-5.

7.4.3 Game Species

A number of game species are known to occur or have the potential to occur in the Watershed. Hunting of game species is permitted in the Watershed within the ENF and TNF during seasons regulated by the CDFG, except in portions of the TNF that have been designated as a State Game Refuge (Fish and Game Code §10825). Refuge boundaries extend, roughly, from the west end of French Meadows Reservoir to the northwest portion of the Granite Chief Wilderness. While the designation is intended primarily to protect habitat used by the Blue Canyon mule deer herd, California state law prohibits hunting of any species within a State Game Refuge. State law also prohibits possession or discharge of firearms, pellet guns, and bows and arrows within the Refuge.

Table 7-6 lists the game species potentially occurring in the Watershed, including their habitat requirements and a summary of state hunting regulations for each species. A brief summary of the game species known to occur or potentially occurring in the Watershed is provided below, including resident game birds, migratory game birds, game mammals, and fur-bearing mammals.

Resident and Migratory Game Birds

Upland birds known or likely to occur in the Watershed that meet the definition of resident game birds (California Fish and Game Code §3500) include blue grouse, wild turkey, mountain quail, and California quail. Birds that meet the definition of migratory game birds (California Fish and Game Code §3500) include Wilson's snipe, band-tailed pigeon, and mourning dove.

Game Mammals

California Fish and Game Code (§3950(a)) defines several mammals, including deer, bears, jackrabbits and hares, and tree squirrels, as game mammals. Coyotes and bobcats are considered non-game species, but are commonly hunted wildlife species, and so are included in this section. These species are discussed below.

Mule Deer

Mule deer are among the most visible and widespread wildlife species in California, and they are plentiful in the Watershed, which includes two Deer Hunt Zones, D4 and D5, and one Deer Assessment Unit, DAU 5. The combined deer population for these two zones is estimated to be approximately 25,000 (CDFG 2007b). In the early nineties, the average population of DAU 5 (which includes Deer Hunt Zones D3, D4, D5, and D6)

was 70,000 deer, and the population was declining (CDFG 2007b). Threats to the deer population include fire exclusion, changes in logging practices, livestock grazing, and loss of winter range.

Deer hunting occurs in the Watershed, and is regulated by California state law through CDFG. A hunting license and a hunting tag are required to take mule deer, and only bucks with antlers with demonstrable forks (or greater) may be taken, except during special hunts. As noted previously, deer hunting is prohibited within the boundaries of the State Game Refuge in the vicinity of French Meadows Reservoir.

The following habitat areas are important to mule deer in the Watershed (USDA-FS 1990b, Fowler 1982, and Hinz 1981):

- Summer range, which is characterized as upper elevation habitat that provides cover and foraging and fawning habitat, includes moist meadows, brush-fields, seeps and springs, and riparian areas.
 - Critical summer range is a subset of summer range that consists of areas believed to be especially critical to the life cycle of migratory deer.
 - Critical fawning areas include those portions of summer range believed to be crucial for species persistence and reproduction.
- Winter range is characterized as lower elevation habitat that provides foraging and cover. Subsets of winter range include:
 - Critical winter range, which includes areas believed to be especially critical to the life cycle of migratory deer, and
 - Key winter range, defined as the portion of the yearlong range where deer congregate in response to food and/or cover during severe winter weather conditions.
- Intermediate range includes portions of the range located between summer and winter ranges that are used during migration. Summer and intermediate range often overlap depending upon annual climatic variation, and so are discussed together where applicable.
- Holding areas are where large numbers of deer congregate prior to migration.

Two deer herds, the Blue Canyon mule deer herd and the Pacific mule deer herd are present in the Watershed (CDFG 2007b, USDA-FS 1990b, Fowler 1982, and Hinz 1981). Information on the status of each herd and the location of important habitat areas for each herd in the Watershed and within the FERC boundary is summarized below.

Blue Canyon Deer Herd

The Blue Canyon mule deer herd occurs north of the Rubicon River and south of Interstate 80, on the western slope of the Sierra Nevada. The herd is primarily migratory, with a subset of non-migratory deer that occupy the Foresthill Divide area.

The herd includes individuals of three subspecies: Columbian black-tailed deer, California mule deer, and Rocky Mountain mule deer. At the time the Blue Canyon Deer Herd Management Plan (Fowler 1982) was prepared, the herd had an average size of 4,500 and showed a decline trend that began in the 1960s. Low recruitment of fawns into the yearling class is believed to be a major limiting factor for this herd. Other population threats include changes in timber harvest practices, suppression of natural fires, habitat loss, overgrazing, predation, and poaching.

Map 7-7 shows the locations of Blue Canyon mule deer habitats and migratory patterns in the Watershed. Table 7-7 summarizes Blue Canyon mule deer fawning areas, holding areas, and critical ranges that intersect the FERC Project boundary.

Pacific Deer Herd

The Pacific deer herd occurs on the western slope of the Sierra Nevada, bounded by the Rubicon River to the north and the South Fork American River to the south. The herd consists of two subspecies of mule deer: Columbian blacktail and California mule deer. The Pacific Deer Herd Management Plan (Hinz 1981) lists the population of the Pacific herd at 3,900 deer, and declining. Poor fawn survival and recruitment are thought to be population limiting factors. Threats to the Pacific deer herd include actions that lead to direct loss of habitat and actions that negatively affect habitat including residential development, grazing and logging practices, fire suppression, recreation, and poaching.

Map 7-8 shows the locations of Pacific mule deer habitats and migratory patterns in the Watershed. Table 7-7 summarizes Pacific mule deer habitats that lie within the FERC Project boundary.

Other Game Mammals

Other game mammals known or potentially occurring in the Watershed include, but are not limited to, snowshoe hare, jackrabbit, western gray squirrel, coyote, black bear, and bobcat.

Table 7-6 provides the status, habitat requirements, and a summary of state hunting regulations for each of these species.

Fur-bearing Mammals

California Fish and Game Code (§4000) defines several mammals that are known to occur or are potentially occurring in the Watershed as fur-bearing mammals (i.e., mammals that have traditionally been hunted for their pelts). These include, but are not limited to, gray fox, raccoon, long-tailed weasel, mink, and American badger.

Table 7-6 provides the status, habitat requirements, and a summary of state hunting regulations for each of these species.

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TABLES

Table 7-1. Special-Status Plant Species of the Middle Fork American River Watershed.

Scientific Name	Common Name	Federal Status	State Status	CNPS List	Blooming Period/Fertile	Habitat	Occurrence Notes
Special-Status Plants Known to Occur Within FERC Project Boundaries							
<i>Calochortus clavatus</i> var. <i>avius</i>	Pleasant Valley mariposa lily	FSS ³	–	1B.2	March–June	Lower montane coniferous forests with Josephine silt loam and volcanic soils. From 1,000 to 6,300 feet in elevation.	Known to occur within FERC Project Boundaries at the Hell Hole–Middle Fork Tunnel, about 2 miles west of the North Fork Long Canyon Crossing/Removable Section. Other populations known within the watershed at the following locations: 3 populations on the north side of Long Canyon Creek, ~ 8 miles west of Ralston Afterbay; 2 populations on the south side of Long Canyon Creek, ~ 10 miles west of Ralston Afterbay; 4 populations on the North Fork Rubicon River, ~ 7 miles west of the confluence of the two forks; 2 populations in the vicinity of the confluence of the North and South forks of Long Canyon Creek; and 10 populations ~ 5 miles south of Hell Hole Reservoir at the junction of the North and South forks of the Rubicon River.
<i>Chlorogalum grandiflorum</i>	Red Hills soaproot	–	–	1B.2	May–June	Cismontane woodland, chaparral, and lower montane coniferous forests on serpentine or gabbro soils. From 850 to 3,500 feet in elevation.	Known to occur within FERC Project Boundaries at the Ralston Afterbay penstocks and butterfly valve house. Other populations within the watershed recorded in the following locations: <u>Tunnel Hill USGS 7.5" quad</u> : Rubicon River Canyon and south of the Middle Fork Rubicon River. <u>Michigan Bluff USGS 7.5" quad</u> : just east of the confluence of the Middle and North Fork American River, SSE of Michigan Bluff; north of the Rubicon River, east of the confluence with the Middle Fork American River, SSE of Michigan Bluff; SW of Ralston Mine, SSE of Michigan Bluff; and NW of Ralston Mine, on Hwy 23.
<i>Navarretia prolifera</i> ssp. <i>lutea</i>	Yellow bur navarretia	FSS ¹	–	4.3	May–July	Chaparral, cismontane woodland. Dry rocky flats near drainage channels. From 2,850 to 4,600 feet in elevation.	Known to occur within FERC Project Boundaries at the Hell Hole–Middle Fork Butterfly Valve House Access Road (14N55). Other populations known within the watershed at the following locations: 3 populations south of the Middle Fork Powerhouse in vicinity of the Hell Hole–Middle Fork Tunnel Portal Access Road and the Hell Hole–Middle Fork Tunnel Surge Shaft Access Road; and 2 populations south of the Rubicon River at river mile 18; and 1 population at river mile 14 (.5 miles north of Stumpy Meadows Reservoir).
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	FSS ³	–	1B.2	June–July	Cismontane woodland, lower montane coniferous forest, riparian woodland, meadows and seeps. From 2,000 to 7,050 feet in elevation.	Known to occur within FERC Project Boundaries at the Middle Fork Ralston Tunnel, about .5 miles east of the Middle Fork–Ralston Tunnel Surge Shaft and Tank and at the Duncan Creek Diversion intake road. Other populations known within the watershed at in the following locations: <u>Devil Peak USGS 7.5" quad</u> : In the vicinity of Leonardi Spring Waterfall; Big Grizzly Canyon Creek near junction with Rubicon River; scattered along Long Canyon Creek; scattered along Wallace Canyon Creek near junction with Long Canyon Creek; and 1 mile east of Pigeon Roost Mine. <u>Tunnel Hill USGS 7.5" quad</u> : Long Canyon Creek near junction with Rubicon River; Pilot Creek near junction with Rubicon River; and Ralston Ridge, south of powerline access road near junction with USFS Road 14N25.. <u>Greek Store USGS 7.5" quad</u> : Big Mosquito Creek near junction with Side Creek; North Fork of Middle Fork American River near junction with Deep Canyon Creek; Deep Canyon Creek near junction with Little Grizzly Creek; Grouse Creek Canyon near junction with South Branch Grouse Creek; Duncan Creek, near Trap Line Mine. Middle Fork American River 2 miles upstream of confluence with Duncan Creek. <u>Robbs Peak USGS 7.5" quad</u> : north of Gerle Creek dispersed camping area; west of Rubicon River, near Ellicot Bridge

Table 7-1. Special-Status Plant Species of the Middle Fork American River Watershed.

Scientific Name	Common Name	Federal Status	State Status	CNPS List	Blooming Period/Fertile	Habitat	Occurrence Notes
							<p><u>Duncan Peak USGS 7.5" quad</u>: Manila Canyon, South of Merz Mine; near confluence of Screwauger and Antoine Canyon creeks; and Secret Canyon, south of the Foresthill Divide.</p> <p><u>Royal Gorge USGS 7.5" quad</u>: Little Duncan Canyon, SW of summit of Sunflower Hill.</p> <p><u>Bunker Hill USGS 7.5" quad</u>: NW of French Meadows Reservoir, before Duncan Diversion Dam.</p> <p><u>Wentworth Springs USGS 7.5" quad</u>: north of Neck Meadow and Gerle Creek.</p>
Special-Status Plants Potentially Occurring Within FERC Project Boundaries							
<i>Allium tribracteatum</i>	Three-bracted onion	FSS ¹	–	1B.2	April–August	Chaparral, lower montane coniferous forest and upper montane coniferous forest. From 4,000 to 8,000 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species
<i>Arctostaphylos nissenana</i>	Nissenan manzanita	FSS ¹	–	1B.2	February–March	Open rock ridges in chaparral and closed-cone coniferous forests. From 1,450 to 3,600 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species. Known to occur in the watershed near the junction of Otter Creek and the Middle Fork American River and on the Middle Fork American River approximately 4 miles upstream of the junction with Otter Creek.
<i>Astragalus webberi</i>	Webber's milk-vetch	FSS ²	–	1B.2	May–July	Lower montane coniferous forest. From 2,400 to 3,700 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Atractylocarpus flagellaceus</i>	Flagella-like atractylocarpus	–	–	2.2	N/A	Cismontane woodlands. From 300 to 1,600 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species. Known to occur in the watershed within the USGS 7.5" quad Wentworth.
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	Big-scale balsamroot	FSS ¹	–	1B.2	March–June	Chaparral, Cismontane woodland and Valley and foothill grassland. From 300 to 4,600 feet in elevation..	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Boletus pulcherrimus</i>	Red-pored bolete	FSS ²	–	–	fruiting from late fall to early winter	No elevation restriction, older-mixed conifer	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species
<i>Botrychium ascendens</i>	Upswept moonwort	FSS ³	–	2.3	Fertile July–August	Lower montane coniferous forests near streams, grassy fields. From 4,800 to 7,300 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species. Known to occur within the watershed in the vicinity of the Duncan Creek Diversion, upstream of the FERC boundary.
<i>Botrychium crenulatum</i>	Scalloped moonwort	FSS ³	–	2.2	Fertile June–July	Lower montane coniferous forests, bogs, fens, and moist meadows. From 4,900 to 10,800 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species. Known to occur in the watershed within the USGS 7.5" quad Wentworth.
<i>Botrychium lunaria</i>	Common moonwort	FSS ³	–	2.3	August	Meadows and seeps, moist riparian areas, subalpine coniferous forest and upper montane coniferous forest. From 4,000 to 10,000 feet elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species
<i>Botrychium minganense</i>	Mingan moonwort	FSS ³	–	2.2	July–September	Lower and upper montane coniferous forest, moist riparian areas. From 4,000 to 6,700 feet in elevation	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species
<i>Botrychium montanum</i>	Mountain moonwort	FSS ³	–	2.1	July–September	Lower montane coniferous forests. From 4,500 to 6,400 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Bruchia bolanderi</i>	Bolander's bruchia	FSS ³	–	2.2	N/A	Lower and upper montane coniferous forest, meadows in damp soils. From 4,000 to 9,500 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Clarkia biloba</i> ssp. <i>brandegeae</i>	Brandegge's clarkia	FSS ²	–	1B.2	May–July	Chaparral, cismontane woodland, often roadcuts. From 950 to 3,200 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species. Known to occur in the watershed along Yankee Jim's Road about 1.3 miles east of Shirttail Canyon Road.

Table 7-1. Special-Status Plant Species of the Middle Fork American River Watershed.

Scientific Name	Common Name	Federal Status	State Status	CNPS List	Blooming Period/Fertile	Habitat	Occurrence Notes
<i>Cypripedium fasciculatum</i>	Clustered lady's slipper	FSS ³	–	4.2	March–August	Lower montane coniferous forest, serpentine seeps and streambanks. From 500 to 7,200 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species. This species is known to occur in Placer County.
<i>Cypripedium montanum</i>	Mountain lady's slipper	FSS ²	–	4.2	March–August	Broad-leaved upland and lower montane coniferous forests, on dry shaded slopes. From 600 to 7,500 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Dendrocollybia racemosa</i>	Branched collybia	FSS ²	–	–	fruiting from late fall to mid-winter	No elevation restriction, older mixed conifer	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Epilobium howellii</i>	Subalpine fireweed	FSS ³	–	1B.3	July–August	Meadows, subalpine coniferous forest, wet meadows, mossy seeps. From 6,000 to 9,000 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Epilobium oregonum</i>	Oregon fireweed		–	1B.2	June–September	Bogs, fens, meadows, small streams and ditches in lower and upper montane coniferous forests. From 1,600 to 8,500 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Erigeron miser</i>	Starved fleabane	FSS ²	–	1B.3	June–October	Upper montane coniferous forest, rocky soils. From 6,000 to 8,600 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Eriogonum tripodum</i>	Tripod buckwheat	FSS ¹	–	4.2	May–July	Chaparral, cismontane woodlands, often on serpentine outcroppings. From 650 to 5,250 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species. This species is known to occur in Placer County.
<i>Eriogonum umbellatum</i> var. <i>torreyanum</i>	Donner Pass buckwheat	FSS ²	–	1B.2	July–September	Upper montane coniferous forests, chaparral, and meadows. Volcanic and rocky soils. From 6,000 to 8,000 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Fissidens aphelotaxifolius</i>	Brook pocket-moss	FSS ²	–	2.2	N/A	Lower and upper montane coniferous forest, rock, stream channels and waterfalls. From 6,500 to 7,200 feet in elevation	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Fritillaria eastwoodiae</i>	Butte County fritillary	FSS ²	–	3.2	March–May	Chaparral, cismontane woodland, lower montane coniferous forest (openings), wet and dry slopes red clay or sandy loam. From 100 to 5,000 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species. Known to occur within the watershed in the USGS 7.5" quad Foresthill. Exact location not disclosed due to the sensitivity of the data.
<i>Helodium blandowii</i>	Blandow's bog-moss	FSS ³	–	2.3	N/A	Meadows and seeps, subalpine coniferous forest; damp soil. From 6,500 to 8,900 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Horkelia parryi</i>	Parry's horkelia	FSS ¹	–	1B.2	April–June	Chaparral, cismontane woodland. From 250 to 3,600 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species. Known to occur in the watershed Hornblende Mountains, northeast of Georgetown and on Otter Creek 3 miles upstream of confluence of the Middle Fork American River
<i>Hydrothyria venosa</i> (<i>Peltigera hydrothyria</i>)	Veined water lichen	FSS ³	–	–	N/A	Aquatic, in spring-fed streams with clear, cold water. From 1,150 to 7,000 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Ivesia aperta</i> var. <i>aperta</i>	Sierra Valley mousetail	FSS ²	–	1B.2	June–September	Great Basin scrub, lower montane coniferous forest, meadows and seeps, pinyon and juniper woodland, vernal pools - vernal mesic, usually volcanic. From 4,500 to 7,500 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Ivesia aperta</i> var. <i>canina</i>	Dog Valley mousetail	FSS ²	–	1B.1	June–August	Openings in lower montane coniferous forests and in meadows and seeps. Volcanic and rocky soils. From 4,500 to 7,500 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Ivesia sericoleuca</i>	Plumas mousetail	FSS ²	–	1B.2	May–September	Great Basin scrub, lower montane coniferous forest, meadows and seeps, and vernal pools. From 4,500 to 7,500 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Ivesia webberi</i>	Webber's mousetail	FC FSS ²		1B.1	May–July	Great Basin scrub, lower montane coniferous forest, in sandy or gravelly soils. From 4,500 to 7,500 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.

Table 7-1. Special-Status Plant Species of the Middle Fork American River Watershed.

Scientific Name	Common Name	Federal Status	State Status	CNPS List	Blooming Period/Fertile	Habitat	Occurrence Notes
<i>Lewisia cantelovii</i>	Cantelow's lewisia	FSS ²	–	1B.2	May–October	Broadleaf upland, chaparral, cismontane woodlands, and lower montane coniferous forests. From 1,000 to 4,500 feet in elevation	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Lewisia kelloggii</i> ssp. <i>hutchisonii</i>	Kellogg's lewisia (subspecies <i>hutchinsonii</i>)	FSS ³	–	3.3	July–August	Decomposed granite and slate soils, at the north sides of passes and ridge-tops from 5,200 to 7,000 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Lewisia kelloggii</i> ssp. <i>kelloggii</i>	Hutchison's lewisia (subspecies <i>kelloggii</i>)	FSS ³	–	–	July–August	Upper montane coniferous forest, rocky open ridges. From 5,400 to 9,000 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Lewisia serrata</i>	Saw-toothed lewisia	FSS ³	–	1B.1	May–June	Broad-leaved upland forest, lower montane coniferous forest, riparian forest. From 3,000 to 5,000 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species. Known to occur within the watershed on Grouse Creek nearly Mineral Point, and in six additional locations in the Devil Peak, Greek Store, and Michigan Bluff USGS 7.5" quads. The exact locations for these six populations were not disclosed, due to the sensitivity of the data.
<i>Lomatium stebbinsii</i>	Stebbin's lomatium	–	–	1B.1	March–May	Chaparral, lower montane coniferous forests, and yellow pine forests. Volcanic or gravelly soils. From 3,750 to 5,850 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species. Known to occur within the watershed in the following locations: <i>Bunker Hill USGS 7.5" quad</i> : 1 population in the vicinity of the north side of the North Fork Long Canyon Creek, ~ 2 miles south of the French Meadows Dam; and <i>Robbs Peak USGS 7.5" quad</i> : approximately 4 populations along Nevada Point Ridge, W-NW of the confluence of the North and South forks of the Rubicon River.
<i>Lupinus dalesiae</i>	Quincy lupine	FSS ²	–	1B.2	May–August	Lower and upper montane coniferous forests. From 3,000 to 8,000 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Meesia triquetra</i>	Three-ranked hump moss	FSS ³	–	4.2	N/A	In acidic montane meadows. From 4,250 to 8,500 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Meesia uliginosa</i>	Broad-nerved hump moss	FSS ³	–	2.2	N/A	In bogs and rock fissures, lower montane coniferous forests, and in meadows and seeps. From 4,250 to 9,500 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Mielichhoferia elongata</i>	Elongate copper-moss	FSS ²	–	2.2	N/A	Cismontane woodland, rock with copper/heavy metals. From 1,500 and 4,250 feet in elevation	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Monardella folletti</i>	Follett's mountainbalm	FSS ²	–	1B.2	June–September	Lower montane coniferous forests in rocky, serpentine soils. From 1,650 to 6,550 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Ophioglossum pusillum</i>	Northern adder's tongue	–	–	2.2	July	Margins of marshes and swamps and mesic areas of Valley and foothill grasslands. From 3,280 to 6,500 feet in elevation	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Packera layneae</i>	Layne's ragwort	FT FSS ¹	SR	1B.2	April–July	Chaparral and cismontane woodland. From 650 to 3,400 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species. There is a known occurrence of this species in the watershed near Bear Creek Road, 2 miles SE of Georgetown.
<i>Penstemon personatus</i>	Close-throated beardtongue	FSS ²	–	1B.2	June–September	Chaparral and upper and lower montane coniferous forests. From 3,400 to 7,000 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Phaeocollybia olivacea</i>	Olive phaeocollybia	FSS ²	–	–	fruiting from October–December	No elevation restrictions. Older forests.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Pyrrocoma lucida</i>	Sticky goldenweed	FSS ²	–	1B.2	July–October	Great Basin scrub, lower montane coniferous forest, and meadows and seeps. May grow in alkaline clays. From 2,250 to 6,250 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Rorippa subumbellata</i>	Tahoe yellow cress	FC	SE	1B.1	May–September	Lower montane coniferous forests, meadows and seeps, sandy (granitic) lake margins. From 6,050 to	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.

Table 7-1. Special-Status Plant Species of the Middle Fork American River Watershed.

Scientific Name	Common Name	Federal Status	State Status	CNPS List	Blooming Period/Fertile	Habitat	Occurrence Notes
		FSS ¹				6,250 feet in elevation.	
<i>Scutellaria galericulata</i>	Marsh skullcap	–	–	2.2	June–September	Lower montane coniferous forest, marshes and swamps, meadows and seeps. From 0 to 6,900 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
<i>Tauschia howelli</i>	Howell's tauschia	FSS ²	–	1B.3	June–August	Subalpine /upper montane coniferous forest, granitic, gravelly soils. From 5,500 to 8,500 feet in elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevation range of this species.
Special-Status Plants Unlikely to Occur Within FERC Project Boundaries							
<i>Arabis rigidissima</i> var. <i>demota</i>	Trinity Mountain rockcress	FSS ²	–	1B.2	August	Broad-leaved upland forest, and upper montane coniferous forest in rocky soils. From 7,500 to 8,500 feet in elevation.	FERC Project boundaries are outside the known elevation range of this species.
<i>Draba asterophora</i> var. <i>asterophora</i>	Lake Tahoe draba	FSS ¹	–	1B.3	July–August	Subalpine coniferous forest and alpine boulder and rock fields in the high Sierra Nevada. From 8,000 to 11,500 feet in elevation.	FERC Project boundaries are outside the known elevation range of this species.
<i>Draba asterophora</i> var. <i>macrocarpa</i>	Cup Lake draba	FSS ¹	–	1B.3	July–August	Subalpine coniferous forests and rock crevices. From 8,000 to 9,000 feet in elevation.	FERC Project boundaries are outside the known elevation range of this species.
<i>Lewisia longipetala</i>	Long-petaled lewisia	FSS ³	–	1B.3	July–August	Alpine boulder and rock fields and subalpine coniferous forests, crevices in granitic rock. From 8,000 to 9,600 feet in elevation.	FERC Project boundaries are outside the known elevation range of this species.
<i>Sphaeralcea munroana</i>	Munroe's desert mallow	–	–	2.2	May–June	Great Basin scrub, about 6,000 feet in elevation.	Unlikely to occur. Known from Squaw Creek in Placer County only, to the north of the watershed.

LEGEND:

Federal Status

FT = Federal Threatened

FE = Federal Endangered

FC = Federal Candidate

FSS¹ = Forest Service Sensitive, Eldorado National ForestFSS² = Forest Service Sensitive, Tahoe National ForestFSS³ = Forest Service Sensitive, Eldorado and Tahoe National ForestsState Status

SR = listed by California as Rare

ST = California Threatened

SE = California Endangered

CNPS Status (California Native Plant Society)

1B = rare, threatened or endangered in California and elsewhere.

2 = rare in California but more common elsewhere.

3 = need more information

4 = plants of limited distribution; a watch list.

_.1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)

_.2 = Fairly endangered in California (20-80% occurrences threatened)

_.3 = Not very endangered in California (<20% of occurrences threatened or no current threats known)

Table 7-2. Noxious Weed Species Known or Potentially Occurring in the Middle Fork American River Watershed.

Noxious Weed Species Known to Occur the Middle Fork American River Watershed			
Scientific Name	Common Name	Cal-IPC Rating¹	C DFA Rating²
<i>Aegilops triuncialis</i>	barbed goatgrass	High	B
<i>Agrostis stolonifera</i>	creeping bent grass	Limited	—
<i>Ailanthus altissima</i> ⁴	tree-of-heaven	Moderate	C
<i>Bromus diandrus</i>	ripgut brome	Moderate	—
<i>Bromus tectorum</i> ^{3,4}	cheatgrass	High	—
<i>Centaurea maculosa</i>	spotted knapweed	High	A
<i>Centaurea solstitialis</i>	yellow starthistle	High	C
<i>Chondrilla juncea</i>	rush skeletonweed	Moderate	A
<i>Cirsium vulgare</i>	bull thistle	Moderate	C
<i>Cynosurus echinatus</i>	hedghegog dogtailgrass	Moderate	—
<i>Cynodon dactydon</i>	bermudagrass	Moderate	C
<i>Cytisus scoparius</i>	Scotch broom	High	C
<i>Dactylis glomerata</i>	orchardgrass	Limited	—
<i>Foeniculum vulgare</i>	fennel	High	—
<i>Hirschfeldia incana</i>	Jim Hill mustard	Moderate	—
<i>Hypericum perforatum</i> ^{3,4}	klamathweed	Moderate	C
<i>Lepidium latifolium</i>	perennial pepperweed (tall whitetop)	High	B
<i>Melilotus officinalis</i>	yellow sweetclover	—	—
<i>Plantago lanceolata</i>	English plantain	Limited	—
<i>Robina pseudiacacia</i>	black locust	Limited	—
<i>Rubus discolor</i>	Himalayan blackberry	High	—
<i>Rumex acetosella</i>	sheep sorrel	Moderate	—
<i>Taeniatherum caput-medusae</i>	medusahead	High	C
<i>Verbascum thapsus</i>	woolly mullein	Limited	—
<i>Vulpia myuros</i>	rat-tail fescue	Moderate	—
Noxious Weed Species Potentially Occurring the Middle Fork American River Watershed			
Scientific Name	Common Name	Cal-IPC Rating¹	C DFA Rating²
<i>Acroptilon repens (Centaurea repens)</i> ⁴	Russian knapweed	Moderate	B
<i>Cardaria chalapense</i> ⁴	whitetop	Moderate	—
<i>Cardaria draba</i> ⁴	heart podded whitetop	Moderate	B
<i>Cardaria pubescens</i> ³	hairy whitetop	Limited	B
<i>Carduus nutans</i> ^{3,4}	musk thistle	Moderate	—
<i>Carduus pycnocephalus</i> ⁴	Italian thistle	Moderate	C
<i>Carthamus lanatus</i> ³	woolly distaff thistle	Moderate	B
<i>Centaurea diffusa</i> ^{3,4}	diffuse knapweed	Moderate	A
<i>Centaurea melitensis</i> ^{3,4}	Malta starthistle (tocalote)	Moderate	C
<i>Cirsium arvense</i> ^{3,4}	Canada thistle	Moderate	B
<i>Conium maculatum</i> ⁴	poison hemlock	Moderate	—
<i>Euphorbia oblongata</i> ^{3,4}	eggleaf (oblong) spurge	Limited	B
<i>Festuca arundinaceae</i>	tall fescue	Moderate	—
<i>Genista monspessulana</i> ^{3,4}	French broom	High	C
<i>Halogeton gomeratus</i> ³	Halogeton	Moderate	A
<i>Hydrilla verticillata</i> ³	hydrilla	High	A
<i>Isatis tinctoria</i> ³	dyer's woad	Moderate	—
<i>Lathyrus latifolius</i> ⁴	perennial sweet pea	—	—
<i>Leucanthemum vulgare</i> ⁴	ox-eye daisy	Moderate	—
<i>Linaria genistifolia</i> ssp. <i>dalmatica</i> ^{3,4}	Dalmatian toadflax	Moderate	A
<i>Lychnis coronaria</i> ⁴	rose campion	—	—
<i>Lythrum salicaria</i> ^{3,4}	purple loosestrife	High	B
<i>Melilotus albus</i> ⁴	white sweet clover	—	—
<i>Myriophyllum spicatum</i> ³	Eurasian water milfoil	High	C
<i>Onopordum acanthium</i> ssp. <i>acanthium</i> ^{3,4}	Scotch thistle	High	A

Table 7-2. Noxious Weed Species Known or Potentially Occurring in the Middle Fork American River Watershed (continued).

Noxious Weed Species Potentially Occurring the Middle Fork American River Watershed			
Scientific Name	Common Name	Cal-IPC Rating¹	CDFA Rating²
<i>Salsola tragus</i> ⁴	Russian thistle	Limited	C
<i>Silybum marianum</i> ⁴	milk thistle	Limited	—
<i>Spartium junceum</i> ^{3, 4}	Spanish broom	High	—
<i>Torilis nodosa</i> ⁴	hedge parsley	Moderate	—
<i>Ulex europaeus</i> ³	gorse	High	B

Cal-IPC Rating:

High - These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate - These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited - These species are invasive but their ecological impacts are minor on a statewide level, or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

CDFA Rating:

A-rated pests: Weeds of known economic significance, subject to action by CDFA including eradication, quarantine, containment, rejection of shipments, or other holding action at the state-county level. Quarantine interceptions are to be rejected or treated at any point in the state.

B-rated pests: Weeds subject to action by CDFA only when found in a nursery, and otherwise subject to eradication, containment, control, or other holding action at the discretion of the local county agricultural commissioner.

C-rated pests: Not subject to state action except to provide for general pest cleanliness in nurseries; reject by CDFA only when found in a cropseed for planting or at the discretion of the commissioner, action to retard spread outside of nurseries at the discretion of the county agricultural commissioner.

¹Source: California Invasive Plant Inventory (Cal-IPC 2006).

²Source: Noxious Weed Pest Ratings (CDFA 2007).

³Source: Tahoe National Forest Weed List (USDA-FS 2006)

⁴ Source: Eldorado National Forest Noxious Weed Species List (USDA-FS 2005)

Table 7-3. Vegetation Alliances and Associated Wildlife Habitats in the Middle Fork American River Watershed.

CalVeg Vegetation Alliance ¹	CalVeg Code	CWHR Wildlife Habitat ²
Alpine Grasses/Forbs	AC	Alpine Dwarf Shrub
Annual Grasses/Forbs	HG	Annual Grass
Barren	BA	Barren
Gray Pine	PD	Blue Oak–Foothill Pine
Blue Oak	QD	Blue Oak Woodland
Knobcone Pine	KP	Closed Cone Pine–Cypress
Pacific Douglas-Fir	DF	Douglas-Fir
Douglas-Fir–Pine	DP	Douglas-Fir
Jeffrey Pine	JP	Jeffrey Pine
Lodgepole Pine	LP	Lodgepole Pine
Ceanothus Chaparral	CC	Mixed Chaparral
Scrub Oak	CS	Mixed Chaparral
Huckleberry Oak	CH	Montane Chaparral
Upper Montane Mixed Shrub	CM	Montane Chaparral
Lower Montane Mixed Chaparral	CQ	Montane Chaparral
Upper Montane Mixed Chaparral	CX	Montane Chaparral
Interior Mixed Hardwoods	NX	Montane Hardwood
Canyon Live Oak	QC	Montane Hardwood
Black Oak	QK	Montane Hardwood
Interior Live Oak	QW	Montane Hardwood
Montane Mixed Hardwoods	TX	Montane Hardwood
Mixed Riparian Hardwoods	NR	Montane Riparian
Willow	QO	Montane Riparian
Willow–Alder	QY	Montane Riparian
Mountain (Thinleaf) Alder	TA	Montane Riparian
Ponderosa Pine	PP	Ponderosa Pine
Mixed Conifer–Giant Sequoia	MB	Sierran Mixed Conifer
Mixed Conifer–Fir	MF	Sierran Mixed Conifer
Mixed Conifer–Pine	MP	Sierran Mixed Conifer
Red Fir	RF	Red Fir
White Fir	WF	White Fir
Wet Meadow	HJ	Wet Meadow

¹Source: <http://www.fs.fed.us/r5/rsl/projects/classification/system.shtml>

²Source: http://www.dfg.ca.gov/whdab/html/wildlife_habitats.html

Table 7-4 Northern Goshawk and California Spotted Owl PACs within the FERC Project Boundary.

Project Facility	Northern Goshawk PAC	California Spotted Owl PAC
Small Dams		
Duncan Creek Diversion Dam	X	
South Fork Long Canyon Diversion Dam	X	X
Large Reservoirs		
French Meadows Reservoir	X	X
Water Conveyance Systems		
Surge Chambers and Adits		
Hell Hole-Middle Fork Tunnel Surge Shaft and Tank		X
Brushy Canyon Adit	X	X
Gatehouses and Shafts		
Duncan Creek Gatehouse and Shaft	X	
Penstocks / Butterfly Valvehouses		
Middle Fork Powerhouse Penstock and Butterfly Valve House		X
Powerhouses		
Middle Fork Powerhouse and Switchyards		X
Stream Gages and Weirs		
Duncan Canyon Creek near French Meadows Gage and Weir (USGS No. 14427700)	X	
South Fork Long Canyon below Diversion Tunnel near Volcanoville Gage (USGS No. 11433065)	X	X
Diversion Gages		
South Fork Long Canyon Diversion Tunnel near Volcanoville Gage (USGS No.11433060)	X	X
Project Communication and Powerlines		
Communication/Powerline – Middle Fork Powerhouse to Penstock Butterfly Valve House and Microwave/Radio Repeater Station		X
Powerline – Middle Fork Powerhouse to Middle Fork American River above Middle Fork Powerhouse near Foresthill Gage (USGS No. 11427760)	X	
Project Support Facilities		
Microwave Reflectors and Radio Towers		
Radio Tower and Repeater near Hell Hole-Middle Fork Surge Shaft		X
Project Roads		
Duncan Creek and French Meadows Area		
Duncan Creek Diversion Road	X	
Long Canyon Area		
Spur road to South Fork Long Canyon Diversion	X	X
Interbay Area		
Hell Hole-Middle Fork Tunnel Access Road		X
Hell Hole-Middle Fork Tunnel/Butterfly Valve House (14N55) Access Road		X
Middle Fork Penstock Access Road		X
Interbay Dam Road		X
Ralston-Oxbow Area		
Brushy Canyon Adit Access (FR 14N30)	X	X
Project Trails		
Duncan Creek Gatehouse Access Trail	X	

Table 7-4 Northern Goshawk and California Spotted Owl PACs within the FERC Project Boundary (continued).

	Northern Goshawk PAC	California Spotted Owl PAC
Recreation Facilities		
Coyote Group Campground	X	X
Gates Group Campground		X
Lewis Campground	X	
Poppy Campground		X
Middle Meadows Group Campground	X	X

Table 7-5. Special-Status Terrestrial Wildlife Species of the Middle Fork American River Watershed.

Scientific Name	Common Name	Federal Status	State Status	Habitat	Occurrence Notes
Special-Status Terrestrial Wildlife Known to Occur Within FERC Project Boundaries					
<i>Pandion haliaetus</i>	osprey	—	CSC	Breeds in northern California, associated strictly with large fish-bearing waters, primarily in ponderosa pine and mixed conifer habitats.	Known to occur within FERC Project boundaries. Known nest approximately 330 feet NE of the French Meadows Dam.
<i>Accipiter gentilis</i>	northern goshawk	MIS	CSC	Prefers middle to high elevation, mature, dense conifer forests for foraging and nesting. Casual in foothills during winter, northern deserts in pinyon-juniper woodland, and low elevation riparian habitats.	Known to occur within FERC Project boundaries. Northern goshawk nests and associated PACs intersect with FERC Project boundaries at the following locations: French Meadows Reservoir; Duncan Creek Diversion Dam; South Fork Long Canyon Diversion Dam; Brushy Canyon Adit and Access Road; Middle Fork-Ralston Tunnel
<i>Strix occidentalis occidentalis</i>	California spotted owl	FSS ³ MIS	CSC	Resides in dense, old growth, multi-layered mixed conifer, redwood, Douglas-fir, and oak woodland habitats, from sea level up to approximately 7,600 feet.	Known to occur within FERC Project boundaries. California spotted owl nests and associated PACs intersect with FERC Project boundaries at the following locations: French Meadows Reservoir; North and South Fork Long Canyon Diversion Dams; Middle Fork Interbay; French Meadows- Hell Hole Tunnel; Hell Hole-Middle Fork Tunnel; Interbay Dam Road; Brushy Canyon Adit and Access Road; Middle Fork-Ralston Tunnel
Special-Status Terrestrial Wildlife Potentially Occurring Within FERC Project Boundaries					
<i>Histrionicus histrionicus</i>	harlequin duck	—	CSC	Historic breeding grounds include west slope of the Sierra Nevada along shores of swift, shallow rivers.	Potential (rare) migrant or resident in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species.
<i>Haliaeetus leucocephalus</i>	bald eagle	FT, FPD, MIS	SE CFP	Local winter migrant to various California lakes. Most of the breeding population is restricted to more northern counties. Regular winter migrants to the region. Usually not found at high elevations in the Sierra.	Potential resident in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species. Known to occur in the watershed. Records for this species include Hell Hole Reservoir; Ralston Afterbay; MFAR approximately 3 miles downstream of the Ralston Afterbay Dam; Gerle Creek Divide Reservoir; Rubicon River approximately 2 miles downstream of the confluence with the South Fork Rubicon River; Pilot Creek near its confluence with the Rubicon River; and Otter Creek near its confluence with the MFAR. In addition, a bald eagle was observed in the summer of 2006 at Hell Hole Reservoir (Ransom pers. comm., 2007).
<i>Accipiter cooperii</i>	Cooper's hawk	—	CSC	Breeding resident throughout most of the wooded portion of the state. Breeds in Sierra Nevada foothills, New York Mountains, Owens Valley, and other local areas in southern California. Dense stands of oak and riparian woodland for nesting and grassland for foraging up to 9,000 feet.	Potential visitor in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species.
<i>Aquila chrysaetos</i>	golden eagle	—	CSC CFP	Grasslands and early successional stages of forest and shrub habitats for foraging up to 11,500 feet. Secluded cliffs with overhanging ledges or large trees in open areas with unobstructed views for nesting.	Potential resident in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species. Known from the Tahoe National Forest.
<i>Falco peregrinus anatum</i>	American peregrine falcon	FD, MIS	SE CFP	Very uncommon breeding resident and uncommon as a migrant. Breeds in woodlands, forests, coastal habitats, and riparian areas near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes, or mounds. Active nesting sites are known along the coast, in the Sierra Nevada, and in the mountains of northern California. Migrants occur along the coast and the western Sierra Nevada in spring and fall.	Potential resident in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species.
<i>Strix nebulosa</i>	great gray owl	FSS ³ MIS	SE	Nests in old-growth coniferous forests and forages in montane meadows. Distribution includes high elevations of the Sierra Nevada and Cascade Ranges from 4,500 to 7,500 feet.	Potential migrant in appropriate habitat. Great gray owls are not known to breed in the vicinity of FERC Project boundaries. Breeding populations in California are concentrated in Del Norte, Humboldt, Siskiyou, and Modoc counties, with smaller, isolated breeding populations also occurring in the central Sierra Nevada. The nearest CNDDDB record is 30 miles south near Leoni Meadows in the ENF (CNDDDB 2007).
<i>Cypseloides niger</i>	black swift	—	CSC	Nests in moist crevices or caves, or on cliffs near waterfalls in deep canyons. Forages widely over many habitats; seems to avoid arid regions.	Potential summer (breeding) resident in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species. Known to occur in the watershed. A CNDDDB report for this species includes Grouse Creek, a tributary to the North Fork of the Middle Fork American River (CNDDDB 2007).

Table 7-5. Special-Status Terrestrial Wildlife Species of the Middle Fork American River Watershed (continued).

Scientific Name	Common Name	Federal Status	State Status	Habitat	Occurrence Notes
Special-Status Terrestrial Wildlife Potentially Occurring Within FERC Project Boundaries (continued)					
<i>Chaetura vauxi</i>	Vaux's swift	—	CSC	Prefers redwood and Douglas-fir habitats with nest sites in large, hollow trees and snags, especially tall, burned-out stubs. Forages over moist terrain and habitats, preferring rivers and lakes.	Potential summer (breeding) resident in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species.
<i>Empidonax traillii (brewsteri)</i>	willow flycatcher	FSS ³ MIS	SE	Wet meadow and montane riparian habitats from 2,000 to 8,000 feet. Most often occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows.	Potential summer (breeding) resident in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species.
<i>Dendroica petechia brewsteri</i>	yellow warbler	—	CSC	Breeds in riparian woodlands from coastal and desert lowlands up to 8,000 feet in the Sierra Nevada. Also breeds in montane chaparral, open ponderosa pine, and mixed conifer habitats with substantial amounts of brush.	Potential summer (breeding) resident in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species.
<i>Lasiurus blossevillii</i>	Western red bat	FSS ³	—	Occurs from British Columbia to South America. In California, occurs from Shasta County to the Mexican border west of the Sierra crest. Roosts solitarily in foliage in forests and woodlands from sea level up through mixed coniferous forest. In California known to roost in cottonwood and willow.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species.
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	FSS ³	CSC	Found in all but alpine and subalpine habitats; most abundant in mesic habitats. Requires caves, mines, tunnels, buildings, or other man-made structures for roosting. This species is extremely sensitive to disturbance and may abandon a roost if disturbed.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species.
<i>Antrozous pallidus</i>	pallid bat	FSS ³	CSC	Inhabits grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests. Typically roosts in caves, crevices, or mines. Requires open habitat for foraging.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species. Known to occur in the watershed. Data from W. Clevenger's 2003 study includes occurrences of this species in the vicinity of French Meadows Reservoir and on Duncan Creek upstream of the Duncan Creek Diversion (Clevenger 2005).
<i>Euderma maculatum</i>	spotted bat	—	CSC	Habitats range from arid deserts and grasslands through mixed conifer forests up to 10,600 feet. Prefers sites with adequate roosting habitat, such as cliffs. Often limited by the availability of cliff habitat. Feeds over water and along marshes.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species. Known to occur in the watershed. Data from W. Clevenger's 2003 study includes an occurrence of this species in the TNF. No GPS information is available for this record (Clevenger 2005).
<i>Eumops perotis californicus</i>	greater western mastiff bat	—	CSC	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, chaparral, desert scrub, and urban areas. Typically roosts in caves, crevices, or other rock formations. Requires open areas for foraging. Found mostly below 4,000 feet in elevation in the lower and upper desert scrub near cliffs, preferring rugged canyons with abundant crevices.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species.
<i>Aplodontia rufa californica</i>	Sierra Nevada sewellel (mountain beaver)	—	CSC	Occurs in dense riparian and open brushy stages of most forest types. Deep, friable soils are required for burrowing along cool, moist microclimates. Live in burrows located in or near deep soils near streams and springs. Typical habitat in the Sierra is montane riparian.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species. Recorded occurrence east of Duncan Peak.
<i>Bassariscus astutus</i>	ringtail	—	CFP	Found in most forest and shrub habitats in close association with rock and/or riparian areas, usually not more than .6 miles from water. Dens in hollow trees, snags, or other cavities.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species.
<i>Martes americana (sierrae)</i>	American marten (Sierra marten)	FSS ³ MIS	—	Optimal habitats are various mixed evergreen forests with more than 40% crown closure and large trees and snags for den sites. Most commonly found in red fir and lodgepole pine forests between 4,000 and 10,600 feet elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species. Known to occur within the watershed. A CNDDDB report (polygon) for this species includes portions of Duncan Creek Diversion Road.
<i>Martes pennanti (pacific)</i>	Pacific fisher	FC, FSS ³ MIS	—	Suitable habitat consists of large areas of mature, dense forest such as red fir, lodgepole pine, ponderosa pine, mixed conifer, and Jeffery pine forests with snags and greater than 50% canopy closure. Known from 4,000 to 8,000 ft elevations in the Sierra National Forest.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species. Two recorded occurrences in the vicinity of French Meadows Reservoir, including one occurrence ~ 1 mile east of French Meadows Reservoir, near the Forest Service Station. However, this species is now thought to be absent from the central Sierra Nevada (Zielinski et al. 2005).

Table 7-5. Special-Status Terrestrial Wildlife Species of the Middle Fork American River Watershed (continued).

Scientific Name	Common Name	Federal Status	State Status	Habitat	Occurrence Notes
Special-Status Terrestrial Wildlife Potentially Occurring Within FERC Project Boundaries (continued)					
<i>Gulo gulo luteus</i>	California wolverine	—	ST CFP	Mixed conifer, red fir, and lodgepole habitats, and probably sub-alpine conifer, alpine dwarf shrub, wet meadow, and montane riparian habitats. Occurs in the Sierra Nevada from 4,300 to 10,800 feet. Majority of recorded sightings are found above 8,000 feet elevation.	May occur in appropriate habitat. FERC Project boundaries are within the known geographic and elevational range of this species. However, this species is extremely rare in California.
Special-Status Terrestrial Wildlife Unlikely to Occur Within FERC Project Boundaries					
<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	FT FPD	—	Elderberry shrubs throughout the Central Valley and foothills below 3,000 feet elevation.	Unlikely to occur. Elderberry shrubs were not detected in recent surveys conducted below 3,000 feet in elevation
<i>Branta canadensis leucopareia</i>	Aleutian Canada goose	FD	—	(wintering) Winters on lakes and inland prairies. Forages on natural pasture or that cultivated to grain; loafs on lakes, reservoirs, ponds.	Unlikely to occur. FERC Project boundaries are outside the known geographic and elevational range of this species.
<i>Buteo swainsoni</i>	Swainson's hawk	—	ST	Uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. Riparian woodlands, juniper-sage flats, and oak woodlands for nesting. Grasslands and agricultural areas for foraging.	Unlikely to occur. FERC Project boundaries are outside the known geographic range of this species.
<i>Buteo regalis</i>	ferruginous hawk	—	CSC	(wintering) Open grasslands, sagebrush flats, desert scrub, low foothills & fringes of pinyon-juniper habitats. mostly eats lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	Unlikely to occur. FERC Project boundaries are outside the known geographic range of this species.
<i>Athene cunicularia hypugaea</i>	western burrowing owl	—	CSC	Year-long resident of open, dry grassland and desert habitats and in grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitats up to 5,300 feet.	Unlikely to occur. FERC Project boundaries are outside the known geographic and elevational range of this species.
<i>Vulpes vulpes necator</i>	Sierra Nevada red fox	MIS	ST	Occurs throughout the Sierra Nevada at elevations above 7,000 feet in forests interspersed with meadows or alpine forests. Open areas are used for hunting, and forested habitats are used for cover and reproduction. Known from the higher elevations of the Sierra National Forest.	Unlikely to occur. FERC Project boundaries are outside the known elevational range of this species.

LEGEND:

Federal Status

FT = Federal Threatened

FE = Federal Endangered

FC = Federal Candidate

FPD = Federal Proposed for Delisting

FD = Delisted Species

FSS¹ = Forest Service Sensitive, Eldorado National ForestFSS² = Forest Service Sensitive, Tahoe National ForestFSS³ = Forest Service Sensitive, Eldorado and Tahoe National Forests

State Status

SR = California Rare

ST = California Threatened

SE = California Endangered

CFP = California Fully Protected

CSC = California Species of Special Concern

Other Lists

MIS = Management Indicator Species

Table 7-6. Game Species of the Middle Fork American River Watershed.

Species	Status	Habitat	General Season	Bag Limit	Possession Limit	Hunting Restrictions
Resident Game Birds						
Blue grouse (<i>Dendragapus obscurus</i>)	MIS	Uncommon to common permanent resident at middle to high elevations. Occurs in open, medium to mature aged stands of fir, Douglas-fir, and other conifer habitats, interspersed with medium to large openings, and available water.	The second Saturday in September extending for 31 consecutive days	2 blue grouse per day	Double the daily bag limit	Hunting license is required. No use of motor vehicles to drive birds toward target. No use of mammal (or imitation) as blind. No take of nests or eggs. No use of practice dogs on birds outside of season. Must use ten-gauge shotgun or smaller, and no shot size larger than BB.
Wild turkey (<i>Meleagris gallopavo</i>)	MIS	Found mostly in deciduous riparian, oak, and conifer-oak woodlands. Prefers rugged, hilly terrain with low to intermediate canopy, interspersed with numerous grass/forb openings, near water.	Fall season - the second Saturday in November extending for 16 consecutive days Spring Season - the last Saturday in March extending for 37 consecutive days	Fall Season: 1 either-sex turkey per day. Spring Season: 1 bearded turkey per day	Fall Season: 1 per season Spring Season: 3 per season	Hunting license is required. No use of motor vehicles to drive birds toward target. No use of mammal (or imitation) as blind. No take of nests or eggs. No use of practice dogs on birds outside of season. Must use ten-gauge shotgun or smaller, and no shot size larger than No. 2.
Mountain quail (<i>Oreotyx pictus</i>)	None	Common to uncommon resident, found typically in most major montane habitats of the state. Found seasonally in open, brushy stands of conifer and deciduous forest, woodland, and chaparral.	Early Season -the second Saturday in September through the Friday prior to the third Saturday in October. General Season - the third Saturday in October extending through the last Sunday in January	10 quail in any combination of species per day 10 quail in any combination of species per day	Double the daily bag limit Double the daily bag limit	Hunting license is required. No use of motor vehicles to drive birds toward target. No use of mammal (or imitation) as blind. No take of nests or eggs. No use practice dogs on birds outside of season. Must use ten-gauge shotgun or smaller, and no shot size larger than BB.
California Quail (<i>Callipepla californica</i>)	None	Common, permanent resident of low and middle elevations. Found in shrub, scrub, and brush, open stages of conifer and deciduous habitats, and margins of grasslands and croplands.	The third Saturday in October through the last Sunday in January	10 quail in any combination of species per day	Double the daily bag limit	Hunting license is required. No use of motor vehicles to drive birds toward target. No use of mammal (or imitation) as blind. No take of nests or eggs. No use practice dogs on birds outside of season. Must use ten-gauge shotgun or smaller, and no shot size larger than BB.
Migratory Game Birds						
Wilson's snipe (<i>Gallinago delicata</i>)	None	Prefers wet areas with organic soil and without tall vegetation. One of the most abundant shorebirds in North America, it is a resident of central and northeastern California.	The third Saturday in October extending for 107 days	8 per day	Double the daily bag limit	Hunting license and state duck tag are required. No use of motor vehicles to drive birds toward target. No use of mammal (or imitation) as blind. No take of nests or eggs. No use practice dogs on birds outside of season. Must use ten-gauge shotgun or smaller, and no shot size larger than BB.
Band-tailed pigeon (<i>Columba fasciata</i>)	MIS	Common resident in hardwood and hardwood-conifer habitats. Inhabits lower slopes of major mountain ranges of the state.	The third Saturday in December extending for 9 consecutive days	2 per day	Double the daily bag limit	Hunting license and state duck tag are required. No use of motor vehicles to drive birds toward target. No use of mammal (or imitation) as blind. No take of nests or eggs. No use of practice dogs on birds outside of season. Must use ten-gauge shotgun or smaller, and no shot size larger than BB.

Table 7-6. Game Species of the Middle Fork American River Watershed (continued).

Species	Status	Habitat	General Season	Bag Limit	Possession Limit	Hunting Restrictions
Migratory Game Birds (continued)						
Mourning dove (<i>Zenaid macroura</i>)	None	Open woodlands, grasslands, croplands, open hardwood, hardwood-conifer, riparian, low elevation conifer, and deserts all provide adequate habitat. Requires a nearby water source.	Sept. 1-15 and from the second Saturday in November extending for an additional 45 days	10 doves of any species per day	Double the daily bag limit	Hunting license and state duck tag are required. No use of motor vehicles to drive birds toward target. No use of mammal (or imitation) as blind. No take of nests or eggs. No use of practice dogs on birds outside of season. Must use ten-gauge shotgun or smaller, and no shot size larger than BB.
Game Mammals						
Sierra Nevada snowshoe hare (<i>Lepus americanus tahoensis</i>)	CSC	An uncommon resident at upper elevations in the Cascade Mts. south through the Sierra Nevada. In California, primarily found in montane riparian habitats with thickets of alders and willows, and in stands of young conifers interspersed with chaparral. The early seral stages of mixed conifer, subalpine conifer, red fir, Jeffrey pine, lodgepole pine, and aspen are likely habitats, primarily along edges, and especially near meadows.	July 1 through the last Sunday in January	5 per day	10 in possession	Hunting license is required. Use of coursing dogs is permitted with rabbits. Must use ten-gauge shotgun or smaller, and no shot size larger than BB.
Western white-tailed jackrabbit (<i>Lepus townsendii townsendii</i>)	CSC	Common throughout the state, except at the highest elevations. Abundant at lower elevations in herbaceous and desert-shrub areas and open, early stages of forest and chaparral habitats.	All Year	no limit	no limit	Hunting license is required. Use of coursing dogs is permitted with rabbits. Must use ten-gauge shotgun or smaller, and no shot size larger than BB.
Western gray squirrel (<i>Sciurus griseus</i>)	MIS	Fairly common locally in mature stands of most conifer, hardwood, and mixed hardwood-conifer habitats in the Klamath, Cascade, Transverse, Peninsular, and Sierra Nevada Ranges. Dependent upon mature stands of mixed conifer and oak habitats. Closely associated with oaks. Require large trees, mast, and snags.	The second Saturday in September through the last Sunday in January	4 per day	4 in possession	Hunting license is required. Must use ten-gauge shotgun or smaller, and no shot size larger than BB.
Coyote (<i>Canis latrans</i>)	None	Occurs in almost all habitats and successional stages. Frequents open brush, scrub, shrub, and herbaceous habitats. Also found in younger stands of deciduous and conifer forest and woodland with low to intermediate canopy, and shrub and grass understory.	All Year	no limit	no limit	Hunting license is required. Must use ten-gauge shotgun or smaller, and no shot size larger than BB.
Black bear (<i>Ursus americanus</i>)	MIS	Widespread, common to uncommon resident occurring from sea level to high mountain regions. Occurs in fairly dense, mature stands of many forest habitats, and feeds in a variety of habitats including brushy stands of forest, valley foothill riparian, and wet meadow.	The fourth Saturday in September until the last day in December or until all tags are filled	1 adult/season/tag	1 adult/season/tag	Requires hunting license and hunting tags. Only bucks may be taken. May use approved rifles, bow and arrow, and approved shotguns. Cubs and females accompanied by cubs may not be taken.
Mountain lion ³ (<i>Felis rufus</i>)	Specially protected mammal, CDFG Code, Chapter 10, Section 4800	Widespread, uncommon permanent resident, ranging from sea level to alpine meadows. Found in nearly all habitats, except xeric regions of the Mojave and Colorado deserts that do not support mule deer populations. Excluded from croplands in the Central Valley. Most abundant in riparian areas and brushy stages of most habitat.	None	N/A	N/A	N/A

Table 7-6. Game Species of the Middle Fork American River Watershed (continued).

Species	Status	Habitat	General Season	Bag Limit	Possession Limit	Hunting Restrictions
Game Mammals (continued)						
Bobcat (<i>Felis rufus</i>)	None	Common to uncommon, permanent resident throughout most of California. Uses nearly all habitats and successional stages. Optimal habitats are brushy stages of low and mid-elevation conifer, oak, riparian, and pinyon-juniper forests, and all stages of chaparral.	Oct. 15 - Feb. 28 (hunting) Nov. 24 - Jan. 31 (trapping)	Bobcats taken under a hunting license and bobcat hunting tags: Five bobcats per season. Bobcats taken under a trapping license: No limit.	Bobcats taken under a hunting license and bobcat hunting tags: Five bobcats per season. Bobcats taken under a trapping license: No limit.	Requires hunting license and hunting tags.
Mule deer (<i>Odocoileus hemionus</i>)	MIS	Common to abundant, yearlong resident or elevational migrant with a widespread distribution throughout most of California, except in deserts and intensively farmed areas without cover. Prefer a mosaic of vegetation, providing an interspersed of herbaceous openings, dense brush or tree thickets, riparian areas, and abundant edge.	The fourth Saturday in September extending for 37 consecutive days	1 buck/ tag	1 buck/ tag	Requires hunting license and hunting tags. May use approved rifles, bow and arrow, approved shotguns, and crossbows. Only bucks with antlers with demonstratable forks (or greater) may be taken.
Furbearing Mammals						
Gray fox (<i>Urocyon cinereoargenteus</i>)	None	Uncommon to common permanent resident of low to middle elevations throughout most of the state. Frequents most shrublands, valley foothill riparian, montane riparian, and brush stages of many deciduous and conifer forest and woodland habitats. Also found in meadows and cropland areas. Suitable habitat consists of shrublands, brushy and open-canopied forests, interspersed with riparian areas, providing water.	Nov. 24 - the last day of Feb.	no limit	no limit	Hunting license is required. May use firearms, bow and arrow, poison under special permit, and approved traps with trapping permit. Dogs permitted.
Raccoon (<i>Procyon lotor</i>)	None	Widespread, common to uncommon permanent resident throughout most of the state. Occurs in all habitats except alpine, and desert types without water; marginal in Great Basin shrub types. Most abundant in riparian and wetland areas at low to middle elevations.	Nov. 16 - Mar. 31	no limit	no limit	Hunting license is required. May use firearms, bow and arrow, poison under special permit, and approved traps with trapping permit. Dogs permitted. When taking raccoon after dark, pistols and rifles not larger than .22 caliber rimfire and shotguns using shot no larger than No. BB may be used
Long-tailed weasel (<i>Mustela frenata</i>)	None	Common to uncommon, permanent resident of most habitats, except xeric brush, shrub, and scrub in the Mojave and Colorado deserts. Mostly uses intermediate cover stages of conifer and deciduous habitats, interspersed with lower seral stages and open forest, woodland areas and shrubs, from sea level to alpine meadows.	All Year	no limit	no limit	Hunting license is required. May use firearms, bow and arrow, poison under special permit, and approved traps with trapping permit. Dogs permitted.
American mink (<i>Mustela vison</i>)	None	Uncommon permanent resident, generally occurring in the northern half of the state. Semiaquatic, inhabiting most aquatic habitats, including some coastal areas. Occurs at elevations up to about 2700 m (9000 ft).	Nov. 16 - Mar. 31	no limit	no limit	Hunting license is required. May use firearms, bow and arrow, poison under special permit, and approved traps with trapping permit. Dogs permitted.
American badger (<i>Taxidea taxus</i>)	None	Badgers are most often found in open, often treeless habitats with an available food source, usually other fossorial mammals. Badgers do not occur in heavily forested areas but inhabit open grasslands, parklands, prairie and cold desert areas.	Nov. 16 - last day of Feb.	no limit	no limit	Hunting license is required. May use firearms, bow and arrow, poison under special permit, and approved traps with trapping permit. Dogs permitted.

Table 7-7. Blue Canyon Mule Deer Fawning Areas, Holding Areas, and Critical Ranges within the FERC Project Boundary.

	Blue Canyon Mule Deer Herd				Pacific Mule Deer Herd		
	Fawning Areas	Holding Areas	Critical Summer Range	Critical Winter Range	Fawning Areas	Critical Summer Range	Critical Winter Range
Project Roads							
Hell Hole Dam Area							
French Meadows-Hell Hole Tunnel Portal Road		X					
Interbay Area							
Hell Hole-Middle Fork Tunnel/Butterfly Valve House (14N55) Access Road		X					
Recreation Facilities							
Ahart Campground			X				
Coyote Group Campground			X				
Gates Group Campground			X				
Lewis Campground			X				
McGuire Boat Ramp			X				
McGuire Picnic Area and Beach			X				
Big Meadows Campground		X					
Hell Hole Campground						X	
Hell Hole Vista		X					

MAPS

APPENDIX 7-A

Vegetation Alliances in the Middle Fork American River Watershed

Herb-Dominated Alliances

Alpine Mixed Grass and Forbs Alliance (AC)

The alpine mixed grass and forbs alliance occurs only in isolated high-elevation regions (peaks and ridgelines) of the Project vicinity above approximately 8,500 feet in elevation. AC is dominated by low-growing perennials and graminoids. Due to high potential evapotranspiration, a short growing season, and abrasion and desiccation by wind, morphological adaptations by some species found in AC are similar to those in the desert. For example, several cushion-forming plants occur within rocky sites. Dominant plant species found may include sedges (*Carex* spp.), bluegrass (*Poa* spp.), and non-native grasses including Italian ryegrass (*Lolium multiflorum*) and perennial ryegrass (*Lolium perenne*). Other species found in this alliance include prostrate sibbaldia (*Sibbaldia procumbens*), rockcress (*Arabis lemmonii*), mountain sorrel (*Oxyria digyna*), Indian paintbrush (*Castilleja lemmonii*), and columbine (*Aquilegia pubescens*).

Annual Grasses and Forbs Alliance (HG)

This alliance is dominated by introduced annual grasses in the genera *Bromus*, *Vulpia*, *Avena*, and *Lolium*. This alliance may occur as a pure patch or as an understory layer in other alliances (e.g., canyon live oak (*Quercus chrysolepsis*) alliance). Native species that may occur include bluegrass, purple needlegrass (*Nassella pulchra*), Idaho fescue (*Festuca idahoensis*), and California poppy (*Eschscholzia californica*).

Wet Meadow (Grass–Sedge–Rush) Alliance (HJ)

The wet meadow alliance occurs in level or gently sloping areas that have moist soils and permanent water sources such as streams, meadows, and lakes. HJ may also occasionally occur as an understory community. Dominant species include sedges and rushes (*Juncus* spp.), as well as water-tolerant grass and forb species.

Shrub-Dominated Alliances

Ceanothus Chaparral (CC)

The ceanothus chaparral alliance occurs in the Sierra Nevada below 4,500 feet in elevation. It is dominated by shrub species of the genus *Ceanothus*. CC also may include, in minor densities, some of the more common mixed chaparral shrubs, such as whiteleaf manzanita (*Arctostaphylos viscida*), chamise (*Adenostoma fasciculatum*), silk-tassel (*Garrya fremontii*), birchleaf mountain mahogany (*Cercocarpus betuloides*), poison oak (*Toxicodendron diversilobum*), and huckleberry oak (*Quercus vaccinifolia*).

Huckleberry Oak Alliance (CH)

The huckleberry oak alliance occurs in the Sierra Nevada on very shallow, stony, or gravelly soils between approximately 3,850 and 9,000 feet in elevation. Stands may be mixed with manzanita (*Arctostaphylos* spp.), bush chinquapin (*Chrysolepis sempervirens*), mountain whitethorn (*Ceanothus cordulatus*), and bitter cherry (*Prunus emarginata*). Conifer species may include Jeffrey pine (*Pinus jeffreyi*), red fir (*Abies*

magnifica), western white pine (*Pinus monticola*), lodgepole pine (*Pinus contorta* var. *murrayana*), and western juniper (*Juniperus occidentalis*).

Upper Montane Mixed Shrub Alliance (CM)

The upper montane mixed shrub alliance occurs within lodgepole pine and Jeffrey pine alliances on exposed ridge tops or in excessively drained soils, typically between 6,000 and 9,000 feet in elevation. Major shrub species include huckleberry oak, creeping snowberry (*Symphoricarpus acutus*), pinemat manzanita (*Arctostaphylos nevadensis*), and bush chinquapin. Minor associates include greenleaf manzanita (*Arctostaphylos patula*), whiteleaf manzanita, bitter cherry, and mountain whitethorn.

Scrub Oak Alliance (CS)

The scrub oak alliance is found intermixed with the lower montane mixed chaparral alliance below about 5,000 feet in elevation on the western edge in the northern Sierra Nevada. CS is dominated by scrub oak (*Quercus berberidifolia*), shrub interior live oak (*Quercus wislizenii* var. *frutescens*), and/or shrub canyon live oak (*Quercus chrysolepis* var. *nana*). Most species of oak in this alliance stump sprout after fire and may fully occupy the site within ten years. Other associated shrubs include birchleaf mountain mahogany, poison oak, and other mesic chaparral species.

Lower Montane Mixed Chaparral Alliance (CQ)

This low-elevation mixed shrub alliance occurs scattered in foothill areas between 750 to 6,350 feet in elevation. CQ includes a mixture of whiteleaf manzanita, common manzanita (*Arctostaphylos manzanita*), wedgeleaf ceanothus (*Ceanothus cuneatus*), lemmon ceanothus, chaparral whitethorn, chamise, Fremont silktassel, birchleaf mountain mahogany, poison oak, various shrub oaks (*Quercus* spp.), hoary coffeeberry (*Rhamnus tomentella*), and other lower elevation shrub species.

Upper Montane Mixed Chaparral Alliance (CX)

The upper montane mixed chaparral alliance is a mixed species shrub type that occurs commonly between 2,200 and 8,900 feet in elevation. Chaparral species such as greenleaf manzanita, mountain whitethorn, snowbrush (*Ceanothus velutinus*), and deerbrush (*Ceanothus integerrimus*) are indicators of this alliance. Whiteleaf manzanita may be present on the west slope foothills at lower elevations of this type, representing a transition between the lower montane mixed chaparral alliance and this alliance.

Mountain (Thinleaf) Alder Alliance (TA)

Mountain or thinleaf alder (*Alnus tenuifolia*) is a dominant high-elevation small tree or tall shrub species, generally occurring in pure stands between 4,100 and 9,020 feet in elevation. TA occurs in large perennial grass and forb meadows where streams and coarse, shallow, or gravelly soils exist. These saturated or seasonally flooded sites are sometimes adjacent to white fir (*Abies concolor*), mixed conifer–fir, and red fir sites. Minor inclusions of tree or shrub willows (*Salix* spp.) or mountain maple (*Acer glabrum*)

may occur in this type, but the density of mountain alder stands limits the growth of other species aside from some aquatic gaminoids and forbs.

Tree-Dominated Alliances

Pacific Douglas-Fir Alliance (DF)

Pacific Douglas-fir (*Pseudotsuga menziesii*) maintains dense stands on north-facing, shaded or moist sites at the same general range of the Douglas-fir–pine alliance, approximately 660 to 4,600 feet in elevation. On the western side of northern Sierra Nevada, species include canyon live oak, black oak (*Quercus kelloggii*), tanoak (*Lithocarpus densiflorus*), and more rarely with tree chinquapin (*Chrysolepis chrysophylla*).

Douglas-Fir–Pine Alliance (DP)

The Douglas-fir–pine alliance occurs below 5,900 feet in elevation, and is characterized by Douglas-fir and ponderosa pine (*Pinus ponderosa*). The shrub alliance most commonly associated with the Douglas-fir–pine alliance is the lower montane mixed chaparral alliance containing wedgeleaf, whiteleaf manzanita, and poison oak.

Jeffrey Pine Alliance (JP)

The Jeffrey pine alliance occurs below approximately 4,000 feet in elevation on localized sites with granitic outcrops or on glaciated soils such as tills and outwash. Shrub species such as wedgeleaf ceanothus, whiteleaf manzanita, coffeeberry (*Rhamnus tomentella* ssp. *tomentella*), and scrub canyon live oak are common under these conditions.

Knobcone Pine Alliance (KP)

Knobcone pine (*Pinus attenuata*) occurs in small dense stands scattered throughout the douglas-fir–pine, mixed conifer–pine, black oak, canyon live oak, mixed conifer–pine, and canyon live oak alliances. This alliance is often a result of past disturbances (usually fire) and is typically associated with whiteleaf manzanita. It usually occurs between approximately 930 to 4,300 feet in elevation on south- or west-facing slopes and is tolerant of ultrabasic parent materials.

Lodgepole Pine (LP)

Lodgepole pine occurs intermingled with the red fir and mixed conifer–fir alliances from approximately 4,450 to 9,000 feet in elevation. It occurs in either dense, pure stands with abundant year-round moisture or as scattered individual trees on very dry soils. On the periphery of meadows, as the water table level drops, lodgepole pine may be invasive and replace the sedge and forb species. The occurrence of persistent lodgepole pine stands generally indicates environmental conditions unfavorable to the establishment and growth requirements of red fir or Jeffrey pine, but they may replace it in time.

Mixed Conifer with Giant Sequoia Alliance (MB)

The mixed conifer with giant sequoia alliance includes giant sequoia (*Sequoiadendron giganteum*) and a mixed conifer overstory dominated by sugar pine (*Pinus lambertiana*), incense cedar (*Calocedrus decurrens*), Douglas-fir, ponderosa pine, and occasionally white fir. Other species may include tanbark oak, mountain dogwood (*Cornus nuttallii*), and western azalea (*Rhododendron occidentale*). Refer to Special-Status Botanical Resources for more information on the occurrence of giant sequoia in the Middle Fork American River Watershed.

Mixed Conifer–Fir Alliance (MF)

The mixed conifer–fir alliance is the high elevation counterpart of the mixed conifer–pine alliance. MF occurs within a range of approximately 3,700 to 8,800 feet in elevation. Three major species define this mixed conifer type: white fir, Jeffrey pine, and lodgepole pine. At lower elevations, mixed conifer pine alliance associates such as Douglas-fir and ponderosa pine may occur. As elevation increases, red fir becomes more prominent. Other associates at all elevations include sugar pine and incense cedar. The upper montane mixed chaparral and occasionally the huckleberry oak alliance are often found adjacent to this alliance.

Mixed Conifer–Pine Alliance (MP)

The mixed conifer–pine alliance occupies moist soils across a range of sites between approximately 1,900 and 7,800 feet in elevation. MP is defined by the presence of several conifer species, including ponderosa pine, incense cedar, Douglas-fir, white fir, and sugar pine, with Jeffrey pine occurring very rarely. Any one of these species may become locally dominant over small areas. Riparian habitats within this alliance are characterized by the presence of white alder, maple, and willow. Understory shrubs in this alliance include deerbrush and whiteleaf manzanita at lower elevations, and greenleaf manzanita at higher elevations.

Mixed Riparian Hardwoods Alliance (NR)

The mixed riparian hardwoods alliance occurs along rivers and streams and includes a mixture of riparian hardwood species with no clearly dominant species. The mixture includes combinations of quaking aspen (*Populus tremuloides*), willow (*Salix* spp.), and black cottonwood (*Populus balsamifera* spp. *trichocarpa*).

Interior Mixed Hardwoods Alliance (NX)

The interior mixed hardwoods alliance occurs below about 3,000 feet in elevation in scattered areas along the western edge in the northern Sierra Nevada. Stands are composed of several species of hardwoods with no clearly dominant species. The stands include any combinations of interior live oak (*Quercus wislizenii*), canyon live oak, valley oak (*Quercus lobata*), or blue oak (*Quercus douglasii*), in addition to shrubs commonly found in the lower montane mixed chaparral alliance such as wedgeleaf

ceanothus (*Ceanothus cuneatus*), poison oak, and whiteleaf manzanita. Trees in the montane mixed hardwoods alliance may be present in the mixture, but do not form the majority elements in the mixture. Overstory conifers mainly include Douglas-fir, ponderosa pine, knobcone pine, and gray pine (*Pinus sabiniana*).

Gray Pine Alliance (PD)

This alliance, dominated by gray pine, occurs primarily in the foothills of the Sierra Nevada, on steep, dry rocky canyons with south aspects, below about 4,200 feet in elevation. These sites are typically diverse in structure, with a mixture of hardwoods such as canyon live oak (*Quercus chrysolepis*), interior live oak and blue oak, and low-elevation chaparral shrubs such as wedgeleaf ceanothus and whiteleaf manzanita, and common manzanita. Patches of annual grasses are often found adjacent to grey pine stands.

Ponderosa Pine Alliance (PP)

The ponderosa pine alliance is defined by pure stands of ponderosa pine. It is commonly found between approximately 900 and 5,800 feet in elevation on moist western slopes in the northern Sierra Nevada. Within the Middle Fork American River Watershed, the ponderosa pine alliance is associated most commonly with the canyon live oak and black oak alliances on south-, east- and west-facing slopes and with Douglas-fir–pine and mixed conifer–pine alliances on north-facing aspects. Shrubs of lower montane areas such as whiteleaf manzanita, wedgeleaf ceanothus, and poison oak also may be commonly found within the ponderosa pine alliance.

Canyon Live Oak Alliance (QC)

Canyon live oak occurs in pure or mixed stands in proximity to the Douglas–fir–pine, mixed conifer–pine, ponderosa pine, and black oak alliances. QC is generally found on relatively dry soils or in steep canyons between approximately 600 and 6,500 feet in elevation in the northern Sierra Nevada. A mixture of shrubs such as wedgeleaf ceanothus, deerbrush, and whiteleaf manzanita often occur in the understory of this alliance.

Blue Oak Alliance (QD)

Blue oak occurs at the eastern edge of its range in pure or mixed stands in the northern Sierras. It is often found adjacent to the gray pine, ponderosa pine, and Douglas-fir–pine alliances on gentle slopes below about 3,300 feet in elevation. On steeper south aspects, interior live oak may become more abundant. In deeper soils, blue oak may be replaced with valley oak. Wedgeleaf ceanothus, whiteleaf manzanita, and poison oak are scattered throughout this alliance.

Black Oak Alliance (QK)

The black oak alliance is one of the most common and wide-ranging hardwood alliances in the Middle Fork American River Watershed. QK is typically found on moist soils up to approximately 7,000 feet in elevation on both west and east slopes of the Sierra

Nevada. QK may occur in pure stands or in mixed stands as an understory component within several different conifer alliances including Douglas-fir–pine, ponderosa pine, mixed conifer–pine, white fir, eastside pine, and mixed conifer–fir. Black oak often grows in mixed stands with canyon live oak creating a mixed hardwoods alliance. Bigleaf maple (*Acer macrophyllum*), dogwood (*Cornus* spp.), white alder, and California bay (*Umbellularia californica*) are common associates in shaded areas and along riparian corridors.

Willow Alliance (QO)

The willow alliance is wide-ranging, extending from approximately 2,100 to 8,600 feet in elevation. Species of tree and shrub willows (*Salix* spp.) dominate the hardwood mixture, and may include Scouler's willow, shining willow, Gooding's black willow, and narrow-leaved willow. QC may occur in pure stands along streams and moist canyon bottoms, or it may be mixed with conifers such as those in the mixed conifer–pine, mixed conifer–fir, and lodgepole pine alliances. Willow–aspen, white alder, and black cottonwood alliances may also be associated with the willow alliance.

Interior Live Oak Alliance (QW)

The interior live oak alliance occurs in semi-open or closed stands between 700 and 3,010 feet in elevation. QW is often associated with ponderosa pine alliances and less commonly with the Douglas-fir–pine alliance. Black cottonwood and white alder are the associated riparian species.

Willow–Alder Alliance (QY)

This alliance generally is found between 3,180 and 6,950 feet in elevation. Willow species, which in this Project vicinity may include Scouler's willow, shining willow, Gooding's black willow, and narrow-leaved willow, occur together with white alder, along streams or seepage areas. Neither taxon is clearly dominant in the riparian mixture. Common associates include species of gooseberry (*Ribes* spp.) and currant (*Ribes* spp.), blackberry (*Rubus* spp.), wild rose (*Rosa* spp.), and poison oak.

Red Fir Alliance (RF)

The red fir alliance generally occurs in dense, pure stands or as an inclusion in the mixed conifer–fir alliance on both east and west slopes of the Sierra Nevada from approximately 7,000 to 9,000 feet in elevation on frigid soils. Few understory plants occur in denser RF stands, although pipsissewa (*Chimaphila menziesii*) and white-veined wintergreen (*Pyrola picta*) may be found. In more open stands or where RF intergrades with the mixed conifer–fir alliance, snowbrush, mountain whitethorn, pinemat manzanita, and greenleaf manzanita are the dominant understory shrubs. Western white pine and lodgepole pine are associated conifer species. Mountain hemlock (*Tsuga mertensiana*) may occur as isolated trees in colder areas of the red fir alliance.

Montane Mixed Hardwoods Alliance (TX)

This alliance is generally found in the northern Sierra Nevada from 500 to 5,400 feet in elevation. It generally occurs on sites favorable to mid-montane conifers such as ponderosa pine and usually above the interior mixed hardwoods sites on the western edge. Species may include any combination of non-dominant black oak, pacific madrone (*Arbutus menziesii*), and/or tree chinquapin. Other species such as canyon or interior live oak may be included, but are not the main species. The principal overstory conifer associates are Douglas-fir, ponderosa pine, incense cedar, and sugar pine.

White Fir Alliance (WF)

Pure stands of white fir are found primarily on the west side of the northern Sierra Nevada from approximately 3,900 to 8,500 feet in elevation. WF occurs typically in cool, moist, shady environments on north aspects, in riparian areas and around large lakes. WF represents an intermediate zone between the mixed conifer–pine and mixed conifer–fir alliances on south and west aspects, and between the mixed conifer–pine and red fir alliances on north and east aspects. Montane mixed chaparral and huckleberry oak alliances are commonly associated shrub types, and mountain alder, black oak, willow, quaking aspen-willow, and black cottonwood are commonly associated hardwood alliances.

Non-vegetated Areas**Barren (BA)**

A barren landscape is defined generally as an area devoid of vegetative cover. BA includes exposed bedrock and cliffs, but it does not include disturbed or developed areas that currently are degraded but could support vegetation under normal circumstances.

APPENDIX 7-B

Life History Information for Special-status Plant Species

Known to Occur or Potentially Occurring within the FERC Project Boundary

Special-status Plants Known to Occur within the FERC Project Boundary¹

Pleasant Valley mariposa lily (*Calochortus clavatus* var. *avius*; FSS, CNPS 1B.2)

Pleasant Valley mariposa lily is a bulbiferous perennial herb in the lily family (Liliaceae) that blooms May through July. It occurs in lower montane coniferous forest on Josephine silt loam and volcanically derived soil, often in rocky areas, at elevations from 1,000 to 6,300 feet.

Red Hills soaproot (*Chlorogalum grandiflorum*; CNPS 1B.2)

Red Hills soaproot is a bulbiferous perennial herb in the lily family (Liliaceae) that blooms May through June. It occurs in chaparral, cismontane woodland, and lower montane coniferous forest, on both serpentine and gabbro substrates, and often on "historically disturbed" sites. It is found at elevations from 800 to 3,500 feet.

Yellow bur navarretia (*Navarretia prolifera* ssp. *lutea*; FSS, CNPS 4.3)

Yellow bur navarretia is an annual herb in the phlox family (Polemoniaceae) that blooms May through July. It occurs in chaparral and cismontane woodland in open areas of well-drained soils on primarily south-facing exposures at elevations from 2,850 to 4,600 feet.

Stebbins's phacelia (*Phacelia stebbinsii*; FSS, CNPS 1B.2)

Stebbins's phacelia is an annual herb in the waterleaf family (Hydrophyllaceae) that blooms June through July. It occurs in cismontane woodland, lower montane coniferous forest, meadows and seeps, and riparian woodland, among rocks and rubble on metamorphic rock benches at elevations from 2,000 to 7,050 feet.

Special-status Plants Potentially Occurring within the FERC Project Boundary

Three-bracted onion (*Allium tribracteatum*; FSS, CNPS 1B.2)

Three-bracted onion is a bulbiferous herb in the lily family (Liliaceae) that blooms April through August. It occurs in chaparral, lower montane coniferous forest and upper montane coniferous forest on volcanic soils. It is found at elevations from 4,000 to 8,000 feet.

Nissenan manzanita (*Arctostaphylos nissenana*; FSS, CNPS 1B.2)

Nissenan manzanita is an evergreen shrub in the heath family (Ericaceae) that blooms February through March. It occurs in closed-cone coniferous forest and chaparral, usually on metamorphic substrate, in association with other chaparral species. It is found at elevations from 1,450 to 3,600 feet.

¹ Life history information was compiled from the following sources: Calflora 2007, CNPS 2007, and Hickman 1993).

Webber's milk-vetch (*Astragalus webberi*; FSS, CNPS 1B.2)

Webber's milk-vetch is a perennial herb in the legume family (Fabaceae) that blooms May through July. It occurs in lower montane coniferous forest on open brushy slopes and flats in xeric areas. It is found at elevations from 2,400 to 3,700 feet.

Flagella-like atractylocarpus (*Atractylocarpus flagellaceus*; CNPS 2.2)

Flagella-like atractylocarpus is a moss in the Dicranaceae family. It occurs in cismontane woodland at elevations from 300 to 1,600 feet.

Big-scale balsamroot (*Balsamorhiza macrolepis var macrolepis*; FSS, 1B.2)

Big-scale balsamroot is a perennial herb in the sunflower family (Asteraceae) that blooms March through June. It occurs in chaparral, cismontane woodland and Valley and foothill grasslands. It is found at elevations from 300 to 4,600 feet.

Red-pored bolete (*Boletus pulcherrimus*; FSS)

Red-pored bolete is a mushroom that fruits from late fall to early winter. It occurs in older-mixed conifer forests and does not have any elevation restrictions.

Upswept moonwort (*Botrychium ascendens*; FSS, CNPS 2.3)

Upswept moonwort is a rhizomatous perennial herb in the adder's-tongue family (Ophioglossaceae) and is fertile July through August. It occurs in lower montane coniferous forest in grassy fields and near springs and creeks. It is found at elevations from 4,800 to 7,300 feet.

Scalloped moonwort (*Botrychium crenulatum*; FSS, CNPS 2.2)

Scalloped moonwort is a rhizomatous perennial herb in the adder's-tongue family (Ophioglossaceae) and is fertile June through July. It occurs in lower montane coniferous forests, and in bogs, fens, freshwater marshes, and moist meadows and near creeks, at elevations from 4,900 to 10,800 feet.

Common moonwort (*Botrychium lunaria*; FSS, CNPS 2.3)

Common moonwort is a rhizomatous perennial herb in the adder's-tongue family (Ophioglossaceae) and is fertile in August. It occurs in meadows and seeps, moist riparian areas, subalpine coniferous forests and upper montane coniferous forests, at elevations from 4,000 to 10,000 feet.

Mingan moonwort (*Botrychium minganense*; FSS, CNPS 2.2)

Mingan moonwort is a rhizomatous perennial herb in the adder's-tongue family (Ophioglossaceae) and is fertile July through September. It occurs in lower and upper montane coniferous forests and moist riparian areas, at elevations from 4,000 to 6,700 feet.

Mountain moonwort (*Botrychium montanum*; FSS, CNPS 2.1)

Mountain moonwort is a rhizomatous perennial herb in the adder's-tongue family (Ophioglossaceae) and is fertile July through August. It occurs in lower montane

coniferous forest, on creek banks in old-growth forest, at elevations from 4,500 to 6,400 feet.

Bolander's bruchia (*Bruchia bolanderi*; FSS, CNPS 2.2)

Bolander's bruchia is a moss in the Bruchianaceae family. It occurs in lower and upper montane coniferous forests and meadows in damp soils, at elevations from 4,000 to 9,500 feet.

Brandegge's clarkia (*Clarkia biloba ssp. brandegeae*; FSS, CNPS 1B.2)

Brandegge's clarkia is an annual herb in the evening primrose family (Onagraceae) that blooms May through July. It occurs in chaparral and cismontane woodland, often in roadcuts, at elevations from 950 to 3,200 feet.

Clustered lady's-slipper (*Cypripedium fasciculatum*; FSS, CNPS 4.2)

Clustered lady's-slipper is a rhizomatous perennial herb in the orchid family (Orchidaceae) that blooms March through July. It occurs in lower montane coniferous forest and North Coast coniferous forest in serpentine seeps and on moist streambanks at elevations from 300 to 7,800 feet.

Mountain lady's-slipper (*Cypripedium montanum*; FSS, CNPS 4.2)

Mountain lady's-slipper is a rhizomatous perennial herb in the orchid family (Orchidaceae) that blooms March through August. It occurs in lower montane coniferous forest and broadleaved upland forest on dry undisturbed slopes at elevations from 750 to 7,700 feet.

Branched collybia (*Dendrocollybia racemosa*; FSS)

Branched collybia is a mushroom in the Tricholomataceae family that fruits from late fall to mid-winter. It occurs in older-mixed conifer forests and does not have elevation restrictions.

Subalpine fireweed (*Epilobium howellii*; FSS, CNPS 1B.3)

Subalpine fireweed is a perennial herb in the evening primrose family (Onagraceae) that blooms July through August. It occurs in wet meadows and subalpine coniferous forest in mossy seeps at elevations from 6,500 to 9,600 feet.

Oregon fireweed (*Epilobium oreganum*; CNPS 1B.2)

Oregon fireweed is a perennial herb in the evening primrose family (Onagraceae) that blooms June through September. It occurs in bogs and fens, meadows, lower montane coniferous forest, and upper montane coniferous forest in and near springs and bogs, and at least sometimes on serpentine. It occurs at elevations from 1,600 to 8,500 feet.

Starved fleabane (*Erigeron miser*; FSS, CNPS 1B.3)

Starved fleabane is a perennial herb in the sunflower family (Asteraceae) that blooms June through October. It occurs in upper montane coniferous forest on rocky, granitic outcrops at elevations from 6,000 to 8,600 feet.

Tripod buckwheat (*Eriogonum tripodum*; FSS, CNPS 4.2)

Tripod buckwheat is a deciduous shrub in the buckwheat family (Polygonaceae) that blooms May through July. It occurs in chaparral and cismontane woodland on gravelly slopes and flats, often on serpentine substrate. It is found at elevations from 650 to 5,250 feet.

Donner Pass buckwheat (*Eriogonum umbellatum* var. *torreyanum*; FSS, CNPS 1B.2)

Donner Pass buckwheat is a perennial herb in the buckwheat family (Polygonaceae) that blooms July through September. It occurs in upper montane coniferous forest, chaparral, and meadows, on steep slopes and ridge tops, rocky, volcanic soils, and usually in bare or sparsely vegetated areas. It is found at elevations from 5,850 to 8,600 feet.

Brook pocket-moss (*Fissidens aphelotaxifolius*; FSS, CNPS 2.2)

Brook pocket-moss is a moss in the Fissidentaceae family. It occurs in lower and upper montane coniferous forests in rock, stream channels and waterfalls, at elevations from 6,500 to 7,200 feet in elevation

Butte County fritillary (*Fritillaria eastwoodiae*; FSS, CNPS 3.2)

Butte County fritillary is a bulbiferous perennial herb in the lily family (Liliaceae) that blooms March through May. It occurs in chaparral, cismontane woodland, and lower montane coniferous forest, usually on dry slopes, but it is also found in wet places. Soils can be serpentine, red clay, or sandy loam. It is found at elevations from 100 to 5,300 feet.

Blandow's bog-moss (*Helodium blandowii*; FSS, CNPS 2.3)

Blandow's bog-moss is a moss in the Helodiaceae family. It occurs in meadows and seeps and subalpine coniferous forests in damp soils, at elevations from 6,500 to 8,900 feet.

Parry's horkelia (*Horkelia parryi*; FSS, CNPS 1B.2)

Parry's horkelia is a perennial herb in the rose family (Rosaceae) that blooms April through June. It occurs in openings in chaparral and cismontane woodland. It is especially known from the lone formation in Amador County. It is found at elevations from 250 to 3,600 feet.

Veined water lichen (*Hydrotheria venosa* (*Peltigera hydrotheria*); FSS)

Veined water lichen is an aquatic lichen in the Peltigeraceae family. It occurs in spring-fed streams with clear, cold water, at elevations from 1,150 to 7,000 feet.

Sierra Valley mousetail (*Ivesia aperta* var. *aperta*; FSS, CNPS 1B.2)

Sierra Valley mousetail is a perennial herb in the rose family (Rosaceae) that blooms from June through September. It occurs in Great Basin scrub, lower montane coniferous forests, meadows and seeps, pinyon and juniper woodlands, vernal pools in

vernally mesic areas, usually in volcanic soils, It occurs at elevations from 4,500 to 7,500 feet.

Dog Valley mousetail (*Ivesia aperta* var. *canina*; FSS, CNPS 1B.1)

Dog Valley mousetail is a perennial herb in the rose family (Rosaceae) that blooms June through August. It occurs in lower montane coniferous forest and meadows in shallow, rocky soil of volcanic origin at elevations from 5,100 to 6,500 feet.

Plumas mousetail (*Ivesia sericoleuca*; FSS, CNPS 1B.2)

Plumas mousetail is a perennial herb in the rose family (Rosaceae) that blooms May through September. It occurs in Great Basin scrub, lower montane coniferous forest, meadows and seeps, and vernal pools, in vernally mesic areas and usually on volcanic substrates at elevations from 4,650 to 7,000 feet.

Webber's ivesia (*Ivesia webberi*; FC, FSS, CNPS 1B.1)

Webber's ivesia is a perennial herb in the rose family (Rosaceae) that blooms May through July. It occurs in lower montane coniferous forest and Great Basin scrub in rocky, volcanic soils at elevations from 3,200 to 6,800 feet.

Cantelow's lewisia (*Lewisia cantelovii*; FSS, CNPS 1B.2)

Cantelow's lewisia is a perennial herb in the purslane family (Portulacaceae) that blooms May through October. It occurs in broadleaved upland forest, chaparral, cismontane woodland, and lower montane coniferous forest on mesic rock outcrops and wet cliffs, usually in moss or clubmoss, and on granitic or sometimes serpentine substrate. This species is found at elevations from 1,050 to 4,400 feet.

Hutchinson's lewisia (subspecies *hutchinsonii*) (*Lewisia kelloggii* ssp. *hutchinsonii*; FSS, CNPS 3.3)

Hutchinson's lewisia (subspecies *hutchinsonii*) is a perennial herb in the purslane family (Portulacaceae) that blooms July through August. It occurs on decomposed granite and slate soils, at the north sides of passes and ridge-tops from elevations of 5,200 to 7,000 feet.

Kellogg's lewisia (*Lewisia kelloggii* ssp. *kelloggii*; FSS)

Kellogg's lewisia is a perennial herb in the purslane family (Portulacaceae) that blooms July through August. It occurs in upper montane coniferous forests and rocky open ridges, at elevations from 5,400 to 9,000 feet.

Saw-toothed lewisia (*Lewisia serrata*, FSS, CNPS 1B.1)

Saw-toothed lewisia is a perennial herb in the purslane family (Portulacaceae) that blooms May through June. It occurs in broadleaved upland forest, lower montane coniferous forest, and riparian forest, on shaded north facing, moss covered, metamorphic rock cliffs. It is found at elevations from 2,950 to 4,700 feet.

Stebbin's lomatium (*Lomatium stebbinsii*; 1B.1)

Stebbin's lomatium is a perennial herb in the carrot family (Apiaceae) that blooms from March through May. It occurs in chaparral, lower montane coniferous forests, and yellow pine forests in volcanic or gravelly soils, at elevations from 3,750 to 5,850 feet.

Quincy lupine (*Lupinus dalesiae*; FSS, CNPS 1B.2)

Quincy lupine is a perennial herb in the legume family (Fabaceae) that blooms May through August. It occurs in lower montane coniferous forest and upper montane coniferous forest on dry, open or shaded slopes, summits, and trails, often in disturbed soils at elevations from 2,300 to 8,200 feet.

Three-ranked hump moss (*Meesia triquetra*; FSS, CNPS 4.2)

Three-ranked hump moss is a moss in the Meesiaceae family. It occurs in acidic montane meadows in coniferous forest, especially in meadows with peat moss (Clines 2001), and bogs, fens, and seeps. It is found at elevations from 4,250 to 8,500 feet.

Broad-nerved hump moss (*Meesia uliginosa*; FSS, CNPS 2.2)

Broad nerved hump moss is a moss in the Meesiaceae family. It occurs in upper montane coniferous forest in meadows and seeps on damp soil at elevations from 4,250 to 9,500 feet.

Elongate copper-moss (*Mielichhoferia elongata*; FSS, CNPS 2.2)

Elongate copper-moss is a moss in the Bryaceae family. It occurs in cismontane woodlands on rock with copper/heavy metals at elevations from 1,500 and 4,250 feet.

Follett's mountainbalm (*Monardella folletti*; FSS, CNPS 1B.2)

Follett's mountainbalm is a shrub in the mint family (Lamiaceae) that blooms June through September. It occurs in lower montane coniferous forest on rocky, serpentine slopes at elevations from 1,650 to 6,550 feet.

Northern adder's tongue (*Ophioglossum pusillum*; 2.2)

Northern adder's tongue is a rhizomatous perennial herb in the adder's-tongue family (Ophioglossaceae) and is fertile in July. It occurs on the margins of marshes and swamps and in mesic areas of Valley and foothill grasslands, from 3,280 to 6,500 feet.

Layne's ragwort (*Packera layneae* (*Senecio layneae*); FT, FSS, SR, 1B.2)

Layne's ragwort is a perennial herb in the sunflower family (Asteraceae) that blooms April through July. It occurs in chaparral and cismontane woodland on ultramafic soil, occasionally along streams, at elevations from 650 to 3,400 feet.

Close-throated beardtongue (*Penstemon personatus*; FSS, CNPS 1B.2)

Close-throated beardtongue is a perennial herb in the figwort family (Scrophulariaceae) that blooms June through September. It occurs in lower montane coniferous forest, upper montane coniferous forest, and chaparral, usually on north-facing slopes in metavolcanic soils at elevations from 3,400 to 7,000 feet.

Olive phaeocollybia (*Phaeocollybia olivacea*; FSS)

Olive phaeocollybia is a mushroom in the Cortinariaceae family that fruits from October through December. It occurs in older forests and does not have elevation restrictions.

Sticky goldenweed (*Pyrrcoma lucida*; FSS, CNPS 1B.2)

Sticky goldenweed is a perennial herb in the sunflower family (Asteraceae) that blooms July through October. It occurs in Great Basin scrub, lower montane coniferous forest, and meadows and seeps on alkaline flats and clay soils at elevations from 2,250 to 6,250 feet.

Tahoe yellow cress (*Rorippa subumbellata*; FC, FSS, SE, CNPS 1B.1)

Tahoe yellow cress is a rhizomatous perennial herb in the mustard family (Brassicaceae) that blooms May through September. It occurs in lower montane coniferous forest and meadows and seeps on sandy beaches, lakeside margins, and in riparian communities on decomposed granite sand at elevations from 6,050 to 6,250 feet.

Marsh skullcap (*Scutellaria galericulata*; CNPS 2.2)

Marsh skullcap is a rhizomatous perennial herb in the mint family (Lamiaceae) that blooms June through September. It occurs in wet places in lower montane coniferous forest, meadows and seeps, and marshes and swamps at elevations from 0 to 6,900 feet.

Howell's tauschia (*Tauschia howelli*; FSS, CNPS 1B.3)

Howell's tauschia is a perennial herb in the carrot family (Apiaceae) that blooms from June through August. It occurs in subalpine/upper montane coniferous forests on granitic, gravelly soils, at elevations from 5,500 to 8,500 feet.

Sources: Calfora, 2007; CNPS, 2007; and Jepson, 1993.

APPENDIX 7-C
Wildlife Habitats and Associated Common Species
in the Middle Fork American River Watershed

Herb-dominated Habitats

Annual Grass

The annual grass habitat corresponds to the annual grasses/forbs (AG) CalVeg alliance. Many wildlife species use annual grasslands for foraging, but some require special habitat features such as cliffs, caves, ponds, or habitats with woody plants for breeding, resting, and cover. The annual grass habitat type hosts a broad diversity of amphibians, such as California slender salamander (*Batrachoseps attenuatus*) and western toad (*Bufo boreas*); reptiles such as western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), western rattlesnake (*Crotalus viridis*), and western skink (*Eumeces skiltonianus*); and rodents such as western harvest mouse (*Reithrodontomys megalotis*), montane vole (*Microtus montanus*), California pocket mouse (*Chaetodipus californicus*), and bushy-tailed woodrat (*Neotoma cinerea*). This diverse vertebrate assemblage attracts a high diversity of predators, particularly wide-ranging raptors such as red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*Buteo lagopus*), ferruginous hawk (*Buteo regalis*), and white-tailed kite (*Elanus leucurus*).

Grassland bird species may include blue grouse (*Dendragapus obscurus*), ring-necked pheasant (*Phasianus colchicus*), and wild turkey (*Meleagris gallopavo*); and passerines may include western kingbird (*Tyrannus verticalis*), western meadowlark (*Sturnella neglecta*), savannah sparrow (*Passerculus sandwichensis*), and grasshopper sparrow (*Ammodramus savannarum*). Mammal species that may occur in annual grass habitats include Bats (*Myotis* spp.), black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Spermophilus beecheyi*), striped skunk (*Mephitis mephitis*), American badger (*Taxidea taxus*), gray fox (*Urocyon cinereoargenteus*), and coyote (*Canis latrans*).

Wet Meadow

Wet meadow habitat corresponds to the wet grasses/forbs (HJ) CalVeg alliance. Wet meadow habitat supports a large number of animal species. Common species that characterize wet meadow habitat include: Pacific chorus frog (*Pseudacris regilla*), western toad, western fence lizard, western aquatic garter snake (*Thamnophis couchii*), common kingsnake (*Lampropeltis getula*), great blue heron (*Ardea herodias*), sora (*Porzana carolina*), American coot (*Fulica americana*), Canada goose (*Branta canadensis*), northern pintail (*Anas acuta*), mallard (*Anas platyrhynchos*), common merganser (*Mergus merganser*), red-tailed hawk, black phoebe (*Sayornis nigricans*), American pipit (*Anthus rufescens*), belted kingfisher (*Ceryle alcyon*), lesser goldfinch (*Carduelis psaltria*), marsh wren (*Cistothorus palustris*), bats (*Myotis* spp.), California vole (*Microtus californicus*), dusky-footed woodrat (*Neotoma fuscipes*), deer mouse (*Peromyscus maniculatus*), American beaver (*Castor canadensis*), western river otter (*Lontra canadensis*), bobcat (*Lynx rufus*), coyote, black bear (*Ursus americanus*), and mule deer (*Odocoileus hemionus*).

Shrub-dominated Habitats

Alpine-Dwarf Shrub

Alpine-dwarf shrub habitat corresponds to the alpine grasses/forbs (AC) CalVeg alliance. This habitat occurs only in isolated high-elevation regions (peaks and ridge lines) of the Project vicinity. Alpine-dwarf shrub habitat is above timberline and is cold, dry, and windy. It supports the fewest number of animal species of all the habitats in the Middle Fork American River Watershed. Species that may occur include Pacific chorus frog, blue grouse, red-tailed hawk, Clark's nutcracker (*Nucifraga columbiana*), common raven (*Corvus corax*), mountain bluebird (*Sialia currucoides*), deer mouse, American pika (*Ochotona princeps*), yellow-bellied marmot (*Marmota flaviventris*), long-tailed weasel (*Mustela frenata*), coyote, mountain lion (*Felis concolor*), and mule deer.

Mixed Chaparral

Mixed chaparral habitat corresponds to the ceanothus chaparral (CC) CalVeg alliance. Mixed chaparral habitat supports many passerines, including: ash-throated flycatcher (*Myiarchus cinerascens*), western kingbird, warbling vireo (*Vireo gilvus*), wrentit (*Chamaea fasciata*), oak titmouse (*Baeolophus inornatus*), California thrasher (*Toxostoma redivivum*), violet-green swallow (*Tachycineta thalassina*), western scrub jay (*Aphelocoma californica*), spotted towhee (*Pipilo maculatus*), and song sparrow (*Melospiza melodia*). Non-passerine birds that may occur include raptors, such as northern pygmy-owl (*Glaucidium gnoma*), peregrine falcon (*Falco peregrinus*), red-tailed hawk, and turkey vulture (*Cathartes aura*); hummingbirds, such as black-chinned hummingbird (*Archilochus alexandri*); and upland game birds, including band-tailed pigeon (*Columba fasciata*) and ring-necked pheasant. Other animals common to mixed chaparral include western fence lizard, alligator lizard (*Elgaria* ssp.), bats (*Myotis* spp.), brush mouse (*Peromyscus boylii*), California ground squirrel, brush rabbit (*Sylvilagus bachmani*), striped skunk, coyote, and bobcat.

Montane Chaparral

Montane chaparral habitat corresponds to four CalVeg alliances found in the Middle Fork American River Watershed, which are the huckleberry oak, upper montane mixed shrub, lower montane mixed chaparral, and upper montane mixed chaparral alliances. Montane chaparral includes a broad diversity of plant species and forms (i.e., may include trees in addition to shrubs). Montane chaparral habitat supports similar animal species as those listed for mixed chaparral habitat (above).

Tree-dominated habitats

Blue Oak – Foothill Pine

Blue oak-foothill pine habitat corresponds to the gray pine (PD) CalVeg alliance. Blue oak-foothill pine woodlands provide breeding habitats for a large variety of wildlife species, although no species is totally dependent on them for breeding, feeding, or cover. Species that may occur include acorn woodpecker (*Melanerpes formicivorus*),

red-shouldered hawk (*Buteo lineatus*), California quail (*Callipepla californica*), California ground squirrel, mule deer, and western fence lizard.

Blue Oak Woodland

Blue oak woodland habitat corresponds to the blue oak (QD) CalVeg alliance. Few details relevant specifically to blue oak woodlands are available but data on wildlife use in blue oak savannahs of the western Sierra Nevada indicates that 29 species of amphibians and reptiles, 57 species of birds, and 10 species of mammals find mature stages of this type suitable or optimum for breeding, assuming that other special habitat requirements are met (Mayer and Laudenslayer 1988). Species that may occur include acorn woodpecker, Cooper's hawk, ash-throated flycatcher, western scrub jay, oak titmouse, bats (*Myotis* spp.), California ground squirrel, mountain lion, and western rattlesnake.

Closed Cone Pine – Cypress

Closed cone pine-cypress habitat corresponds to the knobcone pine (KP) CalVeg alliance. Closed cone pine-cypress habitats have varied vegetative and structural composition that depends on site characteristics, soil type, the age of the stand and the floristic composition. This habitat is typically dominated by a single species of one of the closed-cone pines (i.e. knobcone pine) or cypress and attracts numerous game species, including tree squirrels (*Sciurus* spp.) and band-tailed pigeons (*Columbia fasciata*), and nongame species which make use of this type for feeding and cover. Few species make substantial use of this type as a breeding habitat, although the great horned owl (*Bubo virginianus*) and red-tailed hawk will nest in closed-cone pine forests.

Douglas-fir

Douglas-fir habitat corresponds to the Douglas-fir–ponderosa pine (DP) CalVeg alliance. Douglas-fir habitats have varied vegetative and structural composition that attracts a rich diversity of animal species, which may include California slender salamander, Pacific chorus frog, ensatina (*Ensatina eschscholtzii*), western skink, common garter snake, western rattlesnake, great horned owl, chestnut-backed chickadee (*Poecile rufescens*), golden-crowned kinglet (*Regulus satrapa*), Hutton's vireo (*Hutton's vireo*), hermit warbler (*Dendroica occidentalis*), varied thrush (*Ixoreus naevius*), bats (*Myotis* spp.), Trowbridge's shrew (*Sorex trowbridgii*), deer mouse, raccoon (*Procyon lotor*), Pacific fisher (*Martes pennanti pacifica*), gray fox, bobcat, black bear, and mule deer.

Jeffrey Pine

Jeffrey pine habitat corresponds to the Jeffrey pine (JP) CalVeg alliance. Jeffrey pine habitats are used by many species, including Pacific chorus frog, common garter snake, western rattlesnake, great horned owl, sharp-shinned hawk (*Accipiter striatus*), mountain quail (*Oreortyx pictus*), northern flicker (*Colaptes auratus*), white-headed woodpecker (*Picoides albolarvatus*), pileated woodpecker (*Dryocopus pileatus*), olive-sided flycatcher (*Contopus cooperi*), white-breasted nuthatch (*Sitta carolinensis*), red-

breasted nuthatch (*Sitta canadensis*), brown creeper (*Certhia americana*), common raven (*Corvus corax*), varied thrush (*Ixoreus naevius*), Allen's chipmunk (*Tamias senex*), northern flying squirrel (*Glaucomys sabrinus yukonensis*), striped skunk, common porcupine (*Erethizon dorsatum*), mountain lion, bobcat, and mule deer.

Lodgepole Pine

Lodgepole pine habitat corresponds to the lodgepole pine (LP) CalVeg alliance. Lodgepole pine stands have low structural diversity and have relatively low species diversity (Mayer and Laudenslayer 1988). Many animal species found in lodgepole pine stands are associated with meadow edges. Animal species typical of the Jeffrey pine habitat also are commonly associated with lodgepole pine habitat.

Montane Hardwood

Montane hardwood habitat corresponds to three CalVeg alliances found in the Middle Fork American River Watershed, which are the canyon live oak, California black oak, and interior live oak alliances. Common species that may occur include Pacific chorus frog, western fence lizard, California mountain kingsnake (*Lampropeltis zonata*), great horned owl, western screech owl (*Megascops kennicottii*), Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk, wild turkey, band-tailed pigeon (*Columba fasciata*), downy woodpecker (*Picoides pubescens*), a high diversity of passerines, including Steller's jay (*Cyanocitta stelleri*), oak titmouse (*Baeolophus inornatus*), Townsend's solitaire (*Myadestes townsendi*), hermit thrush (*Catharus guttatus*), purple martin (*Progne subis*), spotted towhee (*Pipilo maculatus*), ruby-crowned kinglet (*Regulus calendula*), white-breasted nuthatch (*Sitta carolinensis*), fox sparrow (*Passerella iliaca*), and dark-eyed junco (*Junco hyemalis*); and mammals, including bats (*Myotis* spp.), deer mouse, bushy-tailed woodrat, western gray squirrel (*Sciurus griseus*), California ground squirrel, raccoon (*Procyon lotor*), porcupine (*Erethizon dorsatum*), mountain lion, black bear, and mule deer.

Montane Riparian

Montane riparian habitat is compositionally and structurally diverse and supports a large number of animal species in the Middle Fork American River Watershed. A reliable perennial water source is an important component in this habitat type, which corresponds to five CalVeg alliances found in the Middle Fork American River Watershed, which are the black cottonwood, white alder, mountain alder, willow, and willow alder alliances. Animal taxa contributing to this high alpha diversity are amphibians, reptiles, and birds. Species commonly occurring in this habitat include Pacific chorus frog, western toad, western fence lizard, western aquatic garter snake, common kingsnake, green heron (*Butorides virescens*), black-crowned night-heron (*Nycticorax nycticorax*), red-tailed hawk, red-shouldered hawk, great horned owl (*Bubo virginianus*), mourning dove (*Zenaida macroura*), downy woodpecker (*Picoides pubescens*), red-breasted sapsucker (*Sphyrapicus ruber*), black phoebe (*Sayornis nigricans*), western wood-peewee (*Contopus sordidulus*), Hutton's vireo (*Hutton's vireo*), Steller's jay (*Cyanocitta stelleri*), tree swallow (*Tachycineta bicolor*), belted kingfisher (*Ceryle alcyon*), lesser goldfinch (*Carduelis psaltria*), black-headed grosbeak

(*Pheucticus melanocephalus*), western tanager (*Piranga ludoviciana*), ruby-crowned kinglet (*Regulus calendula*), Wilson's warbler (*Wilsonia pusilla*), bats (*Myotis* spp.), California vole, dusky-footed woodrat, deer mouse, American beaver, western river otter, bobcat, coyote, black bear, and mule deer.

Ponderosa Pine

Ponderosa pine habitat corresponds to the ponderosa pine (PP) CalVeg alliance. Ponderosa pine habitat supports species similar to those in the Jeffrey pine habitat. Ponderosa pine in some locations is a transitional or migratory habitat for deer and it can provide essential foraging habitat in migration holding areas.

Red Fir

Red fir habitat corresponds to the red fir (RF) CalVeg alliance. Red fir habitats throughout California provide food or cover for at least one season for many animals, and can be considered "very important" for 28 birds and 26 mammals (Mayer and Laydenslauer 1988). Animal species typical of the Jeffrey pine habitat also are commonly associated with red fir habitat. Mesocarnivores are strongly associated with this habitat type (pers. comm. Matt Triggs)

Sierran Mixed Conifer

Sierran mixed conifer habitat corresponds to three CalVeg alliances found in the Middle Fork American River Watershed, which are mixed conifer-giant sequoia, mixed conifer-fir, and mixed conifer-pine. Sierran mixed conifer habitat includes conifer and hardwood species, forming a multilayered, structurally diverse forest. Animal species typical of the Jeffrey pine habitat also are commonly associated with Sierran mixed conifer habitat.

White Fir

White fir habitat corresponds to the white fir (WF) CalVeg alliance. White fir habitats have cool, moist environments in which trees are susceptible to windfall and rot. This provides excellent habitat for snag- and cavity-dependent animal species, as well as insect-gleaning birds. Animal species typical of the Jeffrey pine habitat also are commonly associated with white fir habitat.

Non-Vegetated Habitats

Barren

Barren habitat corresponds to the CalVeg non-vegetated classification barren (BA). Barren habitat types are used by a relatively small number of animal species that use specific structural features of the landscape such as rock ledges and cliffs, canyon walls, rock fields, sand and gravel for cover and breeding. Animals found in this habitat may include western rattlesnake, red-tailed hawk, American kestrel (*Falco sparverius*), turkey vulture, rock wren (*Salpinctes obsoletus*), canyon wren (*Catherpes mexicanus*), loggerhead shrike (*Lanius ludovicianus*), bats (*Myotis* spp.), deer mouse, American pika, yellow-bellied marmot, and ringtail (*Bassariscus astutus*)

APPENDIX 7-D

**Life History Information for Special-status Terrestrial Wildlife Species
Known to Occur or Potentially Occurring within the FERC Project Boundary**

Special-status Terrestrial Wildlife Species Known to Occur within the FERC Project Boundary

Birds

Osprey (*Pandion haliaetus*; CSC)

The osprey occurs along seacoasts, lakes, and rivers, primarily in ponderosa pine and mixed conifer habitats. It preys mostly on fish at or below the water surface, but will also take small mammals, birds, reptiles, amphibians, and invertebrates. Large snags and open trees near large, clear, open waters are required for foraging. The osprey typically swoops from flight, hovers, or perches to catch prey. The osprey breeds primarily in northern California and typically build nests in large conifers, but may also use artificial platforms as nesting areas. The breeding season is from March to September. Nests are built on platforms of sticks at the top of large snags, dead-topped trees, on cliffs, or on human-made structures. A nest may be as much as 250 feet above ground and is usually within 1,000 feet of fish-producing water. Osprey need tall, open-branched "pilot trees" nearby for landing before approaching the nest and for use by young for flight practice. Typically, this species migrates in October south along the coast and the western slope of the Sierra Nevada to Central and South America (Zeiner et al. 1988-1990).

Northern goshawk (*Accipiter gentiles*; CSC)

The northern goshawk inhabits middle to high-elevation mature, dense coniferous forests throughout the east and west sides of the Sierra. It occurs in the foothills during winter, in northern deserts in pinyon-juniper woodland, and in low elevation riparian habitats. Optimal habitat contains trees for nesting, a closed canopy (>50%) for protection and thermal cover, and open spaces allowing maneuverability. In the Sierra Nevada, nesting occurs from 2,500 feet in ponderosa pine-mixed-conifer habitat to 10,000 feet in red pine and lodgepole pine habitat (USDA-FS 2001b). Nest areas, often in trees along drainages, are characterized by dense stands of large diameter trees with interconnected canopies. Nests are usually on north slopes near water in the densest parts of stands, but close to openings and are placed in live trees, but sometimes snags (USDA-FS 2001b). Nests in live trees are usually placed at or just below the lower portion of the canopy in a crotch (USDA-FS 2001b). Nesting season begins in March. The northern goshawk feeds mostly on birds, using snags and dead treetops as observation platforms (Zeiner et al. 1988-1990).

California spotted owl (*Strix occidentalis occidentalis*; FSS, MIS, CSC)

The California spotted owl occurs in dense, old growth, multi-layered mixed conifer, redwood, Douglas-fir, and oak woodland habitats, from sea level up to approximately 7,600 feet. In the Sierra National Forest, this species uses foothill riparian-hardwood, ponderosa pine-hardwood, mixed-conifer forest, red fir forest, and east side pine forest (USDA-FS 2001b). It prefers large trees and high canopy cover for nesting and foraging areas. Foraging is most common in intermediate to late successional forests with greater than 40% canopy cover and a mixture of tree sizes, some larger than 24 inches in dbh (USDA-FS 2001b). Nesting habitat contains a dense canopy cover (>70%) with medium to large trees and a multi-storied structure. This species prefers

stands with significantly greater canopy cover, total live tree basal (base) area, basal area of hardwoods and conifers, and snag basal area for nesting and roosting (USDA-FS 2001b). Nests are located in cavities or broken treetops. Nesting season occurs from February to September.

Special-status Terrestrial Wildlife Species Potentially Occurring within the FERC Project Boundary

Birds

Harlequin duck (*Histrionicus histrionicus*; CSC)

The harlequin duck occurs along coasts in winter, where it dives for food in turbulent water along rocky shores, taking invertebrates from rocks or pilings. It nests along the banks of shallow, swift rivers with plentiful aquatic invertebrates. The nest is often in a recess, sheltered overhead by the stream bank, rocks, woody debris, or low shrubs, usually within 7 feet of water. Pairs form along the coast in winter or early spring. Clutch size is generally 3 to 7, and seldom more than 9. Incubation is 27 to 29 days. Young are precocial and are tended by the hen only. First breeding is at 2 years. Harlequin ducks were known historically to breed along Sierran rivers from Madera to Tuolumne counties. However, with the exception of a few rare breeding pairs and stragglers, the California wintering population of harlequin duck now migrate to breeding grounds in the northwestern U.S. and Canada, and is absent from April to September. Both breeding and wintering populations in California have declined, probably as a result of human disturbance along breeding streams, and damming of rivers (Zeiner et al. 1988-1990).

Bald eagle (*Haliaeetus leucocephalus*; FT, FPD (Proposed delisting on 7/6/99; nesting and wintering), MIS, SE, CFP)

The breeding range of bald eagles formerly included most of the North American Continent, but bald eagles now nest mainly in Alaska, Canada, the Pacific Northwest states, the Great Lake states, Florida, and Chesapeake Bay. The winter range of the bald eagle is similar to the breeding range, but extends mainly from southern Alaska and southern Canada southward. Bald eagles are permanent residents and uncommon winter migrants throughout the state of California. They breed primarily in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity counties (CDFG 2002). The breeding range is primarily in mountainous habitats next to reservoirs, in the Central Coast Range, and on Santa Catalina Island. About half of the wintering population is found in the Klamath Basin (CDFG 2002). Bald eagles forage near large aquatic ecosystems such as lakes, reservoirs, or free flowing rivers. Bald eagle nests are usually located in uneven-aged stands with old-growth components. Nesting usually occurs in large trees along shorelines in relatively remote areas. Breeding occurs February through July, with peak activity occurring in March through June. Average clutch size is 2 eggs. Incubation lasts approximately 35 days and fledging takes place at 11 to 12 weeks of age. Parental care may extend to 11 weeks after fledging. Bald eagles become sexually mature at 4 to 5 years of age.

Bald eagle populations have been on the rise over the past 25 years. There was a ten-fold increase in population from 1963 to 1999. The number of occupied breeding areas

in North America increased by 462 percent from 1974 to 1994. In California, CDFG has coordinated annual statewide breeding surveys of bald eagles which have shown a long term increase in the population and range since surveys began in 1973. The breeding range increased from eight counties in 1981 to 27 counties currently (CDFG 2002).

In 1940, the Bald Eagle Protection Act (16 U.S.C. 668) was passed. This act led to a partial recovery of the species. In the late 1940s, the species population plummeted due to reproductive failure from the widespread use of DDT, loss of habitat, and disturbances related to human activities. In response to this, bald eagles in the lower 48 states were listed as endangered under the Endangered Species Protection Act of 1966 (16 U.S.C. 668aa-668cc). Populations continued to decline and in 1978 bald eagles were listed as endangered under the Endangered Species Act (16 U.S.C. 1531-1544). The USFWS released a recovery plan in 1986. Because of the increase in the bald eagle population and range, the species was downlisted to threatened status in July of 1995 (50 CFR Part 17). A proposed rule to remove the species from listing status was made in July of 1999 (50 CFR Part 17). The bald eagle is also protected under the Migratory Bird Treaty Act of 1918 (16 U.S.C. Sections 703-712) and the Bald Eagle Protection Act of 1940 (16 U.S.C. Sections 668-668d).

Cooper's hawk (*Accipiter cooperi*; CSC)

The Cooper's hawk occurs in dense stands of oak and riparian woodland for nesting and grassland for foraging from sea level to 9,000 feet. It is a breeding resident throughout most of the wooded portion of the state, especially in the southern Sierra Nevada foothills, New York Mountains, Owens Valley, and other local sites in southern California. It feeds on small birds, small mammals, reptiles, and August with peak activity from May through July (Zeiner et al. 1988-1990). Historically, this species' rapid decline in the eastern United States was probably due to pesticides and it is likely that California populations were affected to some extent. Currently, the main potential threat is habitat destruction, mainly in lowland riparian areas. Direct or indirect human disturbance at nest sites can be equally detrimental. Illegal take of nestlings is also a potential threat, especially in populated areas.

Golden eagle (*Aquila chrysaetos*; CSC, CFP)

The golden eagle typically occurs in grasslands and early successional stages of forest and shrub habitats for foraging, and secluded cliffs with overhanging ledges or large trees in open areas for nesting. It is an uncommon permanent resident and migrant throughout California from sea level to 11,500 feet. It eats mostly lagomorphs and rodents, but also takes other mammals, birds, reptiles, and some carrion. It nests on cliffs of all heights and in large trees in open areas by building large platform nests, often 10 feet across and 3 feet high, of sticks, twigs, and greenery. It breeds from late January through August with a peak from March through July (Zeiner et al. 1988-1990).

American peregrine falcon (*Falco peregrinus anatum*; Former FE (Delisted on 8/20/99; nesting), SE, CFP)

The American peregrine falcon breeds in woodlands, forests, coastal habitats, and riparian areas near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes,

or mounds. It is a very uncommon breeding resident and uncommon as a migrant in California, with active nesting areas along the coast north of Santa Barbara, in the Sierra Nevada, and in other mountains of northern California. Migrants occur along the coast and in the western Sierra Nevada in spring and fall. Its nest is a scrape on a depression or ledge in an open area, on human-made structures, and occasionally in a tree or snag cavity or old nest of other raptors. Riparian areas and coastal and inland wetlands are important habitats yearlong, especially in non-breeding seasons. It feeds on a variety of birds and occasionally takes mammals, insects, and fish. Breeding occurs from early March to late August with a clutch size of 3 to 7 eggs. Incubation is approximately 32 days.

The American peregrine falcon was listed as endangered in 1970 under the Endangered Species Conservation Act of 1969 (Public Law 91-135, 83 Stat. 275). Population declines were due to negative impacts of DDT and its metabolites on peregrine falcon reproduction and survival. The American peregrine falcon subspecies were listed as endangered throughout their respective ranges upon passage of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.). Because of restrictions on the use of organochlorine pesticides in the United States and Canada and because of successful management activities, including the reintroduction of captive-bred and relocated wild hatchling peregrine falcons, the species' population has increased. In 1999 the USFWS removed the peregrine falcon in North America from the Federal List of Endangered and Threatened Wildlife species (50 CFR Part 17).

Great gray owl (*Strix nebulosa*; FSS, MIS, SE)

Great gray owls nest in montane mixed conifer and red fir forests, and forage in nearby montane wet meadows, from 2,500 to 8,000 feet in elevation (Beck and Winter 2000). Their distribution includes the Sierra Nevada, Cascade Range, and Modoc Plateau in California, but they are rare throughout California and only isolated populations are known to occur (Beck and Winter 2000). Nesting habitat of the great gray owl consists of mid- or late succession conifer forests containing large, broken-top snags in sufficient numbers to provide nest sites and areas with 60 to 100% multi-storied canopy, situated within 300 yards of montane meadows or grass/forb forage types (Beck and Winter 2000). Foraging habitat requires meadows or openings that have sufficient herbaceous cover to support pocket gophers and microtine rodents and that are at least 10 acres in size (Beck and Winter 2000). Foraging habitat includes meadows and meadow complexes consisting of small "stringer" meadows that total at least 10 acres when meadows occur within ½ mile of one another (Beck and Winter 2000). In the Sierra Nevada of California, nesting generally occurs from February to June in low elevations, March to July in middle elevations, and April to August in high elevations. Nesting chronology is dependent upon elevation, with nesting in high elevation sites occurring more than a month after low elevation sites. The courtship and incubation periods are approximately 30 days each. Great gray owls typically lay only 2 to 3 eggs per clutch, with usually only 1 to 2 chicks successfully fledging. Fledglings leave the nest 26 to 28 days after hatching (Beck and Winter 2000).

Black swift (*Cypseloides niger*; CSC)

The black swift breeds locally in the Sierra Nevada and Cascade Range; the San Gabriel, San Bernardino, and San Jacinto Mountains; and in coastal bluffs and mountains from San Mateo County south to San Luis Obispo County. It nests in moist crevices or caves on sea cliffs above the surf, or on cliffs behind, or adjacent to, waterfalls in deep canyons. It forages widely over many habitats. In migration, it is rare and irregular outside the breeding range and does not winter in California. Nests are constructed of mud mixed with moss, ferns, seaweed, or other plant materials and located in a deep, dark crevice, in a cave, or under an overhang. Nesting occurs in colonies of a few pairs. The breeding season lasts from early June to late August. Only one egg per year is laid, and incubation lasts 24 to 27 days. Altricial young leave the nest at about 45 days (Zeiner et al. 1988-1990).

Vaux's swift (*Chaetura vauxi*; CSC)

The Vaux's swift is a summer resident of northern California, breeding is fairly common in the Coastal Range, in the Sierra Nevada, and possibly in the Cascade Range. It is a fairly common migrant throughout most of California in April, May, August, and September. It feeds high in the air over moist terrain and habitats and also feeds commonly at lower levels in forest openings, above burns, and especially above rivers and lakes. Its preferred habitat is redwood, Douglas-fir, and occasionally other coniferous forest types. Nest sites are typically built on the vertical inner wall of a large, hollow tree or snag, especially tall stubs charred by fire. The species occasionally nests in chimneys and buildings. Breeding occurs from early May to mid-August. Solitary nesting is apparently typical. Clutch size is 3 to 7 eggs, and incubation lasts 18 to 20 days. Altricial young are tended by both parents and leave the nest at about 28 days (Zeiner et al. 1988-1990).

Willow flycatcher (*Empidonax traillii brewsteri*; FSS, MIS, SE)

The willow flycatcher is a rare to locally uncommon, summer resident in wet meadow and foothill and montane riparian habitats from 2,000 to 8,000 feet in the Sierra Nevada and Cascade Range. It occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows. Dense willow thickets are required for nesting and roosting. This species is most abundant in areas where extensive thickets of low, dense willows border wet meadows, ponds, or backwaters. It may still nest elsewhere in lowland California, as in San Diego County. It is a common spring (mid-May to early June) and fall (mid-August to early September) migrant at lower elevations, primarily in riparian habitats throughout the state exclusive of the North Coast. An open cup nest is placed in an upright fork of a willow or other shrub, or occasionally on a horizontal limb, at a height of 1.5 to 10 feet. The species is monogamous. Peak egg laying occurs in June, incubation lasts 12 to 13 days, and clutch size averages 3 to 4 eggs. It is probably single-brooded. Both sexes care for altricial young. Fledging age is 13 to 14 days (Zeiner et al. 1988-1990).

Yellow warbler (*Dendroica petechia brewsteri*; CSC)

The yellow warbler is an uncommon to common summer resident in the north, a locally common resident in the south, and a rare but regular visitor in winter in the south. It

breeds and forages in riparian woodlands, montane chaparral, open ponderosa pine, and mixed conifer habitats with substantial brush, from coastal and desert lowlands up to 8,000 feet in the Sierra Nevada. It also breeds in montane chaparral, in open ponderosa pine, and mixed conifer habitats with substantial amounts of brush. It is now rare to uncommon in many lowland areas where it was formerly common. The species is usually found in riparian deciduous habitats in summer in cottonwoods, willows, alders, and other small trees and shrubs typical of low, open-canopy riparian woodland. The nest is an open cup placed 2 to 16 feet above ground in a deciduous sapling or shrub. The territory often includes tall trees for singing and foraging and a heavy brush understory for nesting. Breeding occurs from mid-April into early August with peak activity in June. The pair breeds solitarily and lays 3 to 6 eggs, which are incubated by the female for 11 days. Altricial young are tended by both parents until fledging at 9 to 12 days (Zeiner et al. 1988-1990).

MAMMALS

Western red bat (*Lasiurus blossevillii*; FSS)

Very little research has been done on the western red bat and little is known about this species. Much of the natural history is inferred from what is known about the eastern red bat, although the degree of similarity of the biology of these two species is unknown at present. The western red bat is a solitary, foliage-roosting bat. The western red bat is in the genus *Lasiurus*, the hairy-tailed bats. These bats are adapted for exposed roosting behavior with their hairy tail membrane and small ears. In California, this species is known to roost in cottonwood trees and willows, but is commonly detected in a variety of habitats, including chaparral. Roost heights range from 10 to 50 feet (Pierson and Heady 1997). The range of the western red bat is from British Columbia to Central and South America. Migration occurs throughout its range and bats of Canada move into the coastal lowlands of California, and the California population is thought to winter in Central America (Nagorsen and Brigham 1993). Mating takes place in late summer and fall, sperm is stored over winter, and fertilization occurs in early spring. Gestation period is 80 to 90 days, and one to four young are born in late May to early July. The young are born small, naked, and underdeveloped (Nowak 1994). Females leave the young at the roosting site while foraging, but will carry them when moving to a new roosting site. Young are capable of sustained flight at 6 weeks. Large moths are the primary prey of the western red bat. This bat is a fast flyer, foraging in straight flights or large circles (Nagorsen and Brigham 1993). The echolocation calls are highly variable, depending on the terrain. Though variable, these calls are very distinct.

Townsend's big-eared bat (*Corynorhinus townsendii*; FSS, CSC)

Townsend's big-eared bat is a year-round resident in California, occurring from low desert to mid-elevation montane habitats. It is found primarily in rural settings, from inland deserts to coastal redwoods, oak woodland of the inner Coast Ranges and Sierra Nevada foothills, and low to mid-elevation mixed coniferous-deciduous forests. It typically roosts during the day in caves and mines, but can roost in buildings that offer suitable conditions (Kunz and Martin 1982). Night roosts are in more open settings and include bridges. It hibernates in mixed sex aggregations of a few to several hundred individuals. Hibernation occurs for prolonged periods in colder areas and intermittently

in non-freezing areas. Townsend's big-eared bat arouses periodically and moves to alternative roosts, and actively forages and drinks throughout the winter. A single young is born per year between May and July. Females form maternity colonies of 35 to 200 individuals, while males roost individually (Kunz and Martin 1982). Townsend's big-eared bat feeds primarily on small moths that are gleaned from vegetation.

Pallid bat (*Antrozous pallidus*; FSS, CSC)

The pallid bat is a year-round resident in California, is found in arid desert areas, grasslands and oak savanna, coastal forested areas, and coniferous forests of the mountain regions of California. Roost sites are typically rock outcroppings, caves, hollow trees, mines, buildings, and bridges (Hermanson and O'Shea 1983). Pallid bats make use of similar structures for night roosting and will use more open sites such as eaves, awnings, and open areas under bridges for feeding roosts. Pallid bats are largely inactive in the winter months, and there is evidence for both hibernation and migration. Hibernation aggregations tend to be much smaller than summer aggregations. Pallid bats have been observed foraging during the winter when prey is available (Hermanson and O'Shea 1983). Copulation occurs in the fall, usually October through December, although in coastal California copulation has been observed as late as February. Females store the sperm, and ovulation occurs the following spring. Parturition timing is determined by local climate, and embryonic development usually takes about nine weeks with birth occurring in May or June. Twins are the norm in northern California, but in other areas the pallid bat is known to have triplets. Maternity colonies range from 20 to 200 individual adult bats. Males roost in much smaller groupings (Hermanson and O'Shea 1983). The pallid bat feeds on large insects (1 to 3 inches in length). Prey is most often caught on the ground. Jerusalem crickets, scorpions, and beetles make up most of the diet of pallid bat in central California.

Spotted bat (*Euderma maculatum*; CSC)

The spotted bat is a rare bat with a discontinuous distribution throughout its range across western North America. In California, this bat is found in the Sierra Nevada and the lower reaches of the Cascade Range (Nagorsen and Brigham 1993). The spotted bat typically roosts in rock crevices in vertical cliff faces, often 325 feet or more in height. The spotted bat is found from below sea level to high elevations in the Sierra Nevada. The distribution of the spotted bat is determined by availability of suitable cliff habitat. The females give birth to a single young in solitary roosts in late spring. Lactating females have been captured in Texas and New Mexico in June and July and as late as August in Utah (Nowak 1994). The diet of the spotted bat consists mainly of moths and other insects caught in flight. Foraging occurs over pine forests, meadows, and marshy areas (Nagorsen and Brigham 1993). Echolocation calls of the spotted bat (6 to 16 kHz) are audible to the human ear and can be heard from distances up to 800 feet.

Greater western mastiff bat (*Eumops perotis californicus*; CSC)

The western mastiff bat has an unusual distribution consisting of two widely separated populations. The northern population occurs from the southwestern United States to Southern Mexico, and the southern population occurs from northern South America to

north central Argentina. In California, this species is found as far north as Butte County, and recent acoustic data has placed it in Shasta County (Pierson 1998). The mastiff bat has been documented in the Sierra Nevada Mountain range at elevations of 7,200 feet and higher in Sequoia National Park and Yosemite National Park (Pierson and Heady 1996). This species is known from Fresno, Tulare, and Mariposa counties (Constantine 1998). Maternity colonies of western mastiff bat are usually small (<100 individuals). Males are often found roosting with the maternity colonies. Roosting sites are typically in crevices high in rock faces in arid places. The mastiff bat in California is found in cultivated areas, in mixed chaparral and live oak, and arid rocky regions where vegetation is sparse. The mastiff bat is not capable of achieving flight from the ground and requires an unobstructed drop to obtain flight speed. In southern California, western mastiff bat is known to roost in buildings and manmade structures (Best et al. 1996). As with most molossid bats, mating occurs in the spring. One young is born from June through August. Dates of reproduction for this species vary more than any North American species, even within one colony. Little is known of the rate of development of the young or the longevity of adults (Best et al. 1996). Prey selection varies with geographic location. In Arizona, diet primarily consists of moths and other soft-bodied insects. A high level of weak flying insects found in guano and the stomachs of individuals suggest that western mastiff bat may forage low to the ground. The presence of diurnal insects suggest that foraging may have taken place at altitudes >3,200 feet where diurnal insects are trapped aloft.

Sierra Nevada sewellel (mountain beaver) (*Aplodontia rufa californica*; CSC)

The Sierra Nevada sewellel (mountain beaver) is found throughout the Cascade, Klamath, and Sierra Nevada ranges. It occurs in dense riparian-deciduous and open, brushy stages of most forest types. Typical habitat in the Sierra Nevada is montane riparian. In the Coast Ranges, most populations occur below 2,700 feet. It frequents open and intermediate-canopy coverage with a dense understory near water. Deep, friable soils are required for burrowing, along with a cool, moist microclimate. Burrows are located in deep soils in dense thickets, preferably near a stream or spring. It lines its nest with dry vegetation. Nest chambers are 1 to 4.5 feet below the ground surface. Breeding occurs from December through March (peak in February). Young are born February to June (peak March through May). There is one litter per year, gestation is 28 to 30 days, and lactation lasts up to 60 days. Litter size averages two to three (Zeiner et al. 1988-1990).

Ringtail (*Bassariscus astutus*; CFP)

The ringtail is distributed in the Sierra Nevada foothills and throughout most of western side of the Sierra Nevada up to 9,600 feet. It occurs in a variety of riparian habitats and in brush stands of most forest and shrub habitats at low to mid-elevations. It forages on the ground, among rocks and in trees usually near water. It is nocturnal and active all yearlong (Zeiner et al. 1988-1990). Young are usually born May to June. There is one litter per year and gestation is 40-50 days. Litter size averages three.

American marten (*Martes americana*; FSS, MIS)

The American marten occurs throughout the Sierra Nevada in montane forests from 4,000 to 13,000 feet. Martens prefer coniferous forest with large diameter trees and snags, large downed logs, moderate-to-high canopy closure, and an interspersed riparian areas and meadows (USDA-FS 2001b). Optimal habitats are various mixed evergreen forests with more than 40 percent crown closure and large trees and snags for den sites. USDA-FS (2001b) provides the following specific habitat components for westside suitable habitat in the marten core elevation range (5,500 to 10,000 feet):

- canopy cover of $\geq 40\%$ for traveling and foraging and of $\geq 70\%$ for denning and resting;
- ≥ 6 largest live conifers of 24" dbh per acre for traveling and foraging and ≥ 9 for denning and resting;
- live tree basal area of ≥ 350 sq ft/acre;
- average of 2.5 largest snags of ≥ 24 " dbh per acre for traveling and foraging and 5 per acre for denning and resting; and
- coarse woody debris of large logs (≥ 15 feet long) for 5–10 tons/acre in Decay Classes 1-3 for traveling and foraging and in Decay Classes 1-2 for denning and resting.

Denning occurs from late winter through early spring. Dens are located in cavities and are lined with leaves, grass, moss, or other vegetation. Young are born in March and leave their mothers in the fall. The American marten ranges from the foothills to the higher slopes of the Sierra Nevada, including the Sierra National Forest.

Pacific fisher (*Martes pennanti pacifica*; FC, FSS, MIS)

The Pacific fisher has been a candidate for federal listing since April 2004. It is among the most habitat-specific mammals in North America (USDA-FS 2001b). Forest type is not as important as vegetative and structural habitat aspects. The Pacific fisher occurs in a variety of forest types that are generally mature, dense forest stands with snags and greater than 40% canopy closure. It is known from 3,500 to 8,000 feet elevations in the Sierra National Forest. It requires standing dead trees, downed logs, and rocky areas for denning sites. USDA-FS (2001b) lists the following key habitat features for Pacific fisher resting and denning sites in the southern Sierra:

- mean den tree dbh of 49" conifer and 27" oak;
- mean rest site tree dbh of 44" conifer and 26" oak;
- mean rest site basal area of 273 sq-ft/acre;
- mean den canopy closure of 94%; and
- mean rest site canopy closure of 93%.

The Pacific fisher dens in cavities and broken treetops and snags from winter to May.

California wolverine (*Gulo gulo luteus*; ST, CFP)

The California wolverine occurs in a variety of habitat types, such as mixed conifer, red fir, and lodgepole habitats, and probably sub-alpine conifer, alpine dwarf shrub, wet meadow, and montane riparian habitats. Wolverine denning is restricted to rocky areas free of human disturbance (USDA-FS 2001b). It occurs in the Sierra Nevada from 4,300 to 10,800 feet, but usually above 6,400 feet. Scarce sightings range from Del Norte and Trinity counties, east through Siskiyou and Shasta counties, and south through Tulare County. The wolverine feeds primarily on small mammals and carrion. Dens are located in caves, cliffs, hollow logs, cavities in the ground, under rocks, under snow, or in old beaver lodges. Denning occurs from late winter through early spring. The breeding period lasts from January to July.