E - ENVIRONMENTAL RESOURCES

5.0 WILDLIFE RESOURCES

5.1 Applicable Laws, Ordinances, Regulations, Statutes and Plans

Wildlife resources in California are protected by a variety of federal, state, and local laws, ordinances, regulations, and statutes. In addition, numerous comprehensive plans and programs have been developed that include detailed policies and guidelines for management of wildlife resources present in the vicinity of the Project. These laws, ordinances, regulations, statutes, programs, and plans and their application to wildlife resources in the Project area are summarized below.

5.1.1 Eldorado National Forest Land and Resource Management Plan, as Amended

The Eldorado National Forest (ENF) Land and Resource Management Plan (LRMP), as amended by the Sierra Nevada Forest Plan Amendment (SNFPA), is discussed in Section E1.1.1. The LRMP addresses fish, botanical, and wildlife resources and associated management strategies throughout the ENF, including the Project area. The LRMP includes a discussion of what kinds and amounts of fish, wildlife, and plant habitat should be protected in the ENF, and a list of Management Indicator Species (MIS) whose presence on ENF lands directs habitat protection and management practices. The management practices are then listed with standards and guidelines for their implementation.

5.1.2 Desolation Wilderness Management Guidelines

The United States Forest Service (USFS) Desolation Wilderness Management Guidelines are described in Section E4.1.2. These guidelines address management of wildlife and their habitat within the Wilderness.

5.1.3 Clean Water Act Section 404 Dredge and Fill Permit

The Clean Water Act (CWA) Section 404 Dredge and Fill Permits are discussed in Section E1.1.2. These permits require that the United States Army Corps of Engineers (USACOE) consult with the United States Fish and Wildlife Service (USFWS) regarding potential impacts of dredge and fill activities on wildlife resources. The USFWS must provide any comments within 90 days to the USACE concerning whether permits should be issued and under what conditions, taking into account the effect of the project on listed species and critical habitat. Section 404 guidelines direct that no permit to discharge dredge or fill material shall be granted if it jeopardizes a listed threatened or endangered species or adversely affects a listed species' critical habitat (40 CFR 230.10, 230.30). Only listed species are covered by this discharge prohibition. The availability of mitigation is not expressly considered but, in practice, a project may be granted a Section 404 permit if it is modified to avoid jeopardy or adverse affects on critical habitat.

5.1.4 Endangered Species Act

The Federal Endangered Species Act (ESA) is discussed in Section E3.1.4. The official federal list of endangered and threatened animals has been reviewed (Federal Register, 50 CFR 17.11) and two federally-listed terrestrial animal species have been identified which are known to occur, or have the potential to occur, in the Project area based on their reported geographic distribution and habitat requirements. These species are the federally listed threatened (FT) valley elderberry longhorn beetle and bald eagle. These species are currently afforded full legal protection under the ESA; however, the bald eagle is currently proposed for removal from the endangered species list (i.e., de-listed) because the species has made a substantial recovery from past population declines. One other terrestrial species, the mountain plover, has been formally proposed for listing as threatened (Federal Register, Volume 64, Number 30: 7587-7601) and has the potential to occur in the Project area. The mountain plover listing is currently under review.

5.1.5 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) is discussed in Section E3.1.6. The FWCA, as amended, authorizes the Secretary of the Interior to provide assistance to and cooperate with, federal, state, and public or private agencies and organizations in the conservation of wildlife and their habitat. The FWCA also requires consultation between the USFWS and the fish and wildlife agencies of states where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted...or otherwise controlled or modified" by any agency under a federal permit or license. Consultation is to be undertaken for the purpose of "preventing loss of and damage to wildlife resources." Provisions of the Act require equal consideration and coordination of wildlife conservation with other water resources development programs.

5.1.6 Federal Protection of Wetlands

Executive Order 11990, which authorizes federal protection of wetlands, is discussed in Section E4.1.6. The order requires federal agencies to consider the potential effects of a proposed project on the survival and quality of wetlands including the conservation and long term productivity of existing faunal species and habitat diversity and stability. Executive Order 11990 does not apply to the issuance by federal agencies of permits, licenses, or allocations to private parties for activities involving wetlands on non-federal lands.

5.1.7 Federal Prevention of Introduction of Invasive Species

As discussed in Section E4.1.7, Executive Order 13112 authorizes Federal agencies to prevent the introduction of invasive species. The Order is intended to prevent the introduction of invasive plant and animal species, and provide for their control, as well as to minimize the economic, ecological, and human health impacts that invasive species cause. Federal agencies whose actions may affect the status of invasive species are required to: 1) identify such actions; 2) use relevant programs and authorities to prevent, control, monitor, and research such species; and 3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the

introduction or spread of invasive species in the United States or elsewhere. Federal agencies must pursue these duties in a manner consistent with the Federal Invasive Species Management Plan (Section 5.1.8).

5.1.8 Federal Invasive Species Management Plan

The Federal Invasive Species Management Plan is discussed in Section E4.1.7. Based on a review of the California Wildlife Habitat Relationships Database (CWHRD) administered by the California Department of Fish and Game (CDFG), at least 15 non-native/alien terrestrial vertebrate animal species known to occur within the Project area have been identified. These include: ring-necked pheasant, wild turkey, rock dove, European starling, brown-headed cowbird, house sparrow, Virginia opossum, beaver, muskrat, black rat, Norway (brown) rat, house mouse, feral cat, wild pig, and feral goat. An official determination as to whether or not all of these species "cause economic or environmental harm or harm to human health," thereby warranting classification as "invasive," has not yet been issued by the Invasive Species Council. However, the brown-headed cowbird is known to be a significant concern in the Sierra Nevada, where they have expanded their range into previously unoccupied areas and adversely affected many native songbirds through brood parasitism.

5.1.9 Federal Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 et seq.), implements treaties between the United States and Great Britain (for Canada), Mexico, Japan, and Russia. Each treaty designates protected bird species and contains a prohibition on taking (i.e., to hunt, take, capture, kill, or possess) any bird, bird parts, nests, or eggs of the species protected by the treaties, or disturbing nest sites. The MBTA provides the federal government with authority to establish regulations on hunting and managing protected birds. The vast majority of native bird species that occur within North America are protected by the MBTA.

5.1.10 Federal Bald Eagle Protection Act

The Bald Eagle Protection Act of 1940, as amended (16 U.S.C. 668 et seq.), provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds. The ESA, MBTA, and California Endangered Species Act (CESA) afford related protections. The Act imposes criminal and civil penalties on anyone (including associations, partnerships, and corporations) in the United States, or within its jurisdiction, that is convicted of violating the regulations issued under the Act. If compatible with the preservation of bald and golden eagles, the Secretary of the Interior may issue regulations authorizing the taking, possession, and transportation of these eagles for scientific purposes, for the protection of wildlife, agricultural, or other interests. The Secretary of the Interior may also permit the taking of golden eagle nests that interfere with resource development (e.g., nests on utility poles/structures) or recovery operations. Bald eagles may not be taken for any purpose unless the Secretary issues a permit prior to the taking.

Golden eagles are distributed widely throughout the Sierra Nevada and are known to occur within the Project area. Bald eagles are regular winter visitors to some of the larger reservoirs and streams in the area and one pair of bald eagles is known to nest currently at Union Valley Reservoir.

5.1.11 Sacramento River-San Joaquin River Water Quality Control Plan

The Sacramento River-San Joaquin River Water Quality Control Plan (Basin Plan) is discussed in Section 2.1.6. The plan specifies that designated beneficial uses of the Middle Fork American River (MFAR) and the South Fork American River (SFAR) include wildlife habitat.

5.1.12 California Endangered Species Act

The California Endangered Species Act (CESA) is discussed in Section E3.1.7. A review of the CESA listing indicates there are nine terrestrial vertebrate wildlife species that are known to occur, or with the potential to occur, in the Project area based on the species' known geographic distribution and habitat requirements. These species include seven birds (bald eagle, Swainson's hawk, American peregrine falcon, greater sandhill crane, great gray owl, willow flycatcher, and bank swallow) and two mammals (Sierra Nevada red fox and California wolverine).

5.1.13 California Department of Fish and Game Section 1601 (Streambed Alteration Agreement)

CDFG's Section 1601 (Streambed Alteration Agreement) is discussed in Section E1.1.3. This agreement requires that the CDFG assess the impacts of activities in the streambed on wildlife resources.

5.1.14 California Wetlands Conservation Policy

The California Wetlands Conservation Policy pursuant to Executive Order W-59-93 is discussed in Section E4.1.14. A goal of this Policy is to establish a framework and strategy that will ensure no overall net loss, and achieve a long-term net gain, in the quantity, quality, and permanence of wetland acreage and values in California. Provision of habitat for wildlife is among the many values of these wetlands.

5.1.15 El Dorado County General Plan

The El Dorado County (EDC) General Plan is discussed in detail in Section E3.1.11. The General Plan addresses wildlife and their habitats primarily within the Conservation and open space element, and to a lesser extent in the land use, circulation, and agriculture and forestry elements. These elements identify numerous goals, objectives, and policies for wildlife conservation with emphasis on protection and enhancement of wetlands and riparian communities, wildlife corridors, habitat diversity, threatened and endangered species, and deer winter, summer, and fawning habitat.

5.1.16 Sacramento County General Plan

The Sacramento County General Plan is discussed in detail in Section E3.1.12. The General Plan addresses wildlife and their habitats within the land use, open space, conservation, agricultural, and public facilities elements. These elements identify numerous wildlife conservation goals and objectives supported by various policies and implementation measures. The Plan emphasizes protection of riparian and wetland habitats, including marshes and vernal pools; protection of oak woodlands; conservation and management of special-status wildlife species and their habitats, and protection of designated Natural Preserves and wildlife movement corridors. Maps provided in the Plan indicate that the UARP transmission line does not encroach on any designated areas for these sensitive wildlife resources. Much of the land adjacent to the transmission line right-of-way is currently in residential development or under new residential and golf course construction.

5.1.17 Federal Power Act

The Federal Power Act, in particular sections 4(e), 10(j) and 18 of the act, are described in Section E1.1.4.

5.2 Overview

5.2.1 Historical Trends

Measuring populations and distributions of animals can be problematic because of their mobility, often-limited detectability, and annual variations in population size. Reliable conclusions on population trends over extended periods of time can be even more difficult to obtain. However, several publications have attempted to summarize the ecological history and trends in terrestrial wildlife populations of the Sierra Nevada: most notably the Sierra Nevada Ecosystem Project (SNEP) report (University of California 1996) and the compendium entitled [*Life on the Edge: A Guide to California's Endangered Natural Resources*] (BioSystems Analysis, Inc.1994).

Prior to 1820, the Sierra Nevada was populated by Native Americans who used fire, pruning, sowing, weeding, and selective harvesting to manage vegetation and wildlife (Beesley 1996; Anderson and Moratto 1996). Native American land use of the Sierra Nevada was displaced by the arrival of Spanish and Mexican European-Americans between 1820 and the 1850s. This immigration and settlement period marked significant changes in the native wildlife populations and wildlife habitat as a result of the introduction of mining, logging, domestic livestock grazing, fur trapping, market hunting, and fire suppression, among other man-caused impacts.

Hydraulic mining was particularly destructive to the Sierra Nevada watersheds with an estimated 680 million cubic yards of soil, sand, gravel and rock being washed into northern stream systems by 1880 (Kelly 1959). However, most mining activity in the SFAR watershed was placer mining rather than hydraulic mining.

Logging in the Sierra Nevada was originally related to the demand for lumber for building mining camps and Central Valley towns, along with use of wooden ties for railroad construction. No accurate totals exist for the amount of timber cut from Sierra Nevada forests, but claims from contemporary historical accounts range up to millions of board feet (Beesley 1984). A California State Forestry Board report published in 1886 estimated that 20 years of cutting and fire had "consumed and destroyed" one-third of the Sierra Nevada timber. Logging practices in the 1800s also led to an increase in catastrophic wildfires and substantial disturbance of forest soils due to dragging trees to chutes and loading pads. Milling operations degraded streams and riparian habitats by dumping large quantities of sawdust into rivers and floating logs to mills. These practices, especially clearcutting, have been detrimental to most forest landbird species because of the loss of large areas of habitat. In addition, the even-aged forests that tend to result from planting after clearcuts often lack the tree species diversity and structural diversity needed for large and diverse bird populations to persist (Graber 1996). Fragmentation due to logging has also been implicated in the loss of bird species diversity by increasing the ratio of forest edge to forest interior with resulting increases in the rate of nest parasitism by the brown-headed cowbird and nest predation by a variety of vertebrate species (Graber 1996).

Intensive grazing by domestic livestock in the Sierra Nevada, particularly in mid- to high-elevation meadows, caused tremendous impacts to native wildlife during the 1800s prior to regulation of this practice by the USFS. The number of sheep grazing on meadow systems in the Sierra Nevada during the 1800s has been estimated to be in the millions (Burcham 1957; Douglass and Bilbao 1975; Kinney 1996; Wagner 1989). This unregulated grazing has been implicated in the widespread reduction of many native perennial plant species and their replacement by more aggressive annual species (Beesley 1996). Grazing has also contributed to the decline of numerous landbird species, including willow flycatcher and great gray owls through loss of herbaceous growth and lowering of the water table in mountain meadows. Decline is also attributed to the attraction of brown-headed cowbirds, which parasitize the nests of may landbirds. The ENF LRMP (USDA 1988) indicates that the ENF authorized 24 grazing allotment permits in 1988 that covered approximately 111,000 acres and utilized 12,000 to 14,000 animal unit months (AUM) per year of available forage.

Fire suppression in the Sierra Nevada has led to forest and chaparral stand conditions unsuitable to many Sierran landbirds because of loss of microclimate elements. These conditions include: 1) a dense in-growth of shade-tolerant trees in place of forest openings containing herbs and shrubs and 2) decadent stands of chaparral with low productivity, instead of mosaics of various seral conditions (Graber 1996). The high-fuel loads associated with suppression often lead to large, stand-destroying fires that eliminate large, old trees, as well as snags, and logs that provide critical value to many species. The ENF has historically experienced an average of 88 fires per year, with over half of these being caused by humans. Large, extended burning-period fires occur every 7 to 14 years in the ENF. Recent large fires such as the Ice House, Pilliken, Chili Bar, Wrights, and Cleveland fires have caused major impacts on wildlife and their habitat.

Recreation has also had a profound effect on native wildlife in the Sierra Nevada. Recreational use of the Sierra Nevada increased rapidly with the advent of automobile access between 1900 and 1940. Improved access led to increased camping, hunting, hiking, and summer home

development. These activities threaten certain wildlife species that specialize in, or are limited to, areas that attract high levels of recreational use (Graber 1996). Montane meadows and riparian areas are most vulnerable because of their great popularity with campers, hikers, equestrians, and hunters. Some of the adverse effects on wildlife and their habitat that are linked to recreation use of the Sierra Nevada include: 1) direct mortality due to shooting and vehicle collisions; 2) habitat loss due to development and wildfire; and 3) changes in behavior of wildlife due to general human disturbance. The ENF is one of the most heavily recreated forests in the Sierra Nevada with over 800,000 recreation visitor use days estimated for the forest's Crystal Basin Recreation Area alone (see Section 8.2 of this document)

Without question, intense consumptive use of the Sierra Nevada by humans during the 1800s and early 1900s resulted in a substantial reduction in the numbers and diversity of native terrestrial wildlife. The early and mid 1900s saw the establishment of various state and federal agencies charged with protection and management of natural resources, including the USFS, United States Bureau of Reclamation (USBR), National Parks Service (NPS), and CDFG. Logging, mining, grazing, and fire suppression continued under management direction by these agencies, and the historical effects of these activities were compounded by expansion of recreation, urban development, introduction of non-native species, pesticide use, and widespread development of watersheds for irrigation, hydropower, and domestic water use (Beesley 1996; Connors 1992; Hundley 1992).

At the time of European settlement, large herds of tule elk and pronghorn were still present, especially in the interior valleys; mule deer dominated the foothills and mountain sheep occupied the crest and eastern slopes of the Sierra Nevada (Graber 1996). All four of these ungulates were hunted intensively by Spanish and other European settlers. This hunting greatly reduced populations, while domestic livestock overgrazed prime habitats. In addition, fur trapping during the 19th and 20th centuries for beaver, mink, river otter, red fox, American marten, Pacific fisher, and California wolverine greatly reduced populations of these species in the Sierra Nevada.

Three species that were widely distributed in the Sierra Nevada at the time of European settlement were extirpated during the 1900s: grizzly bear, California condor, and least Bell's vireo. Grizzly bears occurred over much of California at the time of Spanish settlement, but were concentrated in the open valleys and coastal plains. In the Sierra Nevada, they were reported most frequently in the foothill savannahs, woodlands, and chaparral, but they appear to have been distributed throughout the range (Graber 1996). Hunting was the primary factor in the loss of the grizzly bear with the last bear killed by a cattleman in the Sequoia National Forest in 1922.

The California condor likely began to decline long prior to European settlement in association with the disappearance of Pleistocene megafauna about 10,000 years ago. Condor populations persisted by scavenging on the large herds of tule elk, pronghorn, and other large mammals of the Holocene, and finally the cattle and sheep that followed European immigration. In more recent times, the decline of the California condor was accelerated through indiscriminate shooting, lead poisoning from shot consumed along with the abandoned carcasses of large mammals killed by hunters, egg collection, collisions with power lines, eggshell thinning from DDT, and an overall

loss of habitat. By 1982, only 22 condors remained in the wild, and their range was restricted to remote interior regions of southern California, with none in the Sierra Nevada (BioSystems Analysis, Inc. 1994). The last wild condor was captured in 1987 for use in a captive-breeding program in a desperate attempt to save the species. Condors are now being reintroduced in California, but it is uncertain whether historic habitat for the species in the Sierra Nevada provides sufficient quantity and quality to support self-sustaining populations.

The extirpation of the least Bell's vireo parallels the spread of brown-headed cowbirds, a brood parasite that has been implicated in the decline of many songbirds in the Sierra Nevada, including willow flycatcher, yellow warbler, warbling vireo, and song sparrow (DeSante 1995; Graber 1996). Cowbirds were first reported breeding in California in 1870, in the Sierra Nevada foothills in 1924, near Yosemite National Park in 1915, and near Mono Lake in 1916. The species is now widespread throughout the lower and middle elevations and its spread generally mirrors expansion of farming, grazing, clear-cut logging, pack stations, campgrounds, and suburban development in the Sierras (Airola 1986; Gaines 1977; Rothstein et al. 1980; Verner and Ritter 1983). However, the fundamental cause for the increase in cowbirds in the Sierra Nevada may be related to agricultural practices and feedlots in the major valleys both east and west of the range (Graber 1996). Cowbirds travel as far as about 4.5 miles from feeding areas to host nests (Rothstein et al. 1984, Airola 1986). Most passerine birds are susceptible to cowbird parasitism, but the species' effects can be highly local (Laymon 1987). Parasitism rates over 10 percent are generally cause for concern, and those in excess of 30 percent are considered to be a serious problem (Laymon 1995).

In addition to the brown-headed cowbird, a number of other non-native bird species have been introduced or become established, with varying effects on native wildlife. Non-native birds in the vicinity of the Project include ring-necked pheasant, wild turkey, rock dove, European starling, and house sparrow. Pheasant and wild turkey were intentionally introduced into California for sport hunting purposes. Pheasants occur in low numbers in low elevation grasslands and fields in the western portion of the Project near Folsom, while turkeys are increasingly common in the low- and mid-elevation portions of the Project. These upland game birds have minimal ecological effect on native species (Graber 1996). House sparrow, European starling, and rock dove spread into California from intentional introductions in the eastern United States and now occupy portions of the Sierra foothills in or adjacent to urban or agricultural lands (Graber 1996). They compete aggressively for nest sites with a number of native birds. Starlings, in particular, may have a significant effect on cavity-nesting species, such as western bluebird, ash-throated flycatcher, woodpeckers, and swallows (Small 1994).

Non-native mammals in the vicinity of the Project include Virginia opossum, beaver, house mouse, brown rat, black rat, muskrat, feral cat, wild pig, and feral goat. The Virginia opossum spread into the Sierra Nevada from an introduction in San Jose, and possibly elsewhere in California in the early 1900s. Opossum are generally found around urban and suburban developments, and although they prey on native wildlife, their overall impact on native species is probably minor. House mouse, brown rat, and black rat were introduced from Eurasia and are notorious pests in urban and some suburban areas including parts of the Sierra Nevada. Feral cats prey on small vertebrates and compete with small native carnivores adjacent to settlements.

Wild pigs are increasing in numbers and range in California, including the Sierra Nevada foothills (Graber 1996). They are the second most hunted big game species in California (Barrett 1977; Wood and Barrett 1978). Pigs compete with mule deer, black bears, band-tailed pigeons, squirrels, and many other native species for mast, mushrooms, and other food items.

The bullfrog, is originally native to the eastern United States, but now is widely distributed in ponds and slow-moving streams in the Sierra Nevada, and have been recorded at elevations as high as about 8,200 feet in the southern Sierra (Graber 1996). They are undoubtedly a significant factor in the precipitous decline of native ranid frog species such as the California red-legged frog, foothill yellow-legged frog, and mountain yellow-legged frog (Moyle 1973; Hayes and Jennings 1986). Bullfrogs are also known to prey on young western pond turtles, as well as ducklings and other aquatic and riparian vertebrates.

5.2.2 Current Status

A list of 348 terrestrial wildlife species known to occur, or with the potential to occur in the vicinity of the Project was compiled from several sources including the Wildlife Habitat Relationships System, California Natural Diversity Database (CNDDB), ENF LRMP, SNFPA, regional field guides, consultations with resource agency biologists, and the professional expertise of wildlife specialists (Table E5-1, in Appendix to Exhibit E, Section 5, located at the end of this section). This list includes one invertebrate, 23 reptiles, 241 birds, and 83 mammals. However, any list of wildlife species occurrence over broad areas should be interpreted with caution as differences in detectability among species, observer error, and inconsistent reporting of known records can result in errors of omission and commission. With one exception, no attempt was made to include all of the potential invertebrates that may occur in the Project area due to a general lack of information on invertebrate species distribution and habitat associations. The exception, the valley elderberry longhorn beetle, was included because of its status as a federally listed threatened species under the ESA, and the known occurrence of its host plant, *Sambucus mexicana*, within the vicinity of the Project. In addition, aquatic invertebrates and amphibians are excluded from Table E5-1, but are addressed in Section 3.0, Aquatic Resources.

Vegetation community descriptions for the Project region can be found in Section 4.0, Botanical Resources. The vegetation communities specific to each Project facility or feature are summarized in Section 4.3.

5.2.3 Special Status Wildlife Species

The term "special status" as used in this initial information package refers to species that are believed to be either imperiled (e.g., threatened, endangered, species of concern) or have a management designation (e.g., harvest species, management indicator species). The specific categories are as follows:

CE	Species listed as endangered under the California Endangered Species Act
CP	Reptiles designated as protected under CDFG sport fishing regulations, Title 14
CSC	California species of special concern; an administrative designation
CT	Species listed as threatened under the California Endangered Species Act

FE	Species listed as endangered under the Federal Endangered Species Act
FP	Species designated as fully protected under the California Fish and Game Code
FSC	Federal species of special concern (a term of art for former Category 2 Candidates)
FSS	USFS sensitive species
FSV	Sierra Nevada Framework species of moderate-high vulnerability and species of concern
FT	Species listed as threatened under the Federal Endangered Species Act
FTPD	Species listed as threatened under ESA but currently proposed for de-listing
HA	Commercially or recreationally harvested species
MIS	Forest Service designation for management indicator species
MNBMC	Bird species designated by the USFWS as a migratory bird of management concern
WBWG	Western Bat Working Group designation for high priority/imperiled bat species

The comprehensive list of 348 terrestrial wildlife species known or suspected to occur in the Project area (see Appendix E5-1) identifies 130 special status species including one invertebrate, three reptiles, 82 birds, and 44 mammals. Eleven of these species or subspecies (valley elderberry longhorn beetle, bald eagle, Swainson's hawk, peregrine falcon, greater sandhill crane, western yellow-billed cuckoo, great gray owl, willow flycatcher, bank swallow, Sierra Nevada red fox, and California wolverine) are federally and/or state-listed as endangered or threatened under the ESA and CESA. One species, the mountain plover, is proposed for federal listing as a threatened species. Over one-third (46) of these 130 species have multiple designations; 57 are designated solely as harvest species; 47 are considered federal and/or California species of special concern; and 37 species are designated by the USFS as sensitive, vulnerable, or management indicator species. Summaries of known information for each of the legally protected, "at risk" and management special status species are categorized by major taxon (i.e., invertebrates, reptiles, birds, mammals) and provided in the following narratives. Harvest species are discussed separately in Section E5.2.3.6.

5.2.3.1 Special Status Terrestrial Invertebrate

Valley Elderberry Longhorn Beetle (FT)

The valley elderberry longhorn beetle ranged historically throughout the Central Valley, extending up river canyons in the Sierra Nevada foothills to an elevation of about 3,000 feet. The beetle is completely dependent upon its host plant, elderberry (*Sambucus mexicana*) which is a common component of the remaining riparian forests and adjacent uplands. The beetles' use of elderberries is not readily apparent; often the only exterior evidence is an exit hole created by the larva just prior to pupation. The life cycle takes one or two years to complete with most of that time spent as larva living within the stems of the plant. Adults generally emerge from late March through June, and adults are short-lived.

The USFWS has issued conservation guidelines for the beetle, which include survey protocols and compensation requirements for elderberries with one or more stems measuring 1.0 inch or greater in diameter at ground level that may be directly or indirectly impacted by the construction or operation of a project. All elderberry plants with stems that meet the 1.0-inch-diameter threshold on, or adjacent to, a project site must be thoroughly searched for beetle exit holes and

the number of stems tallied by diameter size class for determination of compensation ratios. Elderberry plants lacking stems 1.0 inch or greater in diameter at ground level are considered unsuitable for use by the beetle and are not protected under the guidelines. Surveys are valid for a period of two years.

Elderberry plants are known to occur in the lower American River watershed. The Project surface facilities located below the assumed 3,000-foot elevational limit of the valley elderberry longhorn beetle are Jaybird Powerhouse, Camino Dam and Reservoir, Brush Creek Dam and Reservoir, Camino Penstock, Camino Powerhouse and Switchyard, Slab Creek Dam and Reservoir, Slab Creek Powerhouse, White Rock Penstock, White Rock Powerhouse, and the Project transmission line right-of-way from about Camino Powerhouse to Folsom Junction. Valley elderberry longhorn beetles may occur wherever elderberry plants exist in the vicinity of these facilities, especially in or adjacent to riparian areas. However, no records were found of the beetle within the Project area in a search of the CNDDB or during an extensive review of pertinent environmental documents for the area.

5.2.3.2 Special Status Reptiles

Western Pond Turtle (FSC, CSC, FSS, CP)
The western pond turtle is primarily an aquatic species and is addressed in Section 3.0, Aquatic Resources.

Coast Horned Lizard (FSC, CSC, CP)
The coast horned lizard once ranged throughout the lower elevations of the Sierra Nevada from Lake Shasta south (USDA 2001a). This species is now believed to have disappeared from over 35 percent of its former range in northern and central California. It occurs in several habitat types, from sun-exposed gravel and sand areas with scattered shrubs (especially dry lakebeds) to clearings in riparian woodlands and chaparral. Horned lizards are generally ground dwelling species that prefer open areas with undisturbed sandy soils. They are primarily diurnal and retreat at night into rodent burrows, under rocks, or simply burrow into loose soil. They eat a variety of small insects with harvester ants comprising the bulk of their diet. Following a winter brumation (i.e., hibernation in reptiles), horned lizards breed in the early spring (April and May) and lay up to 21 eggs shortly thereafter. Hatchlings emerge in August and September. The primary threats to the species are loss, fragmentation, and degradation of habitat from 1) urban development; 2) exotic Argentine ants that have replaced native ant species; 3) roads; 4) off-highway vehicle use; and 5) noxious weeds.

The available literature and resource databases have been reviewed to identify any reported occurrences of the horned lizard in the Project area. The CNDDB identifies one record of two horned lizards that were observed in May 1995 at Pine Hill (T. 10 N., R. 9 E., Sec. 16, SE) near the Project transmission line right-of-way. The observation was made southwest and just downhill from the summit. The species is presumed to remain extant at this location and may occur where suitable habitat exists throughout the Project area up to an elevation of about 5,000 feet, but especially in the lower foothills.

5.2.3.3 Special Status Birds

Common Loon (CSC, MNBMC)

The common loon is a rare fall and spring visitor to large, deep lakes in the Sierra Nevada such as Lake Tahoe (Zeiner et al. 1990). There are no recent breeding records for the Sierra Nevada south of Lassen County. Their diet includes about 80 percent fish, with crustaceans and aquatic plants also taken. Common loons require at least 60 feet of open water for their running take-off from the water surface. The primary concern for the species on inland lakes and reservoirs is disturbance of nesting pairs by motorboats.

The available literature and resource databases have been reviewed to identify any reported occurrences of the common loon on reservoirs in or adjacent to the Project. No nesting has been reported but participants in the annual Christmas Bird Count record wintering birds from the area each year. Most of these observations are believed to be from Folsom Lake near the westernmost portion of the Project transmission line.

American White Pelican (CSC - nesting colony)

The American white pelican breeds colonially on low, preferably bare, islands of large shallow fresh or brackish water lakes that are free from mammalian predators (USDA 2001a). In California, the white pelican now nests only at large lakes in the Klamath Basin, especially at Clear Lake National Wildlife Refuge (Airola 1980; Sloan 1982). Most of the breeding population leaves northeastern California from October to March. The species is uncommon to common on large lakes and estuaries in the Central Valley from August to December, and fairly common at Lake Tahoe and Salton Sea in late spring and summer. Migrant flocks pass overhead throughout much of California during almost any month, but mainly in spring and fall (Cogswell 1977; McCaskie et al. 1979; Garrett and Dunn 1981).

The white pelican feeds in water of various depths, diving for prey items from the surface and scooping them up in their pouch. In shallow water, small groups sometimes cooperate to drive fish closer to shore, where they are more easily caught. They prey almost entirely on fish, but occasionally on amphibians and crustaceans (Palmer 1962). During the breeding season, the white pelican may travel as much as 184 miles each way from breeding grounds to foraging areas (Lingle and Sloan 1980).

The available literature and resource databases have been reviewed to identify any reported occurrences of the American white pelican on reservoirs in or adjacent to the Project. No nesting has been reported but participants in the annual Christmas Bird Count record wintering birds from the Sacramento area in most years and USFS biologists indicate that the species occurs in the ENF. Pelicans may fly near the western portion of the Project transmission line during migration but are not known to use any aquatic habitats in the vicinity of the Project.

Double-Crested Cormorant (CSC - rookery sites)

The double-crested cormorant occurs sporadically in Sierra Nevada lakes and large rivers (Cogswell 1977). They require elevated sites (e.g., cliffs, snags, bridges, and utility poles) near water for colonial nesting and roosting sites. Breeding occurs from about early April to August,

with a peak in May and June. Cormorants feed on fish, some crustaceans, amphibians, aquatic insects, and plants that they obtain beneath the surface of the water (Cogswell 1977). They prefer to feed in water less than 30 feet deep with rocky or gravel bottoms, but have been noted to dive as deep as 70 feet. Cormorants also require a considerable length of water, or an elevated perch, for take-off.

Although designated as a California species of concern, populations of the double-crested cormorant have expanded tremendously in recent years due primarily to decreased levels of organochlorine contaminants and increased food availability (Federal Register 65(73):20194-20195). As a result, the USFWS published a notice of intent (64 FR 60826) in November 1999 to prepare an EIS and accompanying national management plan to address impacts caused by population and range expansion of the double-crested cormorant in the contiguous United States. This action is in response to increasing reports of resource conflicts between humans and cormorants. The North American breeding population has been estimated at about 372,000 pairs, or 852 colonies, and with a total population estimate of one to two million birds. In many parts of the United States, increased cormorant populations have led to conflicts with humans and various natural resources. Such conflicts include concerns over impacts to local economies, human health, the aquaculture industry, vegetation, fish populations, and bird populations.

The double-crested cormorant is observed regularly on reservoirs and large streams in the Project area. Most of these birds are utilizing the reservoirs for resting and foraging. Although suitable nesting substrates (e.g., snags, trees, utility poles) occur at or adjacent to Project facilities, no known records of any active rookeries have been found.

Harlequin Duck (FSC, CSC - nesting)

The Sierra Nevada range is believed to be at the very southern periphery of the harlequin duck's breeding range in North America, with most nesting concentrated in Alaska (USDA 2001a). Historic reports indicate that the species bred on the principal streams of Calaveras and Tuolumne counties, from elevations of about 4,000 feet and higher, and on nearly every watershed in Yosemite National Park. Zeiner et al. (1990) state that the breeding range was from Madera to Tuolumne County. Observations over the past 20 years from the western Sierra Nevada are sporadic and mostly anecdotal. However, an increase in sightings in recent years suggests that the species may be staging a comeback in Yosemite Valley. Recent records for Yosemite include: pairs summering almost annually since 1978 on the South Fork Merced River, and a pair observed several times in Yosemite Valley in April 2000. Harlequin ducks have also been observed several times during the 1990s on the NFAR, Silver Fork of the SFAR, Rubicon River, and the North Fork of the Feather River (USDA 2001a).

The harlequin duck requires fast-flowing turbulent streams for breeding. Nests are usually placed within a recess, sheltered overhead by a stream bank, rocks, woody debris, or low shrubs (Zeiner et al. 1990). Zeiner et al. (1990) state that there is no evidence of nesting in tree cavities, however, Robertson and Goudie (1999) cite documentation of two nests within tree cavities in Idaho. Nests are usually on islands in rivers or on streambanks, but may be up to about 65 feet away from the water edge. Pairs bond during winter and early spring and nesting occurs from May through August. The clutch size is typically three to seven eggs and only the female tends

to the precocial young. Broods are usually led to a quiet portion of the stream, preferably with hiding places under overhanging vegetation, and remain there until half-grown. Harlequin ducks feed primarily on animal foods, including crustaceans, mollusks, and on breeding grounds, aquatic insects. They feed most actively during early morning and evening hours.

Factors that have been implicated in the decline of the harlequin duck in the Sierra Nevada include rafting operations, dams, and general human disturbance from anglers. However, it is uncertain why observations of harlequins have increased in recent years in spite of the fact that the number of dams has remained essentially constant and recreational use along streams has increased substantially.

As indicated above, harlequin ducks have been reported from the upper Rubicon River in the vicinity of Project and the species may be occur seasonally on other Project streams above Union Valley Reservoir.

Barrow's Goldeneye (HA, CSC - nesting)

The Barrow's goldeneye bred historically (prior to 1940) on mountain lakes and larger streams of the Sierra Nevada south to Yosemite National Park (Cogswell 1977; USDA 2001a). They are now either extremely rare visitors to the Sierra Nevada, occurring mostly in the fall, or may be extirpated entirely as a breeding bird in the Sierras (McCaskie et al. 1979). However, a female with a brood was reported in 1988 on Mahogany Lake in the Lassen National Forest, the last documented record of breeding by the species in the state, and apparently the only record since 1934 (USDA 2001a). The apparent extirpation of the breeding population may be related to disturbance from fishing, boating, and shooting, and possibly the removal of large snags that provided nesting cavities.

Suitable nesting habitat consists of relatively shallow lakes and ponds with extensive beds of submerged vegetation and wooded shorelines. Water bodies greater than 2 acres in size are generally preferred. Nesting usually occurs in snags with cavities, but nest boxes, rock crevices, and burrows have also been used. Nests are usually within 100 feet of water. These ducks feed on mollusks, crustaceans, insects, small fish, and submerged seeds that they capture underwater. A negative correlation has been suggested between occurrence of fish in a lake and use by goldeneyes, presumably because fish reduce the abundance of invertebrate prey. As a result, fish stocking in the Sierra Nevada may have an adverse impact on habitat suitability for Barrow's goldeneye (USDA 2001a).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the Barrow's goldeneye in the Project area. No such occurrences were identified through this effort. Although wintering birds may occur rarely in lower elevation streams near the Project, most experts consider the species to be extirpated as a breeding species in the Sierra Nevada.

Osprey (CSC - nesting)

The osprey is one species that has benefited greatly from reservoir development in North America. Impoundments have allowed ospreys to expand both their range and numbers

(Swenson 1981; Poole 1989). Twenty percent of California's osprey were known to nest near reservoirs in the late 1980s (Poole 1989) and that number has almost certainly increased. The species breeds from March to September with a peak in May and July. The nest is usually constructed as a platform of sticks at the top of a broken-top tree, snag, or man-made structure near water. They feed primarily on fish but have been known to take small mammals, birds, reptiles, amphibians, and invertebrates. Early declines were attributed mostly to widespread pesticide contamination. However, the species has recovered dramatically since a ban on the use of DDT. Ospreys are relatively tolerant of human activity and nest sites are often chosen in urbanized locations (Poole 1989).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the osprey in the Project area. USFS biologists are aware of several osprey nesting within the ENF in the vicinity of Project reservoirs and streams (pers. comm., Don Yasuda, USFS Pacific Ranger District biologist, March 2001). Site-specific information on the location of these nests was not available at the time this IIP was prepared.

White-Tailed Kite (FP, MNBMC - nesting).

The white-tailed kite is common to uncommon and are yearlong residents in Sierra Nevada foothills and adjacent valley lowlands within California. The species has increased in number and extended its range in recent decades.

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

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the white-tailed kite in the Project area. The CNDDB has several records for eastern Sacramento County near Folsom and suitable habitat occurs at lower foothill elevations along most of the Project transmission line right-of-way. Kites are known to occur year-round in this area and at least one pair of white-tailed kites nested in a stand of large oaks at the Folsom Junction terminous of the Project transmission line in 1999 and 2000 (pers. observation, R. Williams, DE&S biologist, various dates).

Bald Eagle (FTPD, CE, FP, MIS - nesting and wintering)

The bald eagle was listed by the USFWS as a federal endangered species in 1978, primarily due to population declines related to habitat loss, combined with contamination of prey species by past use of organochlorine pesticides, such as DDT and dieldrin (USDA 2001a). On August 11, 1995 the bald eagle was downgraded to threatened status in all lower 48 states. Since then, all of

the recovery goals set forth in the Recovery Plan for the Bald Eagle Pacific Region have been met and the USFWS has proposed to delist the species and remove protections afforded by the ESA (FR Vol. 64(128):36454). However, several factors still pose risks to the species, including disturbance of nest sites by recreationists, fluctuating fish prey populations, and number of roost trees available as a result of reservoir level fluctuations, wildfire, and habitat fragmentation.

The bald eagle breeds or winters throughout California, except for the desert areas. Most breeding in the state occurs in the northern Sierra Nevada, Cascades, and north coast range. California's breeding population is resident year-round in most areas, where the climate is relatively mild (Jurek 1988). Between mid-October and December, migratory birds from areas north and northeast of California arrive in the state. Wintering populations remain through March or early April. Based on annual wintering and breeding bird surveys, it is estimated that between 100 and 300 eagles winter on Sierra Nevada National Forests, and at least 151 to 180 pairs remain year-round to breed (USDA 2001a). Breeding generally occurs from February to July, but can be initiated as early as January via courtship, pair bonding, and territory establishment. The breeding season normally ends around August 31, as the fledglings are no longer attached to their nest area.

The bald eagle typically nests in large, old-growth or dominant live trees with open branching, and within two miles of a lake, reservoir, or river containing fish. Most nesting territories in California are located in elevations ranging 1,000 to 6,000 feet, but nesting can occur from near sea level to over 7,000 feet (Jurek 1988). Nest trees typically provide an unobstructed view of the associated water body and are often prominently located on the topography. The bald eagle often constructs up to five nests within a territory and alternate between them from year to year.

The bald eagle is a generalized and opportunistic scavenger and predator. The most common prey taken are fish, waterfowl, rabbits, and carrion of various animals. In general, foraging habitat consists of large bodies of water or free-flowing rivers with abundant fish and adjacent snags and other perches (USDA 2001a).

Wintering habitat is associated with open bodies of water, primarily large lakes and reservoirs. Two characteristics that play a significant role in habitat selection during the winter are diurnal feeding perches and communal night roost areas. Most communal roosts are usually located near an abundant food source and have greater protection from the weather than diurnal habitat.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the bald eagle or significant eagle habitat in the Project area. The CNDDB and the ENF (ENF 2001; pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001) report that bald eagles winter annually on the ENF and have had one nesting pair at Union Valley Reservoir each year since 1986. The first known nest site at the reservoir was located in the Wench Creek Campground (T. 12N., R. 14E. section 14 in 1988). The Wench Creek nest fledged young successfully in 1986 and 1987, and the nest was used but unsuccessful in 1988, 1990, and 1991. The Wench Creek nest tree was removed for safety concerns in 1995. A second nest site, named the West Point nest, was discovered near Union Valley Dam (T. 12N. R. 14E., Section 29) in 1989. ENF

biologists believe that the eagles began constructing the West Point nest in 1988, and the pair appeared to be feeding young in 1989, but the nest failed that year following a late-spring snowstorm. The Cleveland Fire destroyed the West Point nest in 1992. A third nest was discovered in 1992 on Granlees Point (T. 12N., R. 14E, Section 23), and this site fledged young successfully in 1992, 1993, 1994, 1997 and 2000. The Granlees Point nest was unsuccessful in 1995, 1996, 1998, 1999 and 2001.

The primary threat to the nesting pair at Union Valley Reservoir is high recreation use of the area. The ENF has developed a Bald Eagle Management Plan for this pair that addresses the requirements of the ESA and ENF LRMP (ENF 2000). As part of the Management Plan, the ENF has established seasonal and spatial closure zones around the Granlees Point nest site and staff biologists monitor the nesting eagles on an annual basis (ENF 1997, 2000). This nesting territory is protected from human disturbance during the critical nesting period from January 1 through August 15 (or until the young have fledged or the nest is abandoned). Public entry into this zone is prohibited during this period. Closure notices are posted along the boundary of this zone and information is posted at campgrounds and boat launches around Union Valley Reservoir, as well as at the ENF Information Center and the Crystal Basin Information Center. In previous years, the closure area consisted of the shoreline adjacent to the nest area, as well as the nest stand, but did not restrict use of the cove adjacent to the nest stand. This cove receives a great deal of boat traffic and contributes to people using the restricted shoreline area. According to the Management Plan, buoys were to be installed near the entrance to this cove in the fall of 1998 to restrict boat access during the closure period, and to initiate a 5-mph zone in the cove the remainder of the year.

No other nest sites currently exist within the Project area or anywhere else on the ENF. However, the forest has mapped suitable nesting, summer, and winter bald eagle habitat at various sites in ENF, including around Project features (see Appendix E5-2):

Loon Lake Reservoir:	Summer habitat along southeast shore
Gerle Creek Reservoir:	Summer habitat around entire shoreline
Ice House Reservoir:	Summer/winter habitat along northwest shore and southeast shore
SFAR:	Winter habitat from about Kyburz to west boundary of ENF
Union Valley Reservoir:	Nesting/wintering habitat at northeast and southeast shores; Summer/winter habitat around entire reservoir

The ENF has delineated additional summer habitat at Wrights Lake just east of the Project. Also, the CNDDB reports that eagles have wintered at Bass Lake in western El Dorado County (T. 10 N., R. 9 E., S. 31, NE Qtr; elevation 1,250 ft) for over 40 years. Bass Lake is about 1.5 miles south of the Project transmission line. Residential development has been identified as a major concern to wintering eagles at Bass Lake.

Northern Harrier (CSC - nesting)

The northern harrier ranges throughout the Central Valley and Sierra Nevada of California. It frequents meadows, grasslands, open rangelands, desert sinks, wetlands, and other open habitats, but is seldom found in wooded areas (Zeiner et al. 1990). It breeds from sea level up to about

5,700 feet in the Sierra Nevada and ranges up to as high as 10,000 feet. The California population has apparently decreased in recent decades (Remsen 1978), but can be locally abundant where suitable habitat remains free of disturbance, especially from intensive agriculture. The primary reasons for the decline are destruction of wetland habitat, native grassland, and moist meadows, and burning and plowing of nesting areas during early stages of the breeding cycle (Remsen 1978).

The northern harrier feeds mostly on voles and other small mammals, birds, frogs, small reptiles, crustaceans, insects, and, rarely, on fish. They nest on ground in emergent wetlands, grasslands with shrubby vegetation, grain fields, or on sagebrush flats, sometimes several miles from water. The nesting season extends from April to September, with peak activity from June through July. The clutch averages five eggs, with a range of three to 12. The female incubates while the male provides food. The nestling period lasts about 53 days and the breeding pair and juveniles may roost communally in late autumn and winter.

The available literature and resource databases were reviewed to identify any reported occurrences of the northern harrier in the Project area. No occurrences were identified through this effort. However, suitable habitat occurs at lower foothill elevations along the Project transmission line right-of-way and the species is known to occur year-round.

Sharp-Shinned Hawk (CSC - nesting)

The current distribution of the sharp-shinned hawk in California is poorly understood. It is a fairly common migrant and winter resident throughout California, except in areas with deep snow (Zeiner et al. 1990). The species breeds primarily in mid- to lower-elevation conifer forests and oak and riparian woodlands, but there are relatively few breeding records for the Sierra Nevada. It generally nests in single-tiered dense pole and small-tree stands and feeds in open stands. The proximity of water is believed to be an important habitat parameter in nest site selection. Breeding occurs from April to August, with the peak from late May to July. The clutch size averages four to five eggs with a range of three to eight. Incubation lasts 34 to 35 days and is performed by both parents. Fledging generally occurs at about 60 days. Fledging is timed to coincide with fledging of prey birds, providing a food supply for young, inexperienced hunters (Zeiner et al. 1990).

This accipiter preys mostly on small birds and some mammals and insects. North-facing slopes with plucking perches are critical requirements. Declines in the population have been attributed to pesticide contamination and habitat loss and degradation, especially due to development in foothill habitat.

The available literature and resource databases were reviewed to identify any reported occurrences of the sharp-shinned hawk in the vicinity of the Project. No records were discovered during this search. However, suitable habitat exists throughout most of the Project area and the species is expected to occur year-round.

Cooper's Hawk (CSC - nesting)

The Cooper's hawk ranges throughout most of California from sea level to above 9,000 feet (Zeiner et al. 1990). It breeds in woodland habitat, from near sea level up through the red fir and lodgepole pine zones. The Cooper's hawk nests most often in foothill oak-woodland and riparian woodlands, and typically near water. Breeding occurs from late March to August with a peak from May to July. Nests are usually constructed in a crotch of a deciduous tree, but occasionally also in conifers. The clutch averages four to five eggs and the female incubates for 35 to 65 days, while the male provides food.

The Cooper's hawk preys primarily on small birds captured in edge habitat, but will also take small mammals, and occasionally reptiles and amphibians. Snags are often used for resting and prey plucking. The causes for the decline of this species are uncertain; however, pesticide contamination and habitat loss and degradation, especially due to development in foothill habitat, may be a factor in the Sierra Nevada.

The available literature and resource databases were reviewed to identify any reported occurrences of the Cooper's hawk in the vicinity of the Project. No nesting records were obtained from this search. However, suitable habitat exists throughout most forested habitats in the Project area and the species is known to occur year-round.

Northern Goshawk (FSC, FSS, CSC, MIS - nesting)

On the west slope of the Sierra Nevada, the northern goshawk breeds from about 2,500 feet in elevation in the ponderosa pine/mixed-conifer vegetation types up to approximately 10,000 feet in the red fir and lodgepole pine types (USDA 2001a). They are generally year-round residents in suitable habitat but some limited seasonal altitudinal movements may occur. Nests are generally constructed in live conifer or hardwood trees, but also occasionally in snags. Nest trees are also usually among the largest trees in a stand exhibiting greater canopy cover, greater basal area, greater numbers of large diameter trees, lower understory cover, and more moderate slopes relative to non-used stands.

The northern goshawk nesting period extends from mid-February through mid-September, with egg laying occurring between mid-April and mid-May (USDA 2001a). The incubation period is approximately 32 to 34 days. The nestling period is approximately 42 to 45 days and, once fledged, juveniles remain in the nest area for a period of four to eight weeks before dispersing. Annual variation in reproduction is affected by weather and prey dynamics, and not all pairs of goshawks reproduce each year.

The goshawk preys mainly on small mammals (e.g., tree and ground squirrels, rabbits) and birds (e.g., Steller's jay, northern flicker, American robin) on or near the ground. Foraging typically occurs in forest with dense to moderately open overstories, open understories interspersed with meadows, brush patches, riparian areas, or other openings (USDA 2001a).

There is concern that the northern goshawk population and reproduction levels may be declining in North America and California due to changes in the amount, distribution, and degradation of habitat, primarily from timber harvest (USDA 2001a). As a result, the goshawk is a "focus

species" of the Sierra Nevada framework. However, no data exists to estimate the historic abundance or density of northern goshawks in the Sierra Nevada. Currently, over 500 occupied nest territories are known to occur on national forest lands of the Sierra Nevada.

Three factors have the greatest potential to negatively affect breeding goshawks: 1) vegetation treatments; 2) recreation; and 3) falconry harvest (USDA 2001a). Recreational effects are most acute where active nests are located along trails and other areas that receive heavy foot traffic. Goshawks initiate breeding when the ground is still covered with snow and nests are sometimes directly located along roads and trails that provide flight access. Such sites become prime candidates for disturbance following snowmelt as recreationists begin to use these roads and trails.

The USFS has been directed by the Forest Plan Amendment (USDA 2001a) to establish 200-acre protected activity centers (PACs) around all known and newly discovered breeding territories detected on national forest lands. PACs are intended to contain the best available nesting habitat in the largest contiguous blocks possible, based on aerial photography. In patchy habitats, PACs are to consist of multiple patches greater than 30 acres within one-half mile of the nest site. Best available forest stands for PACs on the westside of the Sierra Nevada have the following characteristics: 1) trees in the dominant and co-dominant crown classes average 24 inches diameter at breast height or greater and 2) stands have at least 70 percent tree canopy cover. Non-forest vegetation types (e.g., brush and meadows) are not counted as part of the 200 acres.

The USFS is directed to maintain PACs regardless of occupancy status, unless the habitat is rendered unsuitable by a catastrophic stand-replacing event (e.g., fire) and surveys confirm non-occupancy (USDA 2001a). Fuel treatment and vegetation management activities are limited within PACs. In addition, limited operating periods (LOP) prohibit activities within approximately one-quarter mile of a nest site during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting. If the location of a nest stand within a PAC is unknown, surveys can be conducted to determine the stand location or the LOP can be applied to a one-quarter mile area surrounding the PAC. LOPs do not apply to existing road and trail use and maintenance or continuing recreation use, except where analysis of a proposed project or activity indicates that disturbance to a nest is likely to result. The LOP may also be waived for individual projects or activities of limited scope and duration, or when a biological evaluation documents that such projects are unlikely to result in breeding disturbance. Where a biological evaluation determines that a nest site will be shielded from planned activities by topographic features that minimize disturbance, the LOP buffer distance may be reduced. PACs may be removed from consideration if surveys determine they are unoccupied for two years.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the northern goshawk in the vicinity of the Project. ENF biologists have documented numerous detections of goshawk from within the ENF boundaries. Numerous PACs have also been delineated including several adjacent to Project features (see Appendix E5-2).

Table E5.2-1. Northern Goshawk PACs in the vicinity of Project features.	
Project Feature	**Approximate Location of Protected Activity Center**
Loon Lake Reservoir	About 1 mile north of upper reservoir on the Ellis Creek tributary
Gerle Creek	Along Gerle Creek about 0.5 mile north of Gerle Creek Reservoir
Gerle Creek Reservoir	About 1 mile east of reservoir between Angel Creek and Rubicon River
Union Valley Reservoir	Adjacent to northwest shore of reservoir; About 0.5 mile east of reservoir and just north of Big Silver Creek; Several scattered around headwaters of Silver Creek above U.V. reservoir
Silver Creek, Jay Bird Creek, Brush Creek, Slab Creek	Several scattered along these streams in vicinity of project reservoirs

Swainson's Hawk (CT - nesting)

The Swainson's hawk was once the most common bird of prey in the low grasslands of California, with populations during the 1900's as large as 17,000 pairs. By the early 1980s, only 550 nesting pairs were found in California and numbers have been slowly declining, although populations appear stable in other parts of the U.S. Today, most nesting in California is confined to the Central Valley and parts of the Great Basin, although some birds may wander into the Sierra Nevada foothills adjacent to the Central Valley. About two-thirds of the statewide population nest in the southern Sacramento Valley and northern San Joaquin Valley regions.

The Swainson's hawk arrives at its breeding areas in California from early March to early April, the female lays two to four eggs by mid-May. The female will remain in the nest incubating for 25 to 28 days while the male hunts for both of them. After the chicks hatch, both parents share the tasks of tending the young and defending the nest. In early July, several weeks after the young birds have learned to fly, the hawks begin to roost and hunt in flocks. By early September, they begin to migrate south in flocks sometimes as large as hundreds of birds. Their wintering grounds are as far south as Argentina, making their migrations one of the longest of any of the North American hawks, averaging 11,000 to 17,000 miles round-trip.

Breeding birds require large, open grasslands with abundant prey in association with suitable nest trees such as oaks, cottonwoods, walnuts, and willows in the Central Valley. Suitable hunting grounds include native grasslands or lightly grazed pastures, alfalfa and other hay crops and certain grain and row croplands. Croplands in which prey is scarce or difficult to get at because of the density of vegetative cover (e.g., vineyards, orchards, rice, corn, and cotton) are unsuitable hunting grounds for the species. Swainson's hawks prey most often on small mammals such as mice, gophers, ground squirrels, rabbits, and most commonly, voles. They will also feed on other birds, bats, and insects that it captures while in flight.

The primary causes of the decline in the California Swainson's hawk's population are believed to be: 1) loss of nesting and foraging habitat on the species' breeding grounds; and 2) pesticide poisoning on the species' winter range in Argentina. Much of California's native grassland that was formerly occupied by the species has been converted to crop fields and pastures. This has lead to a decrease in prey, loss of nesting sites, loss of hunting habitat, and exposure to harmful chemicals used for agricultural purposes, such as pesticides. Urbanization has also contributed to the loss of nesting and hunting habitat. In the Sacramento Valley, more than 95 percent of the

original riparian habitat has been destroyed. The small areas of good habitat that remain are threatened by development. In addition, Swainson's hawks incurred massive mortality on the species' Argentine winter range where biologists estimated as many as 20,000 birds died during the winters of 1994-1995 and 1995-1996 because of poisoning from the pesticide monocrotophos (MCP) used locally on alfalfa and other crops where these hawks often forage. A reduction on the use of MCP in Argentina since this discovery is believed to have substantially lowered the Swainson's hawk mortality rate on its winter range.

The available literature and resource databases were reviewed to identify any reported occurrences of the Swainson's hawk in the vicinity of the Project. No nesting records were obtained from this search and the species is unlikely to occur in the Project area. However, marginal foraging and nesting habitat currently exists along the extreme western end of the Project transmission line right-of-way near Folsom Junction. However, open grassland habitats in this area are rapidly being converted to residential and commercial properties.

Ferruginous Hawk (FSC, CSC, MNBMC - wintering)
The ferruginous hawk is an uncommon winter resident and migrant at lower elevations and open grasslands in the Modoc Plateau, Central Valley, and Coast Ranges of California (Zeiner et al. 1990). They frequent open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys, and fringes of pinyon-juniper habitats.

The ferruginous hawk eats mostly lagomorphs, ground squirrels, and mice, but will also take birds, reptiles, and amphibians. Population trends may follow lagomorph pika population cycles. They generally roost in open areas, usually in a lone tree or on a utility pole. There are no breeding records from California.

The available literature and resource databases were reviewed to identify any reported occurrences of the ferruginous hawks in the vicinity of the Project. No records were obtained from this search. However, suitable wintering habitat exists in open portions of the Project, especially along the extreme western segment of the Project transmission line. Wintering birds may occur in very low numbers on an irregular basis in this area.

Golden Eagle (CSC, FP - nesting and wintering)
The golden eagle occurs throughout the Sierra Nevada and foothills adjacent to the Central Valley, primarily in sparse woodlands, grasslands, savannas, lower successional forest stages, and shrubland. Cliffs, large trees, and man-made structures (e.g., electric transmission towers) with a commanding view are used for nesting. Breeding occurs from January to September with a peak in March through July. The clutch ranges from one to three eggs, with two eggs being typical. Eggs are laid in early February to mid-May. The incubation period lasts 43 to 45 days and the nestling period is 65 to 70 days. Prey includes small and large mammals, birds, reptiles, fish, and some carrion.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the golden eagle in the vicinity of the Project. No such records were identified through this effort, although suitable

habitat for the species exists throughout the Project and golden eagles are believed to be relatively common.

Merlin (CSC - wintering)
The merlin is a rare to uncommon winter resident and migrant from September to May in the Sierra Nevada, generally below 3,900 feet (Zeiner et al. 1990). The species frequents shorelines, open grassland, savanna, sparse woodland, lakes, wetlands, habitat edges, and early successional stages. When present, merlins are generally found in open country and along the shores of lakes and marshes where they often prey mainly on shorebirds and other small birds, but will also take small mammals and insects. The merlin does not breed in California.

The available literature and resource databases have been reviewed to identify any reported occurrences of the merlin in the vicinity of the Project. No such occurrences were identified through this effort. However, suitable wintering habitat exists in open portions of the Project, especially along the extreme western segment of the Project transmission line. Wintering birds may occur in very low numbers on an irregular basis in this area.

American Peregrine Falcon (CE, FP, MNBMC, MIS - nesting)
The peregrine falcon has made a dramatic recovery across its range since the ban on the use of the organochlorine DDT. As a result, the USFWS removed the subspecies (i.e., de-listed) from the federal list of threatened and endangered species on August 25, 1999 (Federal Register 1999). The species remains listed as endangered under the CESA.

The peregrine is typically an open-country bird in all seasons. Their occurrence in an area is strongly influenced by the availability of suitable avian prey. Most peregrines nest on cliffs or cliff-surrogates (e.g., buildings, bridges) near water. Nest territory size fluctuates with prey availability. Nesting usually occurs from early March to late August. The clutch size is three to seven eggs and incubation spans about 32 days.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of nesting peregrine falcons in the vicinity of the Project. The nearest known nest site is located at Salt Springs Reservoir about 22 miles southeast of Ice House Reservoir. Several formal surveys for peregrines and suitable nesting habitat have been conducted in the ENF since 1980. Boyce and White (1980) surveyed 13 cliffs within the ENF and determined that only five of these had potential to support nesting peregrines. Of these potential sites, the Salt Springs site is the only one that has been occupied by peregrines to date. Aulman (1993, 1994) surveyed seven sites within the ENF including cliffs near Union Valley Reservoir and along the Rubicon River but no nesting activity was found. Based on this information, peregrine falcons are not likely to nest in the vicinity of the Project, although marginal cliff habitat exists. Wintering birds and migrants can be expected to occur throughout the Project on a regular basis.

Prairie Falcon (CSC - nesting)
The prairie falcon is an uncommon permanent resident and migrant in the Sierra Nevada (Zeiner et al. 1990). It occurs most commonly in open habitats such as annual grasslands, savannahs,

rangeland, some agricultural areas, and desert scrub. The prairie falcon typically nests on cliffs with ledges and hunt from elevated perches such as snags, power poles, and cliffs. Breeding occurs from about mid-February through August, with a peak from May through July. The clutch averages five eggs with a range of three to six eggs. Egg laying typically occurs in early April. The prairie falcon preys mostly on small mammals, but will also take small birds, insects, and reptiles.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of nesting prairie falcons in the vicinity of the Project. No such records were identified through this effort. Surveys of potential cliff habitat in the ENF have been conducted on several occasions since 1980 (see Peregrine Falcon). Although these surveys did not target prairie falcons specifically, the species would have been recorded if present. Based on this information, prairie falcons are not likely to nest in the vicinity of the Project, although marginal cliff nesting habitat exists. Wintering birds and migrants can be expected to occur throughout the Project on a regular basis.

Mountain Quail (MIS, HA)

The mountain quail is a common to uncommon resident of most montane habitats of the state (Zeiner et al. 1990). They are found seasonally in open, brushy stands of conifer and deciduous forest, and occasionally in woodland and chaparral. Areas with steep slopes are preferred. They are also a hunted species in California, with over 122,000 birds estimated taken throughout the state in 1999.

The mountain quail feeds mainly on green foliage, buds, acorns, flowers, and the fruits and seeds of forbs, shrubs, and trees. They can meet water needs from food and dew in cool weather, but require drinking water in dry weather. As a result, birds may gather at water sources in summer, and broods are seldom found more than one-half mile from water. The mountain quail is altitudinal migrant and will move up to 20 miles upslope and downslope within their range. It usually breeds at higher elevations and move downslope for winter following the snowline.

The mountain quail typically breeds from late March to late August, with a peak from May through July. It nests on the ground, and generally in herbage at the base of a tree, shrub, or log. The clutch size averages 10 eggs, and the female incubates for about 25 days, while the male remains nearby. Both parents tend the precocial young and the brood may remain together throughout the winter.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of mountain quail in the vicinity of the Project. No such records were identified through this effort. However, the species is considered to be common in suitable habitat throughout the Project area.

Greater Sandhill Crane (CT, FP, FSS)

Two subspecies of sandhill crane occur in California, the greater (*Grus canadensis tabida*) and lesser (*G. c. canadensis*). Historically, the greater sandhill crane was a fairly common breeder on California's northeastern plateau (Grinnell and Miller 1944). The subspecies is now reduced

greatly in numbers due to hunting, agricultural expansion, drainage of wetlands, cattle grazing, and human disturbance, especially within one mile of an active nest (USDA 2001a). In the Sierra Nevada, the greater sandhill crane now occurs only on the Modoc, Lassen, Plumas, and Tahoe National Forests during the summer breeding season and during migration.

Nesting typically occurs in remote portions of extensive wetlands (Cogswell 1977). On dry sites, nests are scooped-out depressions lined with grasses. More commonly, nests are large mounds of wetland plants in shallow water. Natural hummocks or muskrat houses are often used. Ideal sites are on small islands screened by tall tules, cattails, or shrubs (Harrison 1978). The breeding season begins with an elaborate courtship dance behavior in April, and nesting is usually completed by late August. Cranes are monogamous and may remain paired for life (Johnsgard 1975). They are solitary nesters with an average clutch size of two eggs. Incubation is about 30 days and chicks fly at about 79 days, but remain with the parents for up to a year.

In summer, the greater sandhill crane occurs in and near wet meadow, shallow lacustrine, and fresh emergent wetland habitats. It winters primarily in the Sacramento and San Joaquin valleys from Tehama County south to Kings County (Grinnell and Miller 1944), where it frequents annual and perennial grassland habitats, moist croplands with rice or corn stubble, and open, emergent wetlands. They feed on grasses, forbs, cereal crops, fruits, berries, invertebrates, and small vertebrates.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of nesting greater sandhill cranes in the vicinity of the Project. No such records were identified through this effort. The subspecies has not been reported to occur on the ENF (USDA 2001a) but birds may occasionally cross over Project transmission lines during migration between their breeding and wintering grounds.

Mountain Plover (FPT, CSC, MNBMC)

The mountain plover was formally proposed for federal listing as threatened in 1999 (Federal Register Volume 64, Number 30:7587-7601) and its status is currently under review. This bird breeds in the Rocky Mountain states from Canada south to Mexico with most breeding birds occurring in Montana and Colorado. Most wintering birds occur on grasslands and cultivated fields in California. Breeding Bird Survey results from 1966 through 1996 document a continuous decline of 2.7 percent annually for this species, the highest rate of all endemic grassland species. Between 1966 and 1991, the continental population of the mountain plover declined an estimated 63 percent. As of 1999, the population was estimated at 8,000 to 10,000 birds. Conversion of grassland habitat, agricultural practices, livestock management, and decline of native herbivores are the primary factors implicated in the decline.

In California, the mountain plover is a rare winter resident (September through March) in short grasslands and plowed fields of the Central Valley from Sutter and Yuba counties southward. It is also found in foothill valleys below about 3,200 feet elevation, primarily west of the San Joaquin Valley, and in the Imperial Valley. Most Central Valley birds occur south of Sacramento and west of US Highway 99. The mountain plover is gregarious on their wintering habitat with

flocks of 20 to 180 individuals that increase in size as spring migration approaches. Flocks of up to 1,100 birds have been reported from the San Joaquin Valley and Imperial Valley. In general, the mountain plover spends about four months on breeding grounds, five months on wintering habitat, and the remaining time mostly in their fall migration.

The available literature and resource databases have been reviewed to identify any reported occurrences of the mountain plover in the vicinity of the Project. No such records were identified through this effort. The mountain plover does not nest in the Project area but may occur rarely during winter in grasslands and fields along the westernmost portion of the Project transmission line.

Long-billed Curlew (CSC, MNBMC)

The long-billed curlew is a migratory bird species that breeds in open valleys and flatlands of the western United States (USDA 2001a). The species was formerly more abundant, but hunting, agricultural practices, and livestock grazing (particularly during the nesting season) have caused curlews to decline in abundance in the western United States and to disappear entirely in the eastern United States. Most population declines in the western United States are local and not widespread. North American Breeding Bird Survey (BBS) trend results for the period 1966 through 1999 show a 79.4 percent annual increase in curlew populations in California, a 1.7 percent annual increase in the western survey region, and a 1.5 percent decrease in the United States. Trends for the period 1980 through 1999 are 13.2, 0.2, and -1.7 percent for California, the western BBS region, and the United States, respectively (USDA 2001a).

The long-billed curlew nests on the ground, usually in a flat area with short grass, and is generally a solitary nester, but may be found in loose colonies in suitable habitat. In California, nesting habitat includes wet meadows, upland shortgrass prairies, and elevated interior grasslands, usually adjacent to lakes or marshes (Grinnell and Miller 1944; Zeiner et al. 1990). It is an uncommon to fairly common breeder from April to September in northeastern California in Modoc, Siskiyou, and Lassen counties, with one nesting record from the Owens Valley, Inyo County. Non-breeding birds may also be found during the summer on portions of the California coast and in the Central Valley. Preferred winter habitats include large coastal estuaries, upland herbaceous areas, and croplands (Zeiner et al. 1990).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the long-billed curlew in the vicinity of the Project. No such records were identified through this effort. The curlew apparently does not nest or winter in the ENF (USDA 2001a), but birds may rarely cross over the westernmost portion of the Project transmission line during migration.

California Gull (CSC - nesting colonies)

The California gull is a fairly common nester at alkali and freshwater lacustrine habitats east of the Sierra Nevada and Cascades, and an abundant visitor to coastal and interior lowlands during the nonbreeding season (Grinnell and Miller 1944). In April, the species begins to depart for breeding grounds, with the California's nesting population scattered across the northeastern plateau region and at Mono Lake. Evidence of former breeding exists for the Central Valley

(Dawson 1923) and the first recorded estuarine colony, established on two islands in a salt pond on San Francisco Bay, grew from about 30 nests in 1980 to 670 nests in 1983 (Rigney 1983). In late summer, the California gull migrates westward across the Sierra Nevada from interior nesting grounds to winter in California and the Pacific Northwest (Cogswell 1977).

Inland birds frequent lacustrine, riverine, and cropland habitats, landfill dumps, and open lawns in cities (Grinnell and Miller 1944). It is often among the most abundant species throughout its winter range in California. In winter, this omnivore feeds on garbage, carrion, earthworms, adult insects, and larvae. On breeding grounds, the young are fed larval insects, brine shrimp, young birds, garbage, earthworms, and insects (Zeiner et al. 1990).

The California gull nests from mid-April through mid-August, with peak nesting occurring in late May through June. It usually nests in colonies, and often in association with other water birds (Harrison 1978). The clutch size averages two eggs (Harrison 1978) and both parents incubate over a 23 to 27-day period. The young are precocial and capable of flight 35 to 41 days after hatching (Smith and Diem 1972).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the California gull in the vicinity of the Project. No nesting records were identified through this effort but the species is seasonally common throughout the Project and is expected to occur on all larger project reservoirs and other suitable habitats.

Black Tern (FSC, CSC, MNBMC - nesting colonies)

The black tern was formerly a very common spring and summer visitor and breeder at fresh emergent wetlands of California, including Lake Tahoe (Grinnell and Miller 1944). Numbers have declined throughout the range, especially in the Central Valley (Cogswell 1977). Today, the black tern breeds primarily in wetlands of the northeastern plateau of California in Modoc County. It prefers wetland complexes of at least 49 acres (USDA 2001a), especially habitats where shallow open water is interspersed with emergent vegetation. It is currently a fairly common migrant and breeder on wetlands of the northeastern plateau area, but is absent from some historic nesting localities such as Lake Tahoe (Cogswell 1977). Despite the presence of apparently suitable habitat in rice farming areas, breeding is questionable in the Central Valley (Gaines 1974). Although restricted to freshwater habitats while breeding, black terns can be fairly common on bays, salt ponds, river mouths, and pelagic waters during spring and fall migration (Grinnell and Miller 1944; Cogswell 1977).

The black tern breeds in North America and winters in Central and South America. It typically disperses to its nest marshes in mid to late May, where they nest semi-colonially in emergent wetlands. It nests on floating plant matter, which leaves them vulnerable to storms, wave action, and rapid water level fluctuations, such as floods. Clutch size ranges between two to four eggs, which both sexes incubate for 19 to 22 days. Chicks are able to run, swim, and walk at two days old, and are fully fledged at about four weeks old. Fall movement by adults may begin by late July and extend through October. Juveniles migrate approximately one month later than adults.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the black tern in the vicinity of the Project. No nesting records were identified through this effort. Individuals may occur rarely at reservoirs in the Project area during migration.

Forster's Tern (FSV)

The Forster's tern is common to abundant along the coast of California in marine subtidal and estuarine waters from May to September (Zeiner et al. 1990). It is also common to uncommon inland at open lacustrine and riverine habitats. In California, the species nests primarily on salt-pond levees and low islands in emergent wetlands and bays (Cogswell 1977). However, the Forster's tern also nests very locally in the interior of northern California (McCaskie et al. 1979), especially in the northeastern plateau and Central Valley (Cogswell 1977). There is a southward migratory movement in fall, with most of the northern California population wintering from October through April in southern California south to South America.

The species breeds from late April to mid-September, with a peak in June and July. The Forster's tern is monogamous, colonial nesters. Nesting occurs on open to fairly open levees and low islands in lakes, salt ponds, or lagoons. Forster's terns may also use floating vegetation (Cogswell 1977). Nesting colonies are generally less than 330 feet from open water and the nest is a scraped depression in soil; sometimes lined with bones, sticks, or mud clods. The average clutch size is 2.6 eggs and both adults take part in incubation, which lasts 23 days. Hatching is closely synchronized between colony members. The semi-altricial young wander from the nest within one week and are cared for by both parents.

The Forster's tern feeds mainly on small fish in saltwater and freshwater habitats, but also aquatic insects, crustaceans, and small amphibians. They roost on pilings, low boardwalks, and floating objects or gather in small, dense flocks along open shores.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the Forster's tern in the vicinity of the Project. They historically nested at Rowland's Marsh on the south shore of Lake Tahoe about 15 to 20 miles east of the Project, but most of the suitable breeding habitat at Rowland's Marsh was lost to development of the Tahoe Keys resort. Forster's terns are still seen regularly along the Lake Tahoe shoreline but recent nesting has not been confirmed. No nesting records have been discovered for the Project area. However, individuals may occur irregularly at reservoirs in the Project area in late summer and during migration.

Band-Tailed Pigeon (FSV, HA)

The band-tailed pigeon occurs year-round in all national forests in California except the Modoc National Forest, where it only occurs in the winter. They are altitudinal migrants, moving upslope in summer and downslope in winter. The band-tail is closely associated with hardwood and hardwood-conifer forests, and is highly dependent on acorns for foraging year-round (USDA 2001a). In addition to acorns, it also feeds on fruits of trees and shrubs such as madrone, dogwood, cascara, elderberry, and manzanita, among others (Zeiner et al. 1990). The band-tailed pigeon prefers large trees and multi-layered forests with a light understory, and open to medium

canopy closures. Mineral sites are also visited regularly and a nearby water source is considered important.

The breeding season extends from February to mid-October, with a peak in May. The band-tailed pigeon is most commonly found in thick cover such as alder thickets, or groves of conifers or oaks. The nest site is usually near water and the birds require a tree taller than the canopy within their nesting territory to use as a cooing perch and for display flights. They usually lay only one egg per clutch, but sometimes two. Incubation is shared by both sexes for a period of 18 to 20 days. The young are fed crop milk by parents during the brood period and the young fledge in 12 to 14 days.

The band-tailed pigeon is a harvest species in California with an estimated take of 15,500 birds during the 2000-2001 hunting season. Breeding Bird Survey data collected between 1980 and 1998 show significantly declining trends in the Sierra Nevada and throughout the Pacific. Although hunting regulations have been severely restricted since the late 1980s, including reduced take limits and shortened seasons, there has been no apparent effect on band-tailed pigeon population size (USDA 2001a). The primary threat to the species is the reduction of oaks statewide. However, the species continues to be widespread in the Sierra Nevada despite apparent population declines.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the band-tailed pigeon in the vicinity of the Project. Christmas Bird Count records and anecdotal reports indicate that they are relatively common and widespread throughout suitable habitat in the ENF and can be expected to occur in the vicinity of Project features.

Western Yellow-Billed Cuckoo (CE, MNBMC)

The western yellow-billed cuckoo bred historically from southern British Columbia, to western and southeastern Idaho, to central Utah and western Colorado, south through the western half of New Mexico and extreme western Texas, and south through Sonora, Mexico to Zacatecas, Mexico, including southern Baja California, and southern California (Laymon 2000). The western cuckoo is believed to winter primarily in northwestern South America. The western subspecies has been extirpated from approximately 53 percent of its original range. There are estimated to be less than 40 breeding pairs in California at only two major locations (Laymon 2000).

Early accounts described the species' range in California as the coastal valleys from the Mexican border to Sebastopol, Sonoma County and the Central Valley from Bakersfield and Weldon, Kern County, north to Redding, Shasta County, and in Surprise Valley, Modoc County. Populations were also found in suitable habitat east of the Sierra Nevada in the Owens Valley and along the Colorado and Mojave rivers (Laymon 1998). Current breeding populations of greater than five pairs that persist each year in California are limited to the Sacramento River from Red Bluff to Colusa and the South Fork Kern River from Isabella Reservoir to Canebrake Ecological Reserve (Laymon 1998).

A statewide survey of cuckoos in California during 1986 and 1987 found a total of 30-33 pairs and 31 unmated males at nine locations (Laymon and Halterman 1989). The majority of these birds were concentrated along the upper Sacramento River from Red Bluff to Colusa (18 pairs and 19 unmated males) and at the South Fork Kern River (7 pairs and 3 unmated males). More recent surveys on the Sacramento River from 1987-1990 showed a fluctuating population of 23-35 pairs (Halterman 1991). Other sites where small populations of cuckoos (< 5 pairs) breed or possibly breed (but not necessarily every year) are: the Feather River from Oroville to Verona, Butte, Yuba and Sutter counties; the Prado Flood Control Basin, San Bernardino and Riverside counties; the Amargosa River near Tecopa, Inyo County; the Owens Valley near Lone Pine and Big Pine, Inyo, County; the Santa Clara River near Santa Clarita, Los Angeles County; the Mojave River near Victorville, San Bernardino County; and the Colorado River from Needles, San Bernardino County to Yuma, Imperial County (Laymon and Halterman 1987).

The yellow-billed cuckoo in the west is associated strictly with riparian habitat, particularly cottonwood-willow habitat, and with most nests placed in willows (Gaines and Laymon 1984; Laymon and Halterman 1987; Franzreb and Laymon 1993; Hughes 1999). Historic nesting locations in California range from near sea level in southern California to about 4,600 feet in the Owens Valley near Big Pine. Known breeding sites in the Sacramento Valley range from about 49 feet to 262 feet. Patch size is a significant factor in nest site selection with majority of known nest sites in California located in patches greater than 100 acres in size (Laymon 1998). Laymon and Halterman (1989) concluded that sites > 200 acres in extent and wider than 1,950 feet were optimal, sites 101-200 acres in extent and wider than 650 feet were suitable, sites 50-100 acres in extent and 325-650 feet in width were marginal, and sites < 38 acres in extent and < 325 feet in width were unsuitable.

In California, the cuckoo arrives on its breeding grounds from early to mid-June, with a few of the earliest arrivals in late May. The earliest spring arrival record for California is 23 April in Sacramento County, but this is the only April record for the state (Gaines and Laymon 1984). The next earliest arrival date is 1 May, which occurred twice, once in Yuba and once in Sutter counties. An average of 17 first arrival dates for Northern California was 31 May. The earliest nesting records in California are 15-16 May and the third earliest date is 15 June (Gaines and Laymon 1984). Most nesting is initiated in late June to mid-July but may continue into early September (Laymon 2000). Clutches may range from two to six eggs with three eggs being most common. Both sexes generally share equally in incubation, with the exception that males do all of the nocturnal incubation (Laymon 1998). The incubation period is 11 to 12 days and the nestling period is five to eight days. Fledgling cuckoos are tended by their parents equally for at least two weeks after leaving the nest.

The western yellow-billed cuckoo is primarily a foliage gleaner with the preferred food of the species in California reported to be sphinx moth larvae, with a lesser diet of tree frogs, grasshoppers, cicadas, or katydids (Laymon 2000).

Throughout its range, loss of large tracts of riparian habitat is considered the primary threat to the yellow-billed cuckoo. Along the Sacramento River, native riparian trees have been replaced in many locations by domestic fig and black walnut, which offer little nesting or foraging value to

cuckoos. Human disturbance is rarely a factor affecting the cuckoo in California (Laymon 1998). The cuckoo nests and forages in hot, humid, vegetation-tangle, and insect infested habitats rarely visited by people. Nesting cuckoos can be disturbed by visits to a nest site and will not return to a nest after being flushed when humans are in a direct line of sight nearer than about 50 meters. However, foraging cuckoos are nearly oblivious to human presence (Laymon 1998).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the yellow-billed cuckoo in the vicinity of the Project. No nesting records are available for this area and large tracts of suitable riparian habitat are not known to occur. In addition, the project is well above the elevation range of known nesting locations in the Central Valley as described above. As a result, the species is not expected to occur in the project area.

Burrowing Owl (FSC, CSC, MNBMC - burrow sites)

In California, the burrowing owl is a yearlong resident of: 1) open, dry grassland and desert habitats and 2) in grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitats. The species was formerly common in appropriate habitats throughout the state, excluding the humid northwest coastal forests and high mountains. However, their numbers are markedly reduced in recent decades, primarily due to conversion of grassland to agriculture and urbanization, and also poisoning of ground squirrels with a subsequent loss of suitable burrows. They are found as high as 5,300-feet elevation in the Sierra Nevada in Lassen County.

The burrowing owl feeds primarily on insects but will also take small mammals, reptiles, birds, and carrion. They use small mammal burrows, and occasionally pipes and artificial burrows for roosting and nesting cover, and may dig their own burrow in soft soil. The nest chamber is usually lined with excrement, pellets, debris, grass, and feathers. Breeding occurs from March through August, with the peak in April and May. The clutch size averages five to six eggs. Young emerge from burrow at about two weeks and fly at about four weeks of age.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of burrowing owl in the vicinity of the Project. No nesting records are available for this area. However, marginal habitat exists in open grassland areas that remain along the western portion of the Project transmission line.

California Spotted Owl (FSC, FSS, CSC, MIS)

Little information is available on the historic distribution, abundance, and habitat associations of California spotted owl in the Sierra Nevada (USDA 2001a). The subspecies now ranges from south of the Pit River in Shasta County, throughout the entire Sierra Nevada, and the south and central Coast Ranges as far north as Monterey (USDA 2001a). Based on CDFG records through 1999, a total of 1,452 owl sites are known from within national forest boundaries in the Sierra Nevada. Of these, 231 spotted owl sites have been recorded within the ENF since 1987 including 172 pairs, 41 territorial singles, and 18 singles. The elevation of known nest sites ranges from about 1,000 to 7,700 feet, with about 86 percent occurring between 3,000 and 7,000

feet. In some areas, the spotted owl has been found to migrate downslope in the fall to distinct wintering habitats (Laymon 1989).

The exact habitat requirements of the California spotted owl is currently a matter of scientific debate, although it has been found to inhabit a broader array of habitat conditions than the northern spotted owl (Moen and Gutierrez 1997). Call et al., (1992) discovered that the number of vegetative strata, high old-growth and mature basal tree area, and high canopy closure were the most important distinguishing characteristics of forest stands used by the California spotted owl. The Sierra Nevada Forest Plan Amendment (USDA 2001a) notes that four vegetation types provide the spotted owl habitat on the west slope of the Sierra Nevada: 1) foothill riparian/hardwood; 2) ponderosa pine/hardwood; 3) mixed-conifer forest; and 4) red fir forest. The mixed conifer type receives the most use with about 80 percent of known sites located in this type. In general, stands suitable for owl foraging have: 1) at least two canopy layers; 2) dominant and codominant trees in the canopy averaging at least 11 inches dbh; 3) at least 40 percent canopy cover in overstory trees (30 percent in the red fir type); and 4) higher than average numbers of snags and downed woody material. Nesting and roosting stands, in general, have: 1) two or more canopy layers; 2) dominant and codominant trees in the canopy averaging at least 24 inches dbh; 3) at least 70 percent total canopy cover; 4) higher than average levels of very large, old trees; and 5) higher than average levels of snags and downed woody material.

The spotted owl breeding season extends from about mid-February through September (USDA 2001a). The egg laying through incubation period extends from early April through May, and young owls typically fledge in mid- to late-June. In the weeks after fledging the young are very weak fliers and remain near the nest tree. Adults continue to feed the young until late September.

The spotted owl above the mid-elevation conifer forests of the Sierra Nevada (about 4,000 to 5,000 feet) prey mainly on flying squirrels. The owl in the mid-to-lower elevations of the mixed-conifer zone, and the upper part of the ponderosa pine zone, prey heavily on both flying squirrels and woodrats. The owl in the foothill riparian/hardwoods consume primarily woodrats.

The USFS has been directed by the Forest Plan Amendment (USDA 2001a) to establish 300-acre PACs around all known and newly discovered territories detected on national forest lands since 1986. PACs are intended to contain the best available habitat as described above. PACs are maintained regardless of occupancy status, unless the habitat is rendered unsuitable by a catastrophic stand-replacing event (e.g., fire) and surveys confirm non-occupancy (USDA 2001a). Fuel treatment and vegetation management activities are limited within PACs. In addition, LOPs prohibit activities within approximately one-quarter of a mile to a nest site during the breeding season (March 1 through August 31) unless surveys confirm that the spotted owl is not nesting. LOPs do not apply to existing road and trail use and maintenance or continuing recreation use, except where analysis of a proposed project or activity indicates that disturbance to a nest is likely to result. The LOP may also be waived for individual projects or activities of limited scope and duration, or when a biological evaluation documents that such projects are unlikely to result in breeding disturbance. Where a biological evaluation determines that a nest site will be shielded from planned activities by topographic features that minimize disturbance, the LOP buffer distance may be reduced.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of California spotted owl in the vicinity of the Project. ENF biologists have conducted protocol-level surveys for the spotted owl since 1989 and have documented numerous detections of the spotted owl from within the ENF boundaries (ENF 1997). Numerous PACs have also been delineated including several adjacent to Project features (see Appendix E5-2).

Table E5.2-2. California Spotted Owl PACs in the vicinity of Project features.

Project Feature	Approximate Location of Protected Activity Centers in the Project area.
Gerle Creek	Two PACs along Gerle Creek from 1-3 miles north of Gerle Creek Reservoir
Gerle Creek Reservoir	One PAC on the south side of the reservoir; One PAC about 1 mile east of reservoir between Angel Creek & Rubicon River
Union Valley Reservoir	Two PACs along road between Gerle Creek Reservoir and Union Valley Res.; One PAC adjacent to west shore of reservoir; One PAC about 0.5 mile east of reservoir and just north of Big Silver Creek;
Ice House Reservoir	One PAC adjacent to west shore of reservoir; One PAC adjacent to east shore of reservoir
Silver Creek, Jay Bird Creek, Brush Creek, Slab Creek	Several scattered along these streams in vicinity of project reservoirs and tributaries

Great Gray Owl (CE, FSS - nesting)

In the Sierra Nevada, the great gray owl has a restricted distribution centered on Yosemite National Park, with scattered pairs occurring on the Stanislaus, Sierra, Inyo, and Humboldt-Toiyabe National Forests (USDA 2001a). Most occurrences are between 4,500 and 7,500 feet elevation (Zeiner et al., 1990). They require a unique combination of habitats and habitat elements and generally occupy mixed conifer and red fir forests adjacent to meadows where they feed mostly on voles and gophers. This owl is an altitudinal migrant depending on prey and weather conditions and depends on high quality foraging habitat (meadows) throughout their range in the Sierra Nevada (USDA 2001a).

The great gray owl nests primarily in large diameter, broken top snags or large stick nests constructed by raptors or ravens located along the edges of meadows used for foraging. The peak of egg laying is probably March through May with an average clutch size of three eggs (Zeiner et al., 1990). Incubation (by the female only) lasts about 30 days and the young fledge at 21 to 28 days or more. The species has declined in the Sierra Nevada primarily because of logging of old-growth forest and livestock grazing in mountain meadows.

The USFS has been directed by the Forest Plan Amendment (USDA 2001a) to establish 50-acre PACs around all known great gray owl nest stands on ENF lands. PACs are intended to contain the highest quality nesting habitat available in the forested area and adjacent meadow surrounding the nest. Vegetation management and road construction activities are limited within PACs. LOPs for these activities are applied within one-quarter mile of an active great gray owl nest stand during the nesting period (typically March 1 to August 15). The LOP does not apply to: 1) existing road traffic and maintenance; 2) trail uses; and 3) other recreational uses and activities; unless a biological evaluation documents that these activities will result in nest disturbance. The LOP may also be waived for individual projects or activities of limited scope

and duration. The USFS is also directed to maintain herbaceous meadow vegetation at least 12-inches in height and covering at least 90 percent of the meadow if located within a great gray owl PAC.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the great gray owl, PACs, or potential habitat for the species in the vicinity of the Project. No observations of the great gray owl are known from the vicinity of the Project or within the ENF, and no PACs have been designated. However, the ENF has delineated several areas offering potential habitat including several sites near Project features (see Appendix E5-2). These sites include meadow complexes around Rubicon Reservoir, upper Gerle Creek, Tells Creek, Bassi Fork, the north side of Union Valley Reservoir, and Bosworth Meadows near the southeast corner of Union Valley Reservoir.

Long-Eared Owl (CSC, FSV - nesting)

The long-eared owl is an uncommon resident or winter visitor throughout most of the northern part of the state, excluding the humid North Coast Range, Cascade Range, and higher elevations of the Sierra Nevada (Zeiner et al., 1990). Resident populations in the state have been declining since the 1940s, especially in Southern California (Grinnell and Miller 1944, Remsen 1978). Although not all the reasons for this decline are known, the destruction and fragmentation of riparian habitat and live oak groves have been implicated as factors (Remsen 1978). The long-eared owl apparently make only local movements in California, although some limited migration may occur including seasonal movement westward from the Sierra Nevada foothills in the fall.

The breeding season for the long-eared owl extends from early March to late July. Nesting occurs from blue oak woodlands up to ponderosa pine and black oak plant communities, particularly near riparian habitat. Long-eared owl nests are usually those abandoned by magpies, crows, hawks, or herons. Egg laying typically occurs in April and May with an average clutch of four to five eggs. Incubation, performed by the female alone, lasts 21 to 28 days. Nestlings fledge in about 50 days or less.

The long-eared owl is a nocturnal hunter and preys on rodents and birds. They usually hunt in open areas, and occasionally in woodland and forested habitats. Riparian or other thickets with small, densely canopied trees are required for roosting.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the long-eared owl in the Project area. No such occurrences were identified through this effort, although suitable habitat for the species exists.

Short-Eared Owl (CSC, MNBMC - nesting)

The short-eared owl was formerly a resident locally throughout much of California, excluding higher elevations. It is a widespread winter migrant, found primarily in the Central Valley, in the western Sierra Nevada foothills, and locally in the southern desert region. The short-eared owl is usually found in open areas with few trees, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands. The species

occasionally still breeds in northern California. However, numbers have declined over most of the range in recent decades because of destruction and fragmentation of grassland and wetland habitats, and grazing (Remsen 1978).

The short-eared owl feeds primarily on voles and other small mammals, although birds are an important food source in coastal wintering areas, and during the nesting season. They will also eat reptiles, amphibians, and arthropods.

The short-eared owl breeds from March through July with the nest usually in a depression on dry ground concealed in vegetation, and lined with grasses, forbs, sticks, and feathers. Egg laying occurs in April and May with an average clutch size of five to seven eggs. Incubation, performed by the female alone, lasts 21 to 28 days. Fledging occurs at about 31 to 36 days.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the short-eared owl in the vicinity of the Project. No nesting records are available for this area. However, marginal habitat exists in open grassland areas that remain along the western portion of the Project transmission line.

Black Swift (CSC, MNBMC - nesting)

The black swift breeds very locally through 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 probably to San Luis Obispo County. It seems to avoid arid regions such as the Great Basin, southern deserts, and Central Valley. The black swift migrates south for the winter and are mostly absent in California from October through April.

The black swift breeds from early June to late August. Nests are generally established in small colonies on inaccessible cliff faces or ledges behind or adjacent to waterfalls. Incubation lasts 24 to 27 days and fledging occurs at about 45 days. The black swift forages widely over many habitats and feed entirely on flying insects during sustained, long-distance foraging flights. The species does not winter in California.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the black swift in the Project area. No specific occurrences were identified through this effort, although suitable habitat is present and the species is expected to occur.

Vaux's Swift (CSC, MNBMC - nesting)

The Vaux's swift is a summer resident of northern California and breeds the length of the Sierra Nevada in mature woodlands with hollow trees and snags. It is a fairly common migrant throughout most of the state in April and May, and August and September. A few birds winter irregularly in southern coastal lowlands (Grinnell and Miller 1944, McCaskie et al. 1979) but most migrate to Mexico and Central America.

The Vaux's swift breeds from early May to mid-August. Incubation, with an average clutch of four to five eggs, lasts 18 to 20 days. Fledging occurs in about 28 days (Harrison 1978). They forage over streams and high above the canopy in many vegetation types. Prey consists exclusively of flying insects.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the Vaux's swift in the Project area. No specific occurrences were identified through this effort, although suitable habitat is present and the species is expected to occur.

Rufous Hummingbird (MNBMC - nesting)

The rufous hummingbird is a common migrant and uncommon summer resident of California (Zeiner et al., 1990). Limited breeding in Trinity and Humboldt counties has been confirmed in recent years (McCaskie et al., 1979). Many postbreeders migrate south through the Cascade Range and Sierra Nevada in summer, although spring migration mostly is through the lowlands and foothills (Grinnell and Miller 1944). It is found in a wide variety of habitats that provide nectar-producing flowers, and uses valley foothill hardwood, valley foothill hardwood-conifer, riparian, and various chaparral habitats in both northward and southward migration. During southward migration, the rufous hummingbird uses montane riparian, aspen, and high mountain meadows (to tree-line and above).

The rufous hummingbird arrives in California in February and migrates north through lowlands and foothills until mid-April and early May. Post-breeding males begin to migrate back through California in late June and early July. This early appearance of males in the Sierra Nevada has led some observers to suspect that breeding may occur in the Range but it has not been confirmed. Most individuals are gone by mid-September, but a few regularly overwinter, particularly in southern California.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the rufous hummingbird in the Project area. No specific occurrences were identified through this effort, although suitable habitat is present and the species is expected to occur during migration. Nesting is not believed to occur in the Sierra Nevada.

Pileated Woodpecker (MIS)

The pileated woodpecker is resident in mature, montane conifer forests throughout most of the Sierra Nevada north of Kern County. The preferred habitat for the species appears to be Douglas-fir, white fir, and red fir forests with greater than 40 percent canopy cover and numerous large snags, stumps and logs. While not common, the pileated woodpecker is observed frequently throughout the Sierra Nevada.

The pileated woodpecker feeds primarily on animal foods, and especially on carpenter ants, although beetles and various insect larvae are also taken. They forage on decayed and live tree trunks, snags, logs, and stumps over 7 inches in diameter (Bull and Meslow 1977). Feeding areas generally have less than 10 percent ground cover of logs. In Oregon, Bull and Meslow

(1977) recommended a foraging habitat of 500 to 1,200 acres with a core of 100 acres of nesting habitat, and at least 90 snags per square mile over 20 inches dbh.

This woodpecker breeds from early March to early July, with peak activity in early May to mid-June. They nest in coniferous and deciduous snags or living trees with dead limbs and generally select the largest snag or tree, at least 20 inches dbh, in a dense stand (Harris 1982). The nest cavity is usually 15 to 70 feet above the ground, with an average of 42 feet. The entrance hole is typically oblong and measures about 4 by 3 inches. A new cavity is excavated each breeding season. The clutch averages four eggs and incubation lasts about 18 days. Fledging occurs at 26 to 28 days. Males and females apparently pair for life. Pileated woodpeckers apparently require a water source near the nest (Pfitzenmeyer 1956).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the pileated woodpecker in the Project area. The species is known to occur and nest in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001) and at least two documented records are known from the north and east sides of Union Valley Reservoir (ENF 1999). Suitable habitat exists within the Project area and the species is expected to occur.

Olive-Sided Flycatcher (FSV, MNBMC - nesting)

The olive-sided flycatcher is a neotropical migratory species that arrives in California from mid-April to early May (USDA 2001a). It leaves breeding areas in August, and most leave the state and fly to wintering areas in Central and South America by early October. In California, they are uncommon to common summer resident in a wide variety of forest and woodland habitats below 9,000 feet throughout the state, exclusive of the deserts, the Central Valley, and other lowland valleys and basins. In the western Sierra Nevada, they are considered fairly common during the summer in mid-elevation forests.

No specific information exists to indicate that the species' distribution in California has been reduced from historical conditions (USDA 2001a). However, it is likely that relatively small or localized retractions in range have occurred due to habitat loss from land development practices. BBS data indicate widespread population declines in the olive-sided flycatcher populations. BBS trends for the period 1966 through 1999 show a 3.7 percent annual decrease in the Sierra Nevada. However, the BBS data also show that the highest abundance for this species in its range occurs in the Sierra Nevada (USDA 2001b). The primary threat to the species is believed to be habitat loss and degradation on the species' wintering grounds in Central and South America.

The olive-sided flycatcher prefers to nest in mixed conifer, montane hardwood-conifer, Douglas-fir, red fir, and lodgepole pine. They are most often associated with forest openings, forest edges near natural openings (e.g., meadows, canyons, rivers) or human-made openings (e.g., clear-cuts, burned areas). Numerous studies in the western United States, including three studies in Sierra Nevada conifer forests, found this species to be more abundant (and sometimes exclusively found) in burned forests than in adjacent unburned forest (Altman and Sallabanks 2000). They also require tall, prominent trees and snags for singing and foraging perches, and unobstructed air

spaces for foraging on flying insects (Altman and Sallabanks 2000). Nesting and roosting usually occur in large, tall trees, usually conifers.

The olive-sided flycatcher breeds from May through late-July, with the peak of egg laying in June. The clutch size averages three eggs and incubation lasts for about 14 days. Fledging occurs at 15 to 19 days. The nest is typically an open cup of grasses, mosses, lichens, rootlets, or pine needles placed in a conifer 5 to 70 feet above ground and well out on a horizontal limb (Bent 1942).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of olive-sided flycatcher in the Project area. No specific records were found as a result of this search but suitable habitat is present and the species is expected to be a relatively common breeder in the Project area.

Little Willow Flycatcher (FSC, CE, FSS, MIS - nesting)

Historically, the willow flycatcher nested throughout California wherever thickets of riparian deciduous shrubs, primarily willow (*Salix* spp.) occurred (Grinnell and Miller 1944). In the Sierra Nevada, the willow flycatcher historically occurs most commonly from the foothills up to about 6,000 feet elevation, but numerous records also exist from above 6,000 feet (USDA 2001a). In the last four decades, breeding populations have been extirpated from most lower elevation riparian areas in California. It appears that the species no longer breeds at elevations below 3,000 feet in the Sierra Nevada, and populations above 3,000 feet have declined as well. Factors implicated in the early decline of the willow flycatcher in the Sierra Nevada include livestock grazing, mining, water diversions, and logging during the late 1800s, which affected the hydrology and vegetation of meadows and riparian areas. More recent declines are attributed to wintering ground deforestation, increased human development in the Sierra Nevada, pesticides, recreation, effects on aquatic larvae of invertebrate prey due to stream impacts, and perhaps most importantly, nest parasitism by the brown-headed cowbird (USDA 2001a). Within the Sierra Nevada, cowbirds associate with pack stations, corrals, supplemental feed, livestock holding facilities, campgrounds, picnic areas, and rural communities. Current estimates of the willow flycatcher on Sierra Nevada national forests range between 300 to 400 individuals. The species is recognized by the USFS as the highest-priority landbird species in the Sierra Nevada bioregion because it is considered to have the highest probability of being extirpated from the bioregion in the near future (USDA 2001a).

Three willow flycatcher subspecies breeds in California, *Empidonax traillii adastus*, *E.t. brewsteri*, and *E.t. extimus*. Of these three subspecies, only the range of *E.t. brewsteri* includes the Project area. It breeds in shrubby vegetation (specifically willows) in meadow and riparian communities. The shrub layer is typically 6.5 to 13 feet in height, with the lower 6.5 feet comprised of dense woody vegetation. The mean shrub cover within the willow flycatcher territories has been documented at 21,529 square feet (0.5 acres), but in some cases as they have used as little as 1,076 square feet (0.02 acres) of shrub cover for nesting. Meadows used for nesting range in size from 1 to 716 acres, with a mean of 80 acres (USDA 2001a). Recent surveys indicate that the species occurs at elevations from 1,200 to 9,500 feet, although most of the known nest sites are between 4,000 and 8,000 feet. There is usually some surface water or

saturated soil within defended territories during the early part of the nesting season (Valentine 1987).

In the Sierra Nevada, the little willow flycatcher breeding season occurs from late May or early June (territory establishment) to the middle of September (fledgling independence). Most young fledge between approximately July 15 and August 31 and fledglings remain in the territory for 2 to three weeks post-fledging. Willow flycatchers feed primarily on insects, many of which have aquatic larval stages.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the willow flycatcher or potential habitat for the species in the vicinity of the Project. No active nest territories are known from the vicinity of the Project. However, the ENF has delineated several areas offering potential habitat including several sites near Project features (see Appendix E5-2). These sites include meadow complexes around Rubicon Reservoir, upper Gerle Creek, upper Rubicon River, upper Silver Creek, and Bosworth Meadows near the southeast corner of Union Valley Reservoir. Potential willow flycatcher habitat, as defined by the Sierra Nevada Forest Plan Amendment (USDA 2001a), includes: 1) occupied habitat; 2) known willow flycatcher sites; and 3) emphasis habitat (i.e., meadows less than 15 acres that have standing water on June 1 and a deciduous shrub component). Occupied habitats are meadows or riparian sites with documented willow flycatcher occupancy, unless: 1) multiple surveys, completed to protocol, document a lack of occupancy, 2) all documented occurrences are outside the regional survey protocol for determining willow flycatcher occupancy during the breeding season, or 3) habitat type conversion has occurred.

~~Loggerhead Shrike (FSC, CSC)~~
The loggerhead shrike is a common resident and winter visitor in lowlands and foothills throughout California (Zeiner et al. 1990). Although populations have declined elsewhere, they have remained fairly stable in the Pacific states (Morrison 1981). The species prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. The shrike densities appear to be highest in open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. They occur only rarely in heavily urbanized areas, but are often found in open cropland, and sometimes use edges of denser habitats (Grinnell and Miller 1944; McCaskie et al., 1979).

In California, the loggerhead shrike lays eggs from March into May with four to eight eggs per clutch. Incubation lasts 14 to 15 days and the altricial young fledge in about 18 to 19 days. Young may be driven off the parents' territory two to three months after fledging. They feed mostly on large insects, but will also take small birds, mammals, amphibians, reptiles, fish, and carrion (Zeiner et al. 1990).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the loggerhead shrike in the vicinity of the Project. No specific records were found during this effort. However, suitable

habitat exists in open woodland and grassland areas surrounding the project, primarily along the western portion of the Project transmission line.

California Horned Lark (CSC)
The horned lark is a common to abundant resident in a variety of open habitats throughout California. The species is found from grasslands along the coast and deserts near sea level to alpine dwarf-shrub habitat above treeline. It is less common in mountain regions (McCaskie et al. 1979), and in coniferous or chaparral habitats. The horned lark generally leaves the mountains in the winter, but small flocks may remain to winter on windswept, snow-free areas at high elevations in the Sierra Nevada (Gaines 1977).

The California horned lark breeds from March through July, with peak activity in May. Nests are usually grass-lined depressions on the ground in open areas. The clutch averages three to four eggs and incubation lasts about 10 to 14 days. Both parents tend the altricial young and the young leave the nest at 9 to 12 days, and can fly three to five days later (Harrison 1978). After breeding, the horned lark becomes very gregarious, often forming large flocks that forage and roost together. Migrants from outside of California join these wintering flocks, especially in the southeastern desert region of the state. The horned lark feeds mostly on insects, snails, and spiders during breeding season, and add grass and forb seeds and other plant matter to diet during other seasons (Bent 1942).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the California horned lark in the vicinity of the Project. No specific records were found during this effort. However, suitable habitat exists in open grassland areas surrounding the project, at the higher elevations in Desolation Wilderness and along the western portion of the Project transmission line. The species is expected to occur and nest within the Project area.

Purple Martin (CSC, FSV - nesting)
The purple martin is uncommon to rare, local summer residents in a variety of wooded, low-elevation habitats throughout the state. The species is a rare migrant in spring and fall and absent in winter. The purple martin uses valley foothill and montane hardwood, and riparian habitats. They also occur in coniferous habitats, including closed-cone pine-cypress, ponderosa pine, Douglas-fir, and redwood. The purple martin breeds locally west of the Cascade and Sierra Nevada mountains and winter in South America (USDA 2001a). The Pacific Coast population of purple martin is apparently declining, in some areas drastically (Garrett and Dunn 1981). The most limiting factor for the scattered populations in the western portion of their range appears to be a lack of snags coupled with increased competition for suitable nest sites from introduced house sparrows and European starlings.

Preferred habitat for the purple martin consists of lower coniferous forests, oak woodlands and riparian habitats with snags and nearby water. Their diet consists of beetles, bugs, dragonflies, bees and wasps, butterflies, and other insects. The breeding season extends from April into August, with peak activity in June. The average clutch is four to five eggs and the altricial young leave the nest after a 24 to 31 fledging period. They often nest in old woodpecker cavities, and

sometimes in artificial structures (e.g., nest box), under bridges, and in culverts. Nest most often located in a tall, old, isolated tree or snag in open forest or woodland (Dawson 1923). They are reported to be less likely to use nest boxes in California relative to areas as in the eastern United States

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the purple martin in the vicinity of the Project. No specific records were found during this effort. However, suitable habitat exists through much of Project. The species is expected to occur on an irregular basis within the Project area.

Bank Swallow (CT, FSV - nesting)

The bank swallow is a neotropical migrant found primarily in riparian and other lowland habitats in California (Zeiner et al. 1990). The species' range in California represents less than one percent of its entire range in the United States (Carter and Barker 1992). It is a spring and fall migrant in the interior of the state, less common on the coast, and an uncommon and very local summer resident. In summer, the bank swallow is restricted to riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils, into which it digs nesting holes. Suitable banks may be present along rivers, in quarries, natural cliffs, and road cuts. They are found in alluvial flood plains, so any substantial valley within the Sierra Nevada has the potential to have bank swallows if the other habitat criteria exist. However, the Sierra Nevada is considered to be on the periphery of the species' range (USDA 2001a). In migration, the bank swallow flocks with other swallows over a variety of open habitats.

The bank swallow arrives in California from South America in early March and numbers peak by early May. Numbers fall off in July and August as colonies are abandoned and migration begins. Colonies are vacant by late July or early August, and migrants are observed usually through early or mid-September. There are few winter records for California.

The bank swallow breeds from late April through July, with peak activity from mid-May to mid-June. Pairs usually nest colonially but sometimes solitarily or near a few other nests (Hoogland and Sherman 1976). Colonies range in size from about 10 to 1,500 nesting pairs in California, although most colonies have 100 to 200 nesting pairs (Garrison et al. 1987). Their burrows are 1.0 to 2.2 inches wide and average 34 inches deep. A small chamber at end of burrow contains the nest. The clutch size is usually four to five eggs and incubation lasts about 12 to 16 days. The altricial young are tended by both adults and leave the nest at 18 to 24 days (Harrison 1978).

Based on Breeding Bird Survey data from 1966 to 1991, the bank swallow is declining in California, but not in North America (USDA 2001a). The species range in California is estimated to be reduced 50 percent since 1900. It was formerly more common as breeder in California but now only approximately 120 colonies remain within the state. Perhaps 75 percent of the current breeding population in California occurs along the banks of the Sacramento and Feather rivers in the northern Central Valley. Currently, there are estimated to be 10,000 to

15,000 pairs in California (USDA 2001a). Channelization and stabilization of banks of nesting rivers are the major factors causing the marked decline in numbers in recent decades.

The bank swallow feeds by hawking insects during long, gliding flights, predominantly over open riparian areas, but also over brushland, grassland, wetlands, water, and cropland. They feed on a wide variety of aerial and terrestrial soft-bodied insects including flies, bees, and beetles.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the bank swallow in the vicinity of the Project. No specific records were found during this effort. USFS biologists interviewed for the Sierra Nevada Forest Plan Amendment did not indicate that the bank swallow or their habitat occur in the ENF (USDA 2001a). However, individuals may occur in the Project area during migration, or if new colonies are established in the future.

Swainson's Thrush (FSV)

The Swainson's thrush is common as a migrant and summer resident with wide variation in abundance within California (Garrett and Dunn 1981). It is found the length of the state in riparian habitats and in dense shrubs. The species is rare in the south and on the western slope of the Sierra Nevada in summer but common east of the Sierra Nevada crest from Modoc and Lassen counties through Mono County (Grinnell and Miller 1944). Individuals arrive in California in April from their wintering grounds in Mexico and Central America (Bent 1949). Their numbers peak in May, then decline slightly as many migrants continue to breeding grounds farther north. Numbers increase again in September with fall migration, then decline by the end of September as individuals return to the wintering grounds.

The Swainson's thrush has been declining in the Sierra Nevada for at least 50 years with a current annual decline of 2.6 percent per year (USDA 2001a). Marshall (1988) argued strongly that the cause for this decline was primarily deforestation on its neotropical wintering grounds. No obvious habitat changes have occurred to its breeding habitat in the Sierra Nevada to account for the declines (Siegel and DeSante 1999). However, logging, recreation, pesticide accumulation, and nest parasitism by cowbirds are considered to be threats to the breeding population (USDA 2001a).

Two subspecies can be found in the Sierra Nevada, *Cartharus ustulatus ustulatus* and *C. u. swainsoni*. The former is a rare summer breeder on the west slope of the Sierra from the foothills up to about 9,000 feet. The latter subspecies generally nests on the east slope of the Sierra Nevada. Both subspecies are reported to winter throughout the Sierra Nevada (USDA 2001a). The Swainson's thrush occupies wooded riparian habitats with a dense understory in summer. In migration, cover is provided by a variety of woodland and forest habitats with a dense understory, as well as by riparian areas.

The Swainson's thrush breeds from mid-April to mid-August, with peak activity in May and June. Pairs nest solitarily and lay an average of four eggs. Incubation lasts 10 to 13 days, and the altricial young are tended in the nest by both parents for 10 to 12 days (Harrison 1978). The Swainson's thrush feeds mostly on insects and spiders, but will also eat berries and other fruits.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the Swainson's thrush in the vicinity of the Project. No specific records were found during this effort. However, suitable habitat exists throughout the Project area and the species is expected to occur seasonally.

Yellow Warbler (CSC - nesting)

The yellow warbler is an uncommon to common, summer resident in northern California and locally common during summer in the south (Zeiner et al. 1990). The warbler breeds in riparian woodlands from coastal and desert lowlands up to 8,000 feet in the Sierra Nevada. It also breeds in montane chaparral and in open ponderosa pine and mixed conifer habitats with substantial amounts of brush. Birds usually arrive in California in April, and are mostly gone by October. Apparently there is a post-breeding, up-slope movement mostly to middle elevations (Beedy 1975). Small numbers regularly overwinter in southern California lowlands (Garrett and Dunn 1981).

Numbers of breeding pairs have declined dramatically in recent decades in many lowland areas (southern coast, Colorado River, San Joaquin and Sacramento valleys). The species is now rare to uncommon in many lowland areas where it was formerly common (McCaskie et al. 1979; Garrett and Dunn 1981). Brood parasitism by brown-headed cowbirds is heavy and apparently has been a major cause of the drastic decline in numbers in lowland localities in recent decades (Bent 1953; Garrett and Dunn 1981; Remsen 1978). Parasitism occurred in 9 of 25 nests or family groups in the Sierra Nevada where cowbirds were common (Rothstein et al. 1980; Airola 1986).

The yellow warbler breeds from mid-April into early August with peak activity in June. The clutch averages four to five eggs, and the female incubates for 11 days. Both parents tend the altricial young, until fledging at 9 to 12 days (Harrison 1978). The nest is an open cup placed 2 to 16 feet above ground in a deciduous sapling or shrub. Territory often includes tall trees for singing and foraging and a heavy brush understory for nesting (Ficken and Ficken 1966).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the yellow warbler in the vicinity of the Project. No specific records were found during this effort. However, suitable habitat exists throughout the Project area and the species is expected to occur in low numbers.

Yellow-Breasted Chat (CSC, MNBMC, FSV - nesting)

The yellow-breasted chat is an uncommon summer resident and migrant in coastal California and in foothills of the Sierra Nevada (Zeiner et al. 1990). Populations in California represent 1 to 10 percent of the species total distribution (Carter and Barker 1992). On the west slopes of the northern Sierra Nevada it is a rare summer resident and confirmed breeder from 1,000 to 1,500 feet and is an exceptionally rare (less than 10 records) transient up to 4,000 feet (DeSante 1995). Elsewhere, it has been recorded up to about 4,800 feet in valley foothill riparian on the west slope of the Sierra, and up to 6,500 feet east of the Sierra Nevada in desert riparian habitats (Zeiner et al. 1990). In migration, the species may be found in lower elevations of mountains in riparian habitat (McCaskie et al. 1979). Birds usually arrive in April and depart by late

September for wintering grounds in Baja California, Central Mexico, southern Texas, and the Yucatan, south to western Panama. Individuals may wander upslope post-breeding (Gaines 1977). There are a few late fall and winter records, mostly from southern California.

The species has declined drastically in numbers in the lower foothills of the west slope of the Sierra Nevada over the last 50 years (DeSante 1995). The primary factors in this decline are loss of riparian habitat due to water diversions, impoundments, exotic plant invasions (e.g., *Tamarisk chinensis*), and burning of willow and grape thickets (USDA 2001a).

The yellow-breasted chat breeds from early May into early August with peak activity in June. Suitable breeding habitat includes second growth, shrubby old pastures, thickets, fencerows, and other riparian vegetation. Nests are usually about 2 to 8 feet above ground in dense shrubs along a stream or river. The clutch size averages three to four eggs and incubation lasts 11 to 15 days. Fledging occurs in 8 to 11 days. Chats frequent dense, brushy thickets near water, and thick understory in riparian woodland. They feed primarily on insects and spiders, but will also eat berries and other fruits.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the yellow-breasted chat in the vicinity of the Project. No specific records were found during this effort. However, marginal habitat exists in lower foothill portions of the Project area and the species may occur in very limited numbers.

Mountain White-Crowned Sparrow (FSV)

The mountain white-crowned sparrow is one of five subspecies of white-crowned sparrow, and the primary one in the Sierra Nevada. This subspecies breeds in higher elevations over much of the western United States and Canada, and migrates south to northern Mexico and Baja California in the winter (Siegel and DeSante 1999). In California, the mountain white-crowned sparrow breeds in higher elevations of the Sierra Nevada, the Cascade Range, the Warner Mountains, Mt. Shasta area, White Mountains, and Mt. San Gorgonio.

Important habitat components for this subspecies include grass, either pure or mixed with other plants, bare ground for foraging, patches of dense shrubs (often willows) or small conifers for nest concealment, standing and/or running water, and tall conifers on the periphery of the breeding territory (USDA 2001a). Nests are usually located on the ground or close to the ground in shrubs or conifers.

The breeding season for mountain white-crowned sparrows extends from mid-May to mid-September. Males usually arrive one week before the females and maintain singing perches from tall conifers surrounding the meadow edges until the meadows are snow free. Egg laying begins in late May to mid-June, and hatching begins in mid-June. Fledging begins in late June. The mountain white-crowned sparrow feeds on seeds and insects, but will also eat buds, grass, and fruits, especially in the winter.

Human activities, primarily logging and forest clearing, have historically opened up suitable breeding habitat for the white-crowned sparrow, as the species is adapted to open and edge habitat conditions and early successional habitat, primarily fields and meadows. Despite creation of new breeding habitat, the species has suffered a significant and sustained decline in large portions of its range. Breeding Bird Surveys show apparent declines of 15.2 percent in the Sierra Nevada. The primary factors in this decline are believed to be degradation and loss of meadows due to grazing, recreation, fire and fuels activities, logging, dams and other water diversions, mining, and road maintenance and construction.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the mountain-white crowned sparrow in the vicinity of the Project. No specific records were found during this effort. However, suitable habitat exists throughout higher elevations of the Project area and the species is expected to occur.

Tricolored Blackbird (FSC, CSC, MNBMC - nesting colonies)

More than 99 percent of the tricolored blackbird population occurs in California, where its range is restricted to the Central Valley and surrounding foothills, and the coastal and inland localities of southern California (USDA 2001a). Local breeding occurs west of the Cascade Range, Sierra Nevada, and southeastern deserts. In central California, breeding occurs east into the foothills of the Sierra Nevada. On the west slope of the Sierra Nevada, the tricolored blackbird is not known to nest above 1,000 feet elevation (USDA 2001a). A few small breeding colonies occur in marshy areas of low foothills of the Sierra Nevada, where they remain all year (Beedy and Hamilton 1999).

The species has declined dramatically in California, with an estimated 37 percent decline between 1994 and 1997. The primary factors in this decline are believed to be loss of nesting and foraging habitat throughout its range in the Central Valley and southern California. Breeding habitat is negatively affected by crop-harvesting and land conversions from rangeland to vineyards, orchards, and urban development (Beedy and Hamilton 1999). Other key factors include pesticides, recreational disturbance, and predation.

The tricolored blackbird is a colony nester, often forming breeding colonies of thousands of birds at a single site. In the winter, they may flock with other blackbird species (Beedy and Hamilton 1999). Breeding birds have been documented traveling as far as four miles from nesting areas to feed. Breeding season usually lasts from mid-April to late July, but active breeding in late fall (October and November) has also been documented (Orians 1960). Breeding habitat consists of nearby water, suitable nesting substrate, and open-range foraging habitat of natural grassland, woodland, or agricultural cropland. Historically, tricolored blackbirds bred almost exclusively in freshwater marshes dominated by cattails or bulrushes. However, in more recent years breeding habitat has shifted to diverse upland and agricultural areas. In 1994, over half of all observed the tricolored blackbird nests were associated with dairies. Other recent findings include some small breeding colonies in California utilizing private and public lakes, reservoirs, and parks that are surrounded by shopping center, subdivisions, and other urban development (Beedy and Hamilton 1999).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the tricolored blackbird in the vicinity of the Project. The CNDDB reports several small colonies from the lower foothills near the westernmost portions of the Project transmission line. Colonies are also known to exist in Folsom, near the terminous of the line at Folsom Junction (pers. comm., Ted Beedy, Jones & Stokes Consultants, Inc. 2000).

American Goldfinch (MNBMC - nesting)

The American goldfinch is a common resident of lowlands and foothills of cismontane California, and primarily an uncommon transient and winter resident in transmontane California. Although mostly resident within its breeding range, upslope and other local movement has been documented post-breeding. During the fall, they are rare but regular at low elevations in mountains (Grinnell and Miller 1944; McCaskie et al., 1979; Garrett and Dunn 1981). Loss and degradation of habitat and nest parasitism by brown-headed cowbirds have been factors in the decline of the population in California.

The American goldfinch nests near water, most commonly in valley foothill riparian habitat, but also in valley foothill hardwood, valley foothill hardwood-conifer, orchard-vineyard, and cropland habitats. They often forage in nearby herbaceous and chaparral habitats. The goldfinch is less restricted to riparian deciduous habitats in winter, but usually forage in or near woodland, and they require drinking water nearby. They flock frequently and use treetops and transmission lines for flock assembly and resting (Zeiner et al. 1990).

The American goldfinch in California breed from April into July. Nests are usually built near water about 3 to 6 feet above ground in a willow, cottonwood, or other riparian deciduous tree. The average clutch is five eggs with incubation lasting 10 to 14 days. The altricial young fledge at 11 to 17 days. Parents may feed as far as one-half-mile from the nest. The American goldfinch feeds primarily on seeds, but in spring about half of diet consists of insects such as aphids and caterpillars (Zeiner et al. 1990). Buds of trees are also important foods, especially in late winter and spring (Grinnell and Miller 1944). They require herbaceous openings for feeding, especially in breeding season.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any reported occurrences of the American goldfinch in the vicinity of the Project. No specific records were obtained during this search. However, suitable habitat exists throughout the lower elevations of the Project area along the Project transmission line and the species is expected to occur.

5.2.3.4 Special Status Bats

Fringed Myotis (FSC, WBWG, FSV)

The fringed myotis is found in most of western North America (excluding California Central Valley, Colorado Desert, and Mojave Desert), Mexico, and a small portion of southern British Columbia (USDA 2001a). They are found throughout the Sierra Nevada from sea level to about 9,300 feet elevation. The fringed myotis appears to be common locally in preferred habitats of

pinyon-juniper, valley foothill hardwood and hardwood conifer forest, primarily from 4,000 to 7,000 feet (Zeiner et al. 1990). It has been noted to be more abundant around older forests (USDA 2001a). These bats make short local migrations to suitable hibernacula but extensive migrations are unlikely. The maternity group may remain together during migration.

The fringed myotis tends to be a roosting habitat generalist that utilizes many different natural and man-made structures (e.g., buildings, mines, caves, crevices). Adults and sub-adults form separate groups while roosting. Foraging habitat includes streams, lakes, ponds, riparian areas, open stands, and open areas without trees (USDA 2001a). Timbered stands with thick understory vegetation may preclude foraging. These bats feed primarily on beetles, but also take moths, spiders, grasshoppers, crickets, crane flies, and true bugs from the ground or gleaned from foliage. The fringed myotis requires a readily available water supply due to poor urine concentrating ability.

The fringed myotis is relatively tolerant of cold, and hibernation occurs from October to March, depending on weather. Mating occurs in the fall, and large maternity colonies of up to 200 individuals form from late April to September. A single young is born from May to July, and lactating females can be found through August.

Loss and degradation of suitable foraging and roosting habitat are impacting the species. In many areas, chaparral stands are maturing and forming dense contiguous stands that are not easily penetrated by foraging bats. Heavy grazing may also affect prey by reducing grasses and herbaceous vegetation used by prey species for cover and food (USDA 2001a). Although they are a roost generalist, renewed exploration or closure of mines, recreational caving, and reduction of tree roosts can affect these bats. Also, urban expansion and timber harvesting have removed large amounts of foraging habitat for the species.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the fringed myotis in the Project area. No such occurrences were identified through this effort. USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001). However, suitable habitat is present in the study area and the species is expected to occur.

Yuma Myotis (FSC, CSC)

The Yuma myotis ranges along the western quarter of North America from Canada south to Mexico, and east to Idaho and Texas. It is common in California and found throughout the state except in the Mojave and Colorado deserts (CDFG 1995). They occupy a variety of habitats below 11,000 feet, but are generally rare above 8,000 feet. Open forests and woodlands with adjacent water provide suitable habitat. Roosting occurs in buildings, mines, caves, or crevices (Zeiner et al. 1990).

The Yuma myotis may make short seasonal migrations from higher elevations to preferred hibernacula. Large maternity colonies of several thousand individuals are formed in buildings, caves, and bridges. Mating occurs in the fall, and one young is born per female between late

May to mid-June. It has been found roosting in association with other bat species including pallid and Mexican free-tailed bats.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the Yuma myotis in the Project area. No such occurrences were identified through this effort and USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001). However, suitable habitat is present in the study area and the species is expected to occur.

Long-Eared Myotis (FSC, FSV)

The long-eared myotis is distributed across most of western North America (excluding California's Central Valley and hot deserts), western Canada, and Baja California (USDA 2001a). This myotis occupies brush, woodland, and forest habitats up to 9,000 feet. It appears to prefer coniferous woodlands and forests, yet is uncommon over most of its range (Zeiner et al. 1990).

Typical roost sites include exfoliating tree bark, tree cavities, snags, caves, mines, cliff crevices, sink holes, rocky outcrops on the ground (e.g., talus slopes), and occasionally trestles, buildings, stumps, and bridges. They usually roost singly or in small groups of 12 to 30 animals (Zeiner et al., 1990). Caves are generally used as night roosts.

The long-eared myotis is believed to hibernate. Mating likely occurs in the fall with one young born in May to June. Females form small maternal colonies with males and non-reproductive females roosting in small groups nearby. The young are able to fly by early August.

The long-eared myotis is primarily a forage gleaner, feeding on moths, small beetles, spiders, flies, lacewings, and wasps (USDA 2001a). They are also known to feed in flight, off tree trunks, rocks, and from the ground. This species has been known to forage at colder temperatures than many other bats. Foraging occurs along forest edges, over water, and among trees and shrubs, usually less than 40 feet above the ground.

Loss and degradation of suitable foraging and roosting habitat are impacting this species. In many areas, chaparral stands are maturing and forming dense contiguous stands that are not easily penetrated by foraging bats. Heavy grazing may also affect prey by reducing grasses and herbaceous vegetation used by prey species for cover and food (USDA 2001a). Although they are a roost generalist, renewed exploration or closure of mines, recreational caving, and reduction of tree roosts can affect these bats. Also, urban expansion and timber harvesting have removed large amounts of foraging habitat for the species.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of long-eared myotis in the Project area. No such occurrences were identified through this effort and USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001). However, suitable habitat is present in the study area and the species is expected to occur.

Long-Legged Myotis (FSC, WBWG, FSV)

The long-legged myotis is widespread throughout the western United States, western Canada, Central Mexico, and Baja California. It is a common bat in all mountain ranges of California, but generally avoids the Central Valley, hot deserts, and eastern Lassen and Modoc counties (USDA 2001a). They are most common in coniferous woodlands and forests above 4,000 feet elevation, but records exist from sea level to 11,400 feet elevation. It has been reported seasonally in riparian and desert habitats.

The long-legged myotis is thought to make short, local migrations to hibernacula. Some sources indicate that caves and mines are used as hibernacula but few records exist. Roost sites can be found in tree cavities, buildings, rock crevices, and under tree bark. Trees are probably the most important day roost structure, but caves and mines are utilized as night roosts. Maternal colonies can consist of hundreds of bats, and are usually found in hollow trees or under bark, but occasionally in buildings, rock crevices, ground cracks, exfoliating tree bark, snags, or mines. Young may be born from May to August, but most commonly in June and July (USDA 2001a). The species forages over water and open habitats at 10 to 15 feet above ground. They feed primarily on moths and other flying insects. Long-legged myotis also require a readily available water supply.

Loss and degradation of suitable foraging and roosting habitat are impacting this species. Timbered stands that contain thick understory vegetation may preclude foraging, while urban expansion and timber harvest can reduce available tree roosts (USDA 2001a).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the long-legged myotis in the Project area. No such occurrences were identified through this effort and USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001). However, suitable habitat is present in the study area and the species is expected to occur.

Western Small-Footed Myotis (FSC, FSV)

The small-footed myotis ranges from across the western half of the United States and Canada and south into Mexico. It occurs in a variety of habitats, primarily in arid woodland and brushy uplands near water, from sea level to 8,900 feet elevation. It occurs in deserts, chaparral, riparian zones, and coniferous forests throughout the Sierra Nevada.

Roosts occur in caves, talus slopes, buildings, mines, crevices, and occasionally under bridges and exfoliating bark (USDA 2001a). Separate night roosts have been reported in buildings and caves, and more humid night roosts are preferred. They typically roost singly or in small groups. The small-footed myotis hibernates from November to March in groups of 50 or more, but the species has a remarkable tolerance for colder temperatures. It often hibernates in cold drafty sites with temperatures varying from about 49 59°F (USDA 2001a).

Females form small (12 to 20 individuals) maternity colonies in buildings, caves, and mines. Typically one or two young are born from May through June. Young are usually able to fly by mid-August (Zeiner et al. 1990).

The small-footed myotis preys on a variety of small, flying insects including moths, flies, and beetles caught while flying over water and among trees. It also forages close to cliffs, rocks, and bluffs. The species requires more water than most bats and can be found drinking shortly after night emergence. Streams, ponds, springs, and stock tanks are used for drinking.

Loss and degradation of suitable foraging and roosting habitat are impacting the species. Timbered stands that contain thick understory vegetation may preclude foraging, while urban expansion and timber harvest can reduce available foraging habitat (USDA 2001a). Renewed exploration or closure of mines, recreational caving, and management effects on rock cliffs and talus slopes can also affect the small-footed myotis. Public fear of rabies has led to extermination of certain colonies in human developments. Inundation of rock cliffs and talus slopes by reservoir construction may also contribute to decline in the species numbers (USDA 2001a).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the western small-footed myotis in the Project area. No such occurrences were identified through this effort and USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001). However, suitable habitat is present in the study area and the species is expected to occur.

~~Hoary Bat (FSV)~~
The hoary bat is found throughout North America. They are considered common in the prairie states and Pacific Northwest, and are highly associated with forested habitats in the west. It may be found throughout California, but the distribution is patchy in the southeastern deserts (USDA 2001a). The species has been found from sea level up to 13,200 feet elevation in woodlands and forests with medium to large size trees and dense foliage. In California during winter, it is found along the coast and in the southern part of the state. In summer it is found inland and north of the winter range. The hoary bat is believed to be adversely affected by loss of roosting habitat due to timber harvest and urban expansion, and degradation of foraging habitat from encroachment of thick understory vegetation into forests openings.

The hoary bat prefers open habitats or habitat mosaics, with access to trees for cover (USDA 2001a). It migrates, probably over long distances, to hibernation sites. Females tend to precede males during the spring migration from February to May. During migration in southern California, males are found in foothills, deserts, and mountains, while females occupy lowlands and coastal valleys. The hoary bat is often found flying in waves of groups during fall migration, whereas spring migration appears less organized.

Solitary roosts occur in dense tree foliage of medium to large trees, preferably hidden from above and open below. They roost in both conifer and deciduous trees near the ends of branches, and

usually 9 to 40 feet above the ground, and at the edge of clearings. Females with young tend to roost at greater heights. Some unusual roost sites have been located in caves and mines, beneath a rock ledge, in a woodpecker cavity, in a squirrel nest, under driftwood, and on the side of a building. The species hibernates but tolerates a wide range of temperatures and may be active at temperatures down to 32°F.

Two to four young are typically born from May through July, and are capable of flight after 33 days. However, breeding females have not been detected in California (USDA 2001a).

The hoary bat feeds primarily on moths, but also will take beetles, flies, grasshoppers, termites, dragonflies, and wasps (USDA 2001a). These bats require a readily available water supply due to relatively poor urine concentrating capabilities.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the hoary bat in the Project area. No such occurrences were identified through this effort. USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001). However, suitable habitat is present in the study area and the species is expected to occur.

Western Red Bat (FSV)

The western red bat is found from California, Nevada, Utah, western Colorado, western New Mexico, Arizona, Mexico, and Baja California. They occur primarily in forests and woodlands throughout the Sierra Nevada from sea level up through mixed conifer forests, excluding deserts and high elevations (USDA 2001a).

The red bat appears to be highly associated with intact riparian habitat, particularly willows, cottonwoods, and sycamores. Existing data suggests that red bats migrate between summer and winter areas and migrants can be found in unusual habitats and outside their normal range. They tend to migrate in groups from March to May and September to October, but most migrations are believed to be relatively short. Winter habitat includes western lowlands and coastal regions south of San Francisco Bay. During summer, sexes occupy different portions of the range and appear to migrate at different times. The species will hibernate in colder climates, with arousal from hibernation on warm days during the cycle.

The red bat roosts in tree foliage and occasionally in shrubs along edge habitats adjacent to streams, fields, or urban areas (USDA 2001a). Preferred roosts are protected from above, open below to allow free flight from the roost, and located above dark ground cover to minimize solar refection. Roosts are generally from 2 to 40 feet above ground and located on the south or southwest side of a tree. The red bat has also been recorded to rarely use caves, mines, and buildings for roosts. Up to five young are born each year between May and July, and young are capable of flight between three to six weeks of age. Females may move young between roost sites and family groups may roost together. Red bats are typically solitary but may also form maternal groups.

Foraging occurs over grasslands, shrublands, open woodlands and forests, croplands, powerline rights-of-way, highways, and roads. Prey items include moths, crickets, beetles, and cicadas taken from high above the forest canopy to nearly ground level. They have been observed foraging in temperatures down to about 55°F. These bats also require a readily available water supply.

Loss and degradation of suitable foraging and roosting habitat are impacting the species. Woodland and forest stands that contain thick understory vegetation deter foraging. In many areas, chaparral stands are maturing and forming dense contiguous stands that are not easily penetrated by foraging bats. Heavy grazing may also affect prey by reducing grasses and herbaceous vegetation used by prey species for cover and food (USDA 2001a). The red bat is also affected by the reduction of tree roosts due to past timber harvest practices and reduction of hardwoods in riparian areas due to competition by other tree species. Urban expansion, reservoir construction and private harvest of hardwoods and riparian vegetation have removed large amounts of roosting habitat for the species.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the western red bat in the Project area. No such occurrences were identified through this effort. USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001). However, suitable habitat is present in the study area and the species is expected to occur.

Spotted Bat (FSC, CSC, FSV, WBWG)

The spotted bat is considered to be one of the rarest mammals in North America. It ranges from southern British Columbia to Mexico, including the western United States, but appears to have a patchy distribution (USDA 2001a). The species has been recorded in arid deserts and grasslands up through mixed conifer forests. The spotted bat is apparently distributed more widely in California and the Sierra Nevada than previously realized (Pierson and Rainey 1998). Recent surveys detected the species at numerous new locations as high as 9,600 feet elevation, extending from Siskiyou County southward to Tulare and Inyo counties. Most new locations have been in mixed oak/conifer habitat, particularly with black oak, ponderosa pine, and incense cedar. Observed sites at higher elevations were associated with coniferous forests dominated by giant sequoia and red fir, or lodgepole pine and white fir. A few observations have been made at lower elevation oak savannas.

The spotted bat appears to be solitary, although they have been recorded hibernating in small groups. There appears to be elevational sexual segregation, with females at higher elevations than males. These bats forage high off the ground and are not easily captured in nets. They also roost solitarily high in cliffs and, therefore, are not recorded very often. The most significant habitat requirement appears to be the availability of roosting habitat in rock crevices of natural cliffs, but they have been recorded in caves and buildings. In California, the bats have not been recorded more than 6.5 miles from a significant rock outcroppings.

Foraging occurs in flight and primarily over water, meadows, forest openings, streams, or old fields, generally in close proximity to trees (Pierson and Rainey 1998). Moths are the preferred prey, but beetles have also been taken. They have been noted to drink water, but have a high ability to concentrate urine unlike most other bat species.

The spotted bat tends to have more restrictive roosting and foraging requirements than other bats. Threats to foraging habitat of the species have been noted from heavy livestock grazing of meadows, encroachment of thick understory in previously open habitats, inundation by reservoirs, and a reduction in habitat mosaic characteristics. Threats to roosting habitat have been noted from management affecting rock outcroppings and cliffs (e.g., reservoir impoundments, road construction) and recreational rock climbing (USDA 2001a).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the spotted bat in the Project area. No such occurrences were identified through this effort and USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001). However, suitable habitat is present in the study area, particularly in the granite cliff formations near Desolation Wilderness, and the species is expected to occur in small numbers.

Silver-Haired Bat (FSV)

The silver-haired bat is found throughout most of the United States, and is primarily associated with forests. During summer and fall migrations, and in winter, the species occurs throughout California. In California, summer distribution includes coastal and montane forests, valley foothill woodlands, pinyon-juniper woodlands, and valley foothill and montane riparian habitat from northern California south to Stanislaus and Monterey counties, generally below 9,000 feet elevation (USDA 2001a). Some sexual segregation may occur with females occurring further to the north.

The silver-haired bat makes long migratory flights to hibernation sites. Migration routes often result in occurrences outside their normal range. Summer and winter roosts occur predominantly in hollow trees, snags, buildings, rock crevices, caves, mines, and under bark. Most roosts are located more than 50 feet above ground. Both males and females change roosts frequently throughout the summer, indicating that clusters of roost sites are necessary. Surveys indicate that these bats are absent when the density of snags falls below two per acre.

Maternity colonies may be formed by the species, but females may also roost solitarily in dense foliage or hollow trees. One or two young are born May through July. Nursery colonies of up to 70 individuals have been recorded, almost exclusively in hollow trees and snags or under loose bark of large diameter snags. Nursery colonies have also been found in buildings.

The silver-haired bat forages mainly on moths and other soft-bodied insects, but will also eat beetles. It captures prey within 20 feet over streams, ponds, open brushy areas, forests, open meadows, and riparian zones. They require a readily available water supply due to poor urine concentrating abilities.

Primary threats to the species include loss of roosting habitat due to logging practices, loss of temporary roosts along migration routes, loss of foraging habitat in riparian areas, and reduction of prey base due to broadcast pesticide applications. However, there is no indication that there have been any changes in the range or distribution of the silver-haired bat (USDA 2001a).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the silver-haired bat in the Project area. No such occurrences were identified through this effort and USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001). However, suitable habitat is present in the study area and the species is expected to occur.

Townsend's Big-Eared Bat (FSC, CSC, FSS, WBWG)

Two subspecies of Townsend's big-eared bat occur in California, with *Plecotus townsendii pallescens* being most likely to occur in the central Sierra Nevada (USDA 2001a). This species seems to mainly use caves or cave-surrogates (e.g., mines) and require specific microclimate conditions to roost successfully. They are found in all Sierra Nevada habitats except subalpine and alpine, but typically below 6,000 feet elevation (Zeiner et al. 1990).

The breeding season begins with copulation during the first three weeks of October, with delayed implantation in the spring, after hibernation. The Townsend's big-eared bat is a colonial species that forms maternity colonies of up to several hundred females, which congregate in March and June and give birth to a single pup between May and July. Males are generally solitary during the maternity periods. Many young bats leave the nursery roost after two months, with males leaving before females. They begin to form hibernation roosts in late October and by January the colony size is at its peak. Males usually choose a warmer location than females and are more active during the winter than females as well. In general, these bats prefer to hibernate in cold places, usually near the entrance of a cave (USDA 2001a).

Foraging habitat for the Townsend's big-eared bat is varied. They are found in grasslands, riparian areas, deserts, and old forests, mid-elevation mixed conifer, mixed hardwood-conifer, and active agricultural areas. They emerge late in the day to feed and eat primarily moths, but may take other insects as well. They concentrate their aerial foraging activity along forest edges and over vegetation. A readily available supply of drinking water is also required.

The Townsend's big-eared bat has declined substantially over the last 40 to 60 years. Surveys conducted in California at known historical (prior to 1980) maternity roosts revealed that 24 of 46 sites (52 percent) were abandoned. Nearly 40 percent of these sites had been destroyed or rendered unusable. In addition, a 55 percent reduction in the number of females present in existing populations has been observed. In the Mother Lode region of the central Sierra Nevada, the mean colony size has decreased from more than 200 individuals to less than 50. Graham found no extant colonies in California's limestone caves and speculated that all had been abandoned due to human disturbance. The species is adversely impacted by disturbance of roost sites due to demolition, renewed mining, hazard abatement, recreational caving, and vandalism. However, the species seems to respond readily to protections at roost sites as long as some

individuals remain in the local area. When roost sites that have been abandoned are gated properly to prevent human intrusion, bats often re-occupy the site within a relatively short time period, and gates placed at occupied roosts may result in an increase in population size. Loss of foraging habitat can also occur due to conversion of habitat to vineyards. However, the species seems to be an opportunistic feeder capable of foraging in a variety of open habitats.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the Townsend's big-eared bat in the Project area. No such occurrences were identified through this effort and USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001). However, suitable habitat is present in the study area and the species is expected to occur.

Pallid Bat (FSS, CSC)

The pallid bat is believed to occur throughout California, except in very high elevations of the Sierra Nevada, from Shasta to Kern counties and in the northwest corner of the state (CDFG 1995). It is most common in open, dry habitats with rocky areas for roosting. They are most abundant below 6,000 feet elevation in the arid Sonoran life zones but have been recorded up to 10,000 feet elevation in the Sierra Nevada (USDA 2001a). The pallid bat is not known to truly migrate, but if temperatures are cold enough, they may migrate locally and elevationally to hibernation sites. Activity is infrequent below about 36°F. They are believed to hibernate singly or in small numbers, and are known to be active in winter in the southern portion of its range.

In California, the pallid bat is mainly associated with oak woodlands at lower elevations and may roost in a variety of locations, including caves, crevices, mines, and occasionally buildings. Tree roosting has been documented in large conifer snags, redwood and sequoia hollows, and oak cavities. It has also been found in stone piles and burlap sacks, bridges, mud cliffs, rocks and rubble such as riprap around culverts and talus slopes. Night roosts occur in more open areas, such as porches and buildings. Few hibernation sites are known.

Maternity colonies form in early April and may contain 12 to 100 individuals. Males may roost elsewhere or with the maternity colony. An average of two young are born between April and July, but predominantly in May and June. The young bats are weaned in seven weeks and females and juveniles forage together after weaning.

These bats require free water for drinking. Their primary prey include large, nocturnal, ground-dwelling or low-flying insects, especially Jerusalem crickets, scorpions, and beetles. Foraging has been recorded up to three miles from the day roost site. Pallid bats typically do not feed over water, but will feed over adjacent oak woodlands and have been recorded foraging over agricultural fields.

Loss and degradation of suitable foraging habitat are impacting the species. The reduction of hardwoods, both from manual removal and competition from conifers, reduces foraging habitat. Hardwood and hardwood-conifer stands that contain thick understory vegetation between ground level and eight feet deter foraging flights. In many areas, chaparral stands are maturing and

forming dense contiguous stands that are not easily penetrated by foraging bats. Heavy grazing may also affect prey by reducing grasses and herbaceous vegetation used by prey species for cover and food (USDA 2001a). Although they are a roost generalist, renewed exploration or closure of mines, recreational caving, and the reduction of tree roosts also affects the pallid bat.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the pallid bat in the Project area. No such occurrences were identified through this effort. USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001). However, suitable habitat is present in the study area and the species is expected to occur.

Western Mastiff Bat (FSC, CSC, FSV)

The western mastiff bat occurs over the arid southwest in southern California, extreme southern Utah, Arizona, southern New Mexico, western Texas, and Mexico. In California, this species occurs primarily in the southeastern San Joaquin Valley and in the Coast Ranges from Monterey County through southern California. It has also been recorded over the Sacramento River in Glenn County and in isolated spots in the north central part of the state (USDA 2001a). It is an uncommon bat that inhabits open arid to semi-arid habitats, including conifer forests and deciduous woodlands, coastal scrub, grassland, palm oases, chaparral, desert scrub, and urban areas. Recent surveys have found roosts up to 4,620 feet and foraging over 8,910 feet in elevation. Records exist for Yosemite Valley and elsewhere in the central Sierra Nevada. In general, the distribution of the species is not well known, but new sightings in northern California are expanding its previously recorded range. They will migrate and forage over river systems.

The western mastiff bat roosts mainly in crevices in vertical cliffs, usually granite or consolidated sandstone, and in broken terrain with rock faces. Roosts have also been found in high buildings, trees, and tunnels. This bat typically requires a vertical drop of at least 9.9 feet for initiating flight but has been known to take off from the ground. They generally roost solitarily or in small colonies of less than 100 bats. Roost sites may change from season to season and both sexes roost together throughout the year. The mastiff bat is active yearlong, limited only when temperatures drop below 41° F.

Maternity roosts are found in tight rock crevices at least 35 inches deep and 2 inches wide. Mating takes place in the spring, and one pup is born during the summer, usually by early July. These maternity roosts can consist of colonies of 30 to several hundred bats, but most have fewer than 100.

Foraging typically occurs in broad, open areas including dry desert washes, flood plains, chaparral, oak woodlands, open ponderosa pine forest, grassland, montane meadows, and agricultural areas. Foraging may occur up to 15 miles from a roost site. Their diet consists mainly of hymenoptera (i.e., bees, wasps) and moths, but also includes crickets and katydids. It forages from ground level up to about 195 feet, depending on terrain, and for up to six or seven hours a night. Because of this, they rarely use night roosts, as do other bats.

There is no indication that there have been changes in the western mastiff bat's historic range or distribution. However, population declines have been noted in California. The mastiff bat appears to be more prevalent within open areas and hardwood and hardwood-conifer stands that that contain thick understory vegetation between ground level and eight feet prevent deter foraging flights. Heavy grazing may also affect prey by reducing grasses and herbaceous vegetation used by prey species for cover and food (USDA 2001a). Disturbances to roost sites from management affecting rock outcrops or cliffs (e.g., road construction, water impoundments) and recreational rock climbing may reduce roost site use.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the western mastiff bat in the Project area. No such occurrences were identified through this effort. USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific Ranger District Biologist, March 2001). However, suitable habitat is present in the study area and the species is expected to occur.

Brazilian Free-Tailed Bat (WBWG)

The Brazilian free-tailed bat is found throughout much of California, but is mostly absent from the high elevations of the Sierra Nevada (from Tehama to Tulare counties) and the north coastal region (from Del Norte and Siskiyou counties to northern Sonoma County). These bats are considered common in California and may be locally abundant (Zeiner et al. 1990). The largest California colony (100,000+ animals) is in Lava Beds National Monument. The species uses all habitats up through mixed conifer forests, but open habitats such as woodlands, shrublands, and grasslands are preferred. This species preys on small insects, primarily moths, and usually over 100 feet above the ground. Drastic declines have been reported for several colonies in the southwestern United States. Pesticides have been suggested as an important cause of these declines (Zeiner et al. 1990), but disturbance of roosts is also a significant factor.

Roost and hibernation sites include caves, crevices, buildings, and mine tunnels. Along the coast, they apparently use buildings predominantly. They may use a separate night roost, particularly if foraging far from the day roost. Individuals move within caves to find suitable temperature. In California, these bats may make local and altitudinal movements to and from hibernacula.

Maternity colonies of females and young are found in caves, crevices, and buildings. Copulation occurs from February through March, and the gestation period is about 100 days. Births occur in June and July, peaking in early July. A few cases of twins are reported, but the usual litter size is one pup. The young nurse in July and August, fly at five weeks, and reach full size in two months. Females in a maternity colony may nurse any solicitous young. Pre-weaning mortality is very low (less than 2 percent).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the Brazilian free-tailed bat in the Project area. No such occurrences were identified through this effort and USFS biologists are not aware of any focused bat surveys in the ENF (pers. comm., Don Yasuda, USFS Pacific

Ranger District Biologist, March 2001). However, suitable habitat is present in the study area and the species is expected to occur.

5.2.3.5 Special Status Mammals

Sierra Nevada Snowshoe Hare (FSC, CSC, FSS, HA)
The snowshoe hare is the most widespread of all New World hares. In the Sierra Nevada, snowshoe hare range along the mid-elevations from the vicinity of Mt. Lassen southward to Mono and Tulare counties. They occupy elevations above 4,000 feet in the north of their range and above 5,000 feet in the south. Upper elevational limits are unknown, but these hares generally occur below 8,000 feet. They are believed to occur on all Sierra Nevada national forests except the Sequoia National Forest (USDA 2001a).

In California, the snowshoe hare is found primarily in montane riparian habitats with thickets of alders and willow, and in stands of young conifers interspersed with chaparral. Habitats used by the species include early seral stages of mixed conifer, subalpine conifer, red fir, Jeffrey pine, lodgepole pine, and aspen. In the Sierra Nevada, they live only in high elevation boreal zones. Food eaten by the snowshoe hare changes from grasses, sedges, dandelions, and various herbaceous plants in the summer, to birch, spruce, willow, tamarack, and pine in the winter.

The breeding season for the snowshoe hare is primarily controlled by day length, but the effect of weather and phase of the population cycle can alter the date of the first litter by three weeks. Total offspring per year per female ranges from 5.7 to 17.8 young. Young hares leave the birth site within a few days and scatter into the surrounding undergrowth and become independent at about two weeks of age.

There is no evidence of a population decline in the species, but it is vulnerable to widespread alterations due to some logging activities and use of meadows for agriculture, grazing, and other activities. Furthermore, the snowshoe hare is a legally hunted game species in California.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the Sierra Nevada snowshoe hare in the Project area. No such occurrences were identified through this effort. However, suitable habitat is widespread in the Project area and the species is expected to occur.

Sierra Nevada Mountain Beaver (FSC, CSC)
Little research has been done on the mountain beaver in general. The subspecies *Aplodontia rufa californicus* is widespread, albeit in small isolated populations throughout the Sierra Nevada. Historical records suggest that this is a long-standing condition, as the Sierra Nevada offers only marginal habitat conditions (USDA 2001a). Primary threats to the species are believed to be cattle grazing, which destroys burrow systems, recreation, water diversions, urban development, and feral pets.

The mountain beaver is seldom seen, being most often identified by extensive underground burrow systems that have numerous openings to the outside. Burrows are usually in moderately

firm soil where digging is easy, but they have been known to dig in other soil types, even sticky clay. Tunnels generally run within one foot of the surface, but sometimes descend to depths of 3 to 5 feet. Studies suggest that the most important factors in habitat use are a cool thermal regime, adequate soil drainage, abundant food supply, a high percent cover of small diameter woody material, and soft soil (USDA 2001a).

The mountain beaver breeds from December through March, with a peak in February. The young are born February to June, with a peak in March through May. They have one litter of two to three young per year after a gestation period of 28 to 30 days. The species is strictly herbivorous and they are known to eat a wide range of plant species, including just about any species within reach of a burrow. Herbaceous plants are eaten whole while woody plants are discarded after the bark has been peeled off for food. Clipped vegetation can often be found near burrow systems.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the Sierra Nevada mountain beaver in the Project area. The ENF has at least one documented sighting of a mountain beaver from July 10, 1993 on the southern edge of Union Valley Reservoir (T. 12 N., R. 14 E., Section 27) (ENF 1999). No other records were available as this IIP was being prepared. However, suitable habitat for the species occurs in a variety of locations in the Project.

Lodgepole Chipmunk (FSC)

The lodgepole chipmunk is abundant in coniferous forests throughout the Sierra Nevada from Lassen County to Tulare County, and from 6,000 to 10,350 feet elevation. It is most common in forests with open to intermediate canopy cover, especially in lodgepole pine but also in Jeffrey pine, mixed conifer, and red fir. Riparian, aspen woodlands, and montane shrub habitats are also used. The species requires logs, stumps, snags, rocks, dead wood, or other ground cover for nesting and shelter.

The lodgepole chipmunk breeds from May to July, with a peak of births in June. The average litter size is five and the gestation period is about one month. They feed on flowers, seeds of shrubs and conifers, fungi, and insects. Food is cached for use in winter, and the species typically hibernates from October or November to March or April. The species is more arboreal than other western chipmunks and is seldom found far from trees.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the lodgepole chipmunk in the Project area. No such occurrences were identified through this effort, although suitable habitat is present and the species is expected to occur.

Sierra Nevada Red Fox (FSC, CT, FSS)

Little is known about the current distribution and status of California's only native red fox. It is largely nocturnal and seldom seen. Most sightings over the last 40 years have been brief glimpses by inexperienced observers. The majority of the sightings have come from Lassen and Yosemite National Parks, where their habitat is protected and the number of potential observers

is high. Its preferred habitat is thought to be openings and meadows in red fir and lodgepole pine forests in the subalpine and alpine zones of the Sierra Nevada.

Historically, the Sierra Nevada red fox was distributed continuously at high elevations in the Sierra Nevada from Sierra County south to Tulare County. This species also occurred in the vicinity of Mt. Shasta and Lassen Peak westward to the Trinity Mountains (USDA 2001a). Although they seem to range from 4,000 12,000 feet elevation, they are seldom sighted below 5,000 feet, and most often above 7,000 feet. Low prey availability and competition for this limited prey resource might be important factors that limit population densities. It is likely that this species was never common. However, there is some question as to whether the Sierra Nevada red fox is rare or just rarely seen. It is likely, however, that populations declined as a result of trapping, grazing, poisoning, and human activity in the early 1900s. Trapping for this species was banned in 1974. The primary current threats are logging, grazing, summer home development, and recreation.

The Sierra Nevada red fox hunts mostly small and medium-sized mammals such as ground squirrels, gophers, mice, marmots, woodrats, pikas, and rabbits. Dense vegetation, hollow logs, burrows, and rocky crevices are used for cover and den sites. Mating takes place during late winter (January to March), and the young are born in early spring (March to May), after a gestation period of about 52 days. Pups are dependent on their parents for six months, and become sexually mature at 10 months. Red foxes typically move downslope in winter into ponderosa pine and mixed conifer, moving upslope in summer to lodgepole pine, subalpine conifer, and red fir habitats.

Upon a detection (photograph, track plate, or sighting verified by a wildlife biologist) of a Sierra Nevada red fox, the ENF is directed by the Sierra Nevada Forest Plan Amendment (USDA 2001a) to conduct an analysis to determine if activities within five miles of the detection have a potential to adversely affect the species. For a two-year period following the detection, the ENF is directed to restrict activities that are determined to have an adverse impact from January 1 to June 30.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the Sierra Nevada red fox in the Project area. No such occurrences were identified through this effort. However, suitable habitat exists at higher elevations of the study area and the species may occur in very low numbers.

Black Bear (MIS, HA)

The black bear is widespread and relatively common throughout the Sierra Nevada, from foothill habitats to alpine zones. They generally occur in fairly dense, mature stands of many forest habitats, valley foothill riparian habitat, and wet meadow. The black bear is a legally hunted species in California with an estimated 2,277 animals taken in 1999.

The black bear is omnivorous. They feed largely on grasses and forbs, fruits, nuts, insects, and carrion. They also consume human garbage when available and can be a pest in many

campgrounds and mountain residential areas. The black bear is seasonal specialists, feeding mainly on grasses and forbs in early spring, insects and fruits (e.g., manzanita berries) in summer, and on acorns and other nuts and fruits in fall. They will forage on the ground, and as high as they can reach in shrubs and trees. They are also known to fish, dig, climb trees for food, graze, and pull branches of trees and shrubs with their forelimbs.

The black bear generally requires large trees and suitable den sites in the form of tree and snag hollows, stumps, logs, caves in talus slopes, or holes in the ground. These habitat elements must be in mature, dense vegetation, and on sheltered slopes for adequate denning. Estrus in black bears occurs in mid-June to mid-July. The gestation period is about 220 days and most young are born in winter dens from late January to early February. The cubs nurse for at least six months and usually stay with the mother for about 1.5 years.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify known occurrences of the black bear in the Project area. The ENF provided a record of a black bear from at least one location on the north shore of Ice House Reservoir (ENF 1999). No other specific occurrences were identified at the time this IIP was being prepared.. However, suitable habitat occurs throughout most of the Project area and bears are known to be common and increasing in number throughout the area.

Ringtail (FP)

The ringtail is widely distributed throughout most of California. They are found in dense riparian growth, montane evergreen forests, oak woodlands, pinyon-juniper, chaparral, and deserts (CDFG 1995). Their territory is usually within one-half mile from a permanent water source. Hollow trees, logs, snags, caves, rocks, and burrows provide reproductive and resting cover. They mate in March and April, and young are born in May and June after a gestation period of 40 to 50 days. Rodents are the primary prey but ringtail will also feed on birds, reptiles, insects and fruit. The ringtail is almost exclusively nocturnal.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the ringtail in the Project area. No such occurrences were identified through this effort. However, suitable habitat occurs throughout most of the Project area and the species is expected to occur.

California Wolverine (FSC, CT, FSS, FP)

The persistence of California wolverine in the Sierra Nevada is a topic of debate among scientists. Reports of sightings continue to be filed by mostly inexperienced observers, but none have been documented by photograph, track, or carcass. This is in spite of an intensive, multi-year cooperative research effort throughout suitable habitat in the central Sierras that employed

Trailmaster camera bait stations; a technique that has been successful in other states with wolverine populations (Copeland and Kucera 1997).

The wolverine was part of the early fur harvest in California and were distributed at low densities throughout most of the Sierra Nevada (Grinnell et al. 1937). In the early 1900s, their populations

declined largely due to trapping (Dixon 1925; Seton 1929). By 1933, no more than 30 individuals were thought to occur in California (Grinnell et al. 1937). They occupied alpine, boreal, and mixed forest vegetation types (Grinnell et al. 1937; Schempf and White 1977). Although they use coniferous forest types predominantly, their significant use of non-forest alpine habitats distinguishes them from the fisher and marten (Banci 1994; Copeland 1996). However, some studies suggest that the wolverine avoids many large forest openings (Hornocker and Hash 1981), but not all forest openings (Copeland 1996). Because forests provide important cover for the wolverine, the connectivity and distribution of dense forest conditions is assumed to be important, especially in the northern Sierra Nevada (USDA 2001a). This region may be an important linkage between habitat in California and habitat in Oregon and Washington; however, the region lacks the alpine zones that can buffer the wolverine from human activity. Instead, the wolverine must use forested habitat to move north and south, and these areas are managed for timber harvest and have numerous small communities, which subject the wolverine to potential disturbance.

The wolverine requires suitable high-elevation rocky substrates with woodpiles or boulders for natal dens. They also seem to select areas that are free from human disturbance. Breeding typically occurs in the summer, but implantation of blastocysts is delayed until at least December, or as late as March. Most young are born in February or March, grow rapidly, and leave their dens in April or May. Dens are usually dug beneath snow, but caves, rock piles, trees, and downed logs are also used. The wolverine feeds primarily on small mammals and carrion. Prey includes marmots, ground squirrels, gophers, mice, deer, birds, and fish. They may kill large, snowbound prey, but most large animals are eaten as carrion. Berries and insects are also eaten on occasion.

Upon a detection (photograph, track plate, or sighting verified by a wildlife biologist) of a California wolverine, the ENF is directed by the Sierra Nevada Forest Plan Amendment (USDA 2001a) to conduct an analysis to determine if activities within five miles of the detection have a potential to adversely affect the species. For a two-year period following the detection, the ENF is directed to restrict activities that are determined to have an adverse impact from January 1 to June 30.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the wolverine in the Project area. The CNDDB has one recent record from 1994 of a possible wolverine sighting at Island Lake in the Desolation Wilderness Area approximately 10 miles east of Union Valley Reservoir. The ENF provided one record from July 7, 1994 near the north shore of Loon Lake Reservoir (ENF 1999). No other documented records from the vicinity of the Project were identified at the time this IIP was being prepared. Suitable habitat appears to exist in the higher elevations of the

Project area but the absence of verified reports in recent years suggests that the wolverine may be extirpated from the Sierra Nevada, or occur in only extremely low numbers (USDA 2001a).

American Marten (FSS)

In California, the marten was historically distributed throughout the Sierra Nevada, California Cascades, and the Coast range, from the Oregon border southward to Sonoma County. They are currently distributed throughout the Sierra Nevada and Cascades (Buskirk and Ruggiero 1994; Buskirk and Zielinski 1997). The species' core elevation range is from 5,500 to 10,000 feet, and they are most often found in the Sierra Nevada above 7,200 feet. Verified marten detections by track or photo exist for all national forests in the Sierra Nevada. Although the marten is classified as a furbearer in California, there has been no trapping season for the species since 1954. The marten distribution in the Sierra Nevada generally conforms to their known historical distribution (Kucera et al. 1995). A decline in marten population size and range during the early 1900s has been attributed to habitat modifications, with trapping and predator control as contributing factors (Bennett and Sampson 1984). Factors that make martens susceptible to local extirpation include: 1) low reproductive potential; 2) an affinity for overhead cover and avoidance of extensive open areas, especially in winter; and 3) very large home range size. Empirical data on population size of martens in California is generally lacking. The primary current threats to the species are timber harvest, grazing, recreation, fire suppression, and road kill.

The marten prefers coniferous forest habitat with large diameter trees and snags, large down logs, moderate-to-high canopy closure, and an interspersion of riparian areas and meadows. Important habitat attributes are: 1) vegetative diversity, with predominantly mature forest; snags; 2) dispersal cover; and 3) large woody debris (Allen 1987). The marten selects stands with 40 to 60 percent canopy closure for both resting and foraging and tend to avoid stands with less than 30 percent canopy closure (Spencer et al. 1983). They generally avoid habitats that lack overhead cover, presumably because these habitats do not provide protection form avian predators (Allen 1987; Bissonette et al. 1988; Buskirk and Powell 1994; Spencer et al. 1983). Various studies in the Sierra Nevada indicate that the marten has strong preferences for forest-meadow edges, and riparian forests appear to be important foraging habitats (Spencer et al. 1983; Martin 1987).

The marten breeds in the summer and have a gestation period of 220 to 290 days, including delayed implantation. Natal dens are typically found in cavities in large trees, snags, stumps, logs, burrows, caves, rocks, or crevices in rocky areas. Most litters are born in March and April, but some are as late as June. The young stay with the female until fall, and then become solitary. Winter resting sites are typically in decayed wood beneath snow (Spencer 1987). The diet of the marten in the Sierra Nevada changes seasonally but is predominantly microtine rodents, tree squirrels, snowshoe hares and, especially in the summer, ground squirrels (Zielinski et al. 1983; 1997; Martin 1987).

The Sierra Nevada Forest Plan Amendment (USDA 2001a) directs each of the national forests, including the ENF, to establish 100-acre buffers around known marten den sites. These buffers are to consist of the highest quality habitat in a compact arrangement surrounding the den site. These highest quality habitats in descending order of priority are California Wildlife Habitat Relationship types 6, 5D, 5M, 4D, and 4M. Buffers are to be protected from disturbance with a LOP from May 1 through July 31 for all new projects as long as habitat remains suitable or until another Regionally-approved management strategy is implemented.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the marten in the vicinity of the Project. The ENF reports numerous observations of marten from throughout the forest (see Appendix E5-2). Most of these observations are from the southwest corner of the Desolation Wilderness, but observations have also been recorded from near Ice House Road, upper Tells

Creek, and the SFAR below Fresh Pond. Suitable habitat is present throughout mush of the Project area and the species is expected to occur wherever suitable habitat exists.

Pacific Fisher (FSC, CSC, FSS)

The distribution of the Pacific fisher has declined substantially from its historic range (Zielinski et al. 1997). Recent surveys indicate that the fisher is absent from their former range for a distance of about 240 miles in the central and northern Sierra Nevada, from Yosemite National Park northward (Zielinski et al. 1995). An intensive survey effort during the early 1990s surveyed for the fisher at 510 sites, ranging from Del Norte, Humboldt, and Siskiyou counties through the southern Cascades and Sierra Nevada to Kern County (Zielinski et al. 1995). The fisher was detected at least once at 90 of these survey sites; most detections were in the northwest (northern Coast Range and Klamath Mountains) and on the west slope in the southern Sierra Nevada. No verifiable evidence of fishers was collected in the area extending from northeastern Shasta County south to Yosemite National Park, even though 66 track-plate surveys (each with multiple stations) and 184 camera stations were deployed in this area. Detections were common in Sequoia National Forest, but decreased moving northward to Yosemite National Park. In Yosemite, two road-killed fishers were collected in 1993 and 1994. After several years of effort, fishers were also photographed in Yosemite at two camera stations.

The fisher is among the most habitat-specific mammals in North America. However, forest type is probably not as important to the fisher as the vegetative and structural aspects that lead to abundant prey populations and reduce fisher vulnerability to predation (Powell 1993). In general, the fisher uses forest or woodland landscape mosaics that include conifer-dominated stands, and they avoid entering open areas that have no overstory or shrub cover (Buskirk and Powell 1994). Riparian corridors (Heinemeyer and Jones 1994) and forested saddles between major drainages (Buck 1983) may provide important dispersal habitat or landscape linkages.

The fisher rests in hollow logs, tree cavities, rocks, snags, ground burrows, fallen trees, canopy of live trees (often in witches broom), and slash piles (Heinemeyer and Jones 1994). However, in California, trees are the most commonly used rest sites. Natal dens, where kits are born, are most commonly in tree cavities at heights of greater than 20 feet, while maternal dens, where kits are raised, may be in cavities closer to the ground so active kits can avoid injury in the event of a fall. The fisher is considered opportunistic predators and are known to feed on rabbits, porcupines, squirrels, grouse, insects, berries, and truffles.

The Sierra Nevada Forest Plan Amendment (USDA 2001a) directs each of the national forests, including the ENF, to establish 700-acre buffers around known fisher den sites. These buffers are to consist of the highest quality habitat (CWHR size class 4 or greater and canopy cover greater than 60 percent) in a compact arrangement surrounding verified the fisher birthing and kit

rearing dens in the largest, most contiguous blocks available. The fisher den site buffers are to be protected from disturbance with a LOP from March 1 through June 30 for all new projects as long as habitat remains suitable or until another Regionally-approved management strategy is implemented. The LOP may be waived for individual projects of limited scope and duration, when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering the intensity, duration, timing, and specific location of the project activity.

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any known occurrences of the fisher in the vicinity of the Project. No recent records exist for this species and the ENF is within the central Sierra Nevada region where fisher are now considered to be extirpated. However, potential habitat does exist in mid-elevation forest stands in the vicinity of the project.

Mule Deer (HA, MIS)
The mule deer is addressed under the description of harvest species below in Section E5.2.3.6

5.2.3.6 Harvest Species

At least 58 designated harvest species that can be legally taken in California occur can occur in the vicinity of the Project (see Appendix E5-2). These include, but are not limited to: 27 species of waterfowl, six upland game bird, various rodents and other small game mammal species, at least 10 furbearers, and two significant big game species (i.e., black bear, mule deer). Harvest of these species is regulated by the CDFG and is permitted throughout the ENF and private land within the vicinity of the Project. Of these species, mule deer are by far the most important in terms of economic interest and public concern. For this reason, mule deer are addressed in detail below.

Mule Deer (MIS, HA)
Mule deer inhabit roughly 64 million acres in California and in nearly all habitats. Suitable habitat includes four distinctly different elements: fawning, foraging, cover, and winter range (USDA 2001a). CDFG has delineated distinct deer herds throughout California. The deer in the vicinity of the Project are considered to be part of the Pacific Deer Herd, with the exception of those deer in the westernmost portion of the Project. The Pacific Deer Herd Management Plan (Hinz 1981) defines long-standing, albeit in some cases outdated, management goals and objectives for this herd.

The Pacific deer herd encompasses all of the Pacific Ranger District of the ENF, and portions of the herd extend into the Georgetown and Placerville Ranger Districts. The herd occupies approximately 353 square miles of public and private lands within El Dorado County and that portion of Placer County south of the Rubicon River. The majority of deer in the herd are migratory and occur west of the Sierra Nevada crest. The herd is defined by the Rubicon River on the north, the SFAR on the south, and roughly a north-south line above 2,500 feet elevation, paralleling Highway 49 between Placerville and Georgetown.

Based on the deer herd plan, approximately 72 percent of the summer range for this herd was within the ENF in 1981, with the remainder on privately-owned lands. Intermediate range ownership in 1981 was split about equally between the ENF and private interests. About 64 percent of the winter range was on ENF land in 1981.

The winter range lies mainly on south facing slopes between 2,000 and 4,500 feet elevation. Intermediate range generally extends from 4,000 to about 6,000 feet elevation, and is used primarily during spring and fall migration. Most of this intermediate range consists of east-west parallel ridges used as migration routes, especially Peavine, Poho, and Telephone ridges. The summer range lies mainly above 5,000 feet.

The mule deer in the central Sierra Nevada typically reside on their summer ranges until they are stimulated to move downslope to their wintering areas (Loft et al. 1989). Habitat quality and quantity, temperature, day length and weather conditions all play a part in determining when these deer initiate and complete their fall migrations. Generally, from mid-October, or later, any significant winter storm has the potential to cause some migratory deer to move from summer range to lower elevations. If those storms are mild, some deer may delay in intermediate habitat, seeking acorns, leaf mast and other available fall forage. If severe enough, a single storm may result in the migration of a large percentage of the animals from the higher elevations downslope to winter range habitat. In contrast, spring migration usually occurs as a gradual upward drift that may span two months as deer delay in holding areas where cover and forage are abundant (Loft et al. 1989).

A variety of factors have resulted in long-term declines in the Pacific deer herd, including: 1) direct loss of habitat by construction of homesites, reservoirs, roads, etc.; 2) grazing by livestock (Loft et al., 1991); 3) extensive logging; 4) fire suppression; 5) recreation; 6) both legal and illegal kill; 7) predation (especially by mountain lions); and 8) diseases and parasites (USDA 2001a). Direct loss of habitat through home construction and urban expansion has had the greatest effect on winter range. At high elevations, construction of Union Valley, Wrights Lake (non-Project), Loon Lake, Ice House, and Gerle Creek reservoirs was estimated to have eliminated 8.1 square miles of fawning habitat (Hinz, 1981). However, this acreage may over-estimate the amount and quality of meadow fawning habitat that existed in areas now inundated by these reservoirs. Aerial photos held by the ENF that depict the pre-inundation condition at Project reservoirs do not appear to support the meadow acreage estimates provided in the Pacific deer herd plan, based solely on a simple visual inspection, but no quantitative information is available.

Open-water conveyances, such as the 9,987-foot Gerle Canal, have the potential to adversely affect deer through entrapment and drowning depending on design and location, relative to deer movements. However, Gerle Canal has limited potential to entrap deer because it has three bridge crossings, low-velocity areas, and mostly unlined, gently-sloped sides (FERC 1998). Similarly, above ground penstocks (steel pipe) also have the potential to adversely affect deer, depending on the design and location of the conduit, by altering deer movement patterns. The Project has approximately 3 miles of aboveground penstock as follows: 1) Robbs Peak Powerhouse Penstock - 2,235 feet; 2) Jones Fork Powerhouse Penstock - 8,190 feet; 3) Jaybird

Powerhouse Penstock - 2,620 feet; 4) Camino Powerhouse Penstock - 1,110 feet; and 5) White Rock Penstock - 1,675 feet. Of these, the Jones Fork Penstock was identified prior to its construction as a potential impediment to deer migration (EA 1980). As a result, the penstock was constructed on pedestals to allow for animals to cross beneath the pipe (FERC 1998). On other Project penstocks, SMUD has excavated soil beneath the pipe at various locations to allow for opportunistic passage of deer and other wildlife (pers. comm, Lonn Maier, SMUD, April 2001).

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify specific information on mule deer and their significant habitats in the vicinity of the Project. The ENF provided the location of delineated critical winter, summer, and intermediate range, as well as critical fawning habitat and holding areas (see Appendix E5-2). Designated critical fawning habitat, holding areas, and critical summer range occur on the north side of Loon Lake Reservoir, and to the north and east of Union Valley and Ice House reservoirs. Critical winter range occurs along the north side of the SFAR from just above White Hall to the western boundary of the ENF.

5.3 Wildlife in the Project Area

The available literature and resource databases have been reviewed and resource agency personnel have been consulted to identify any formal investigations of terrestrial wildlife resources that have been performed to date in the vicinity of Project facilities and features. No formal research projects were identified from this effort. However, the ENF conducts regular monitoring of the distribution and abundance for several special status wildlife species. These ENF surveys are focused primarily on northern goshawk, bald eagle, peregrine falcon, California spotted owl, American marten, and Pacific fisher. Incidental observations are also recorded for verified sightings of other species of interest to the ENF. Records obtained from the ENF periodic surveys and incidental observations were discussed previously in Sections E5.2.3.3 (special status birds), E5.2.3.4 (special status bats), E5.2.3.5 (special status mammals), and E5.2.3.6 (harvest species). In addition, species occurrence records and the location of established PACs (e.g., PACs for spotted owl and northern goshawk) are presented graphically in Appendix E5-2 for the following wildlife: Bald Eagle Habitat; Northern Goshawk PACs; California Spotted Owl PACs; Willow Flycatcher and Great Gray Owl Potential Habitat; Furbearer Observations; and Deer Herd Critical Areas. Finally, site specific descriptions of the plant communities that provide habitat for wildlife around each project feature are presented in Section E4.0, Botanical Resources.

In addition to surveys conducted by the ENF, various individuals, organizations, and agencies conduct surveys of breeding birds annually throughout North America, including portions of the Project area, in support of the annual BBS coordinated by the Patuxent Wildlife Research Center. Similarly, volunteers convene each winter to count birds in support of the Christmas Bird Count sponsored by the Audubon Society and Cornell Laboratory of Ornithology. Records obtained from these two surveys provide indices in regional trends of bird species across the continent. However, these surveys do not provide specific information on the location of bird sightings relative to features and facilities of the Project.

SMUD is not aware of any other formal investigations of terrestrial wildlife in the vicinity of the Project.

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