

Report E3
FISH, WILDLIFE, AND BOTANICAL RESOURCES

Section E3.2
WILDLIFE RESOURCES

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FISH, WILDLIFE, AND BOTANICAL RESOURCES

Section E3.2

WILDLIFE RESOURCES

E3.2 Wildlife Resources

E3.2.1 Introduction

The immediate vicinity of the project supports a diversity of habitats and associated wildlife species and ranges in elevation from slightly below 3,000 feet at Belden to approximately 4,600 feet at Canyon Dam.

The principal wildlife habitat types found in the immediate vicinity of the project are presented in Table E3.2-1. These habitats are based on the classification system developed by the California Interagency Wildlife Task Group, known as the Wildlife Habitat Relationships Program (CWHR 1988). Also presented in Table E3.2-1 is the corresponding vegetation community name (Sawyer and Keeler-Wolf 1995) associated with each of these CWHR habitat types. Detailed floristic descriptions of each type can be found in Section 3.3 Botanical Resources.

The Plumas National Forest (PNF) Land and Resource Management Plan (LRMP) was prepared in 1988, and identifies discrete geographical areas within the forest where management efforts are to be prioritized on behalf of certain species or habitats (USFS 1988). Butt Valley Powerhouse, Butt Valley Reservoir, the project's jurisdictional

transmission line (Butt Valley - Caribou 115 kV), Caribou No. 1 and No. 2 powerhouses, and all other project features between Canyon Dam and Belden Powerhouse are contained within the Butt Lake Management Area (#26) as described on pages 4-271 through 4-273 of the LRMP. The LRMP also contains forest-wide Standards and Guidelines for conservation of forest wildlife species and habitats.

Table E3.2-1 Wildlife Habitat Types and Their Equivalent Vegetation Community Types, Upper NFFR Project

CWHR HABITAT TYPE¹	VEGETATION COMMUNITY TYPE²
Montane Hardwood	Canyon Live Oak Series
Sierran Mixed Conifer	Mixed Conifer Series
Lodgepole Pine	Lodgepole Pine Series
Montane Riparian	White Alder Series
Mixed Chaparral	Leather Oak Series
Montane Chaparral	Green-leaf Manzanita Series
Fresh Emergent Wetland	Fresh-water Marsh Habitats
Wet Meadow	Wet Montane Meadow
Perennial Grassland	Dry Montane Meadow

Black-tailed deer (*Odocoileus hemionus columbianus*) and California mule deer (*O. h. californicus*) are the most abundant big game species in the PNF (USFS 1988). According to historical data, the maximum population that the forest could support is

¹ Based on the classification system of the California Wildlife Habitat Relationships Program (CWHR 1988)

² Based on the classification presented by Sawyer and Keeler-Wolf (1995)

157,000 deer. However, the PNF owns mostly summer range; therefore, a population of 22,000 deer is being used as a management target. The overall forest population in 1982 was 19,100. Deer populations have declined in recent years, because of: 1) the low survival rate of fawns, 2) conversion of brush fields to plantations, 3) the use of herbicides, 4) increased road densities, 5) loss of riparian areas, and 6) competition with livestock for forage. The PNF and CDFG have cooperatively prepared deer herd management plans for each herd found in the forest. A portion of the winter range for the Bucks Mountain Herd lies within the lower elevations of the project, between Caribou and Belden. The Bucks Mountain Herd population, which peaked in 1963-67, was estimated at 8,467 (Snowden 1984). The population, in 1985, was estimated at 3,015 deer, which represents a 60% decline over a 20-year period. The Bucks Mountain Management Plan strives to maintain a population of at least 4,000 deer.

The summer range of the East Tehema Deer Herd extends outward a distance of 3 to 5 miles from the shorelines of Lake Almanor and Butt Valley Reservoir. This large, migratory population of California mule deer winters at lower elevations outside the project vicinity in Butte and Tehema counties. Traditional migration routes occur in the immediate project vicinity to the north and south of Lake Almanor. These routes cross state highways 36 and 89. Deer from the East Tehema herd begin arriving in the project area during the month of May. The summer residency period may last well into October. Many deer spend the entire summer in the immediate vicinity of Lake Almanor.

The project reservoirs, streams and wetland areas provide habitat for a variety of water-dependent species, such as the Canada goose, other waterfowl, and shorebirds (see Table E3.2-2). These project features also provide habitat for picivorous (fish eating) birds like the osprey, double-crested cormorant, and the bald eagle.

Montane hardwood and montane hardwood-conifer habitats support or potentially support a variety of other important upland game species, such as California quail, mountain quail, blue grouse, mourning dove, ring-necked pheasant, and wild turkey.

3.2.2 Sensitive Wildlife Species

In addition to recreationally and commercially important wildlife species, a variety of state/federal endangered and threatened species and USFS sensitive species have been identified as occurring, or potentially occurring, in the immediate vicinity of the project. One federally listed threatened species, the bald eagle (*Haliaeetus leucocephalus*), is known to occur at several locations in the immediate vicinity of the project. Two other federally listed threatened species, the California red-legged frog (*Rana aurora draytonii*) and valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), could potentially occur within the immediate project vicinity. The American peregrine falcon (*Falco peregrinus anatum*), recently de-listed by the federal government but still listed by the state as endangered and by the USFS as sensitive, is known to nest at one location within the immediate project vicinity between Canyon Dam and Caribou No. 1 and No. 2 powerhouses. Table E3.2-3 summarizes information on federal and state listed species and USFS sensitive species known to occur, or potentially occurring, within the

immediate vicinity of the project. A brief discussion of each species listed in Table E3.2-3 follows. Listed and sensitive amphibian and aquatic reptile species are discussed in Section 3.1.1.3.

E3.2.2.1 Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB) was listed by the USFWS as a threatened species in 1980. Critical Habitat for the VELB was designated along two portions of the American River in Sacramento County and along Putah Creek in Solano and Yolo counties. At the time of its listing, the VELB was known only from the American River in Sacramento County, Putah Creek in Solano and Yolo counties, and the Merced River in Merced County. Subsequent surveys discovered several other areas of VELB occurrence, including: a) additional sites along the American River; b) portions of the Sacramento River between Sacramento and Red Bluff; c) several creeks in the Roseville area and other portions of Placer County; d) various rivers, including the Consumnes, Mokelumne, Calaveras, San Joaquin, Kings, Tuolumne, and Middle River (Kellner 1992); and e) other localities at streams in the Sacramento Valley (Arnold 1990), and in the foothills of Madera County (CDFG 1997).

USFWS recognizes the range of the VELB to extend throughout California's Central Valley and associated foothills from about the 3,000-foot elevation contour on the east to the watershed boundary of the Central Valley on the west.

Table E3.2-2 Recreationally and Commercially Important Wildlife Species Occurring or Potentially Occurring in the Immediate Vicinity of the Upper NFFR Project

Species	Habitat Type¹
AMPHIBIANS	
Bullfrog (<i>Rana catesbeiana</i>)	Lacustrine, fresh emergent wetland
BIRDS	
American coot (<i>Fulica americana</i>)	Annual grassland, fresh emergent wetland
American crow (<i>Corvus brachyrhynchos</i>)	Montane hardwood, annual grassland
American widgeon (<i>Anas americana</i>)	Fresh emergent wetland, riverine
Band-tailed pigeon (<i>Columba fasciata</i>)	Montane hardwood conifer
Barrow's goldeneye (<i>Bucephala islandica</i>)	Fresh emergent wetland, riverine
Blue grouse (<i>Dendragapus obscurus</i>)	Annual grassland, montane hardwood-conifer
Blue-winged teal (<i>Anas discors</i>)	Fresh emergent wetland, lacustrine
Brant (<i>Branta bernicia</i>)	Annual grassland, fresh emergent wetland
Bufflehead (<i>Bucephala albeola</i>)	Fresh emergent wetland, lacustrine
California quail (<i>Callipepla californica</i>)	Montane hardwood, montane hardwood conifer
Canada goose (<i>Branta canadensis</i>)	Riverine, fresh emergent wetland, perennial grassland
Canvasback (<i>Aythya affinis</i>)	Fresh emergent wetland
Cinnamon teal (<i>Anas cyanoptera</i>)	Fresh emergent wetland, lacustrine
Common goldeneye (<i>Bucephala merganser</i>)	Riverine
Common merganser (<i>Mergus merganser</i>)	Riverine, fresh emergent wetland
Eurasian widgeon (<i>Anas americana</i>)	Fresh emergent wetland, riverine, annual grassland, lacustrine
Gadwall (<i>Anas strepera</i>)	Fresh emergent wetland, lacustrine, riverine
Greater white-fronted goose (<i>Anser albifrons</i>)	Riverine, fresh emergent wetland, annual grassland
Green-winged teal (<i>Anas crecca</i>)	Lacustrine, riverine, fresh emergent wetland
Hooded merganser (<i>Lophodytes cucullatus</i>)	Fresh emergent wetland, riverine
Lesser scaup (<i>Aythya affinis</i>)	Fresh emergent wetland, lacustrine
Mallard (<i>Anas platyrhynchos</i>)	Fresh emergent wetland, riverine, annual grassland
Mountain quail (<i>Oreortyx pictus</i>)	Montane riparian, montane hardwood-conifer, montane hardwood
Mourning dove (<i>Zenaidura macroura</i>)	Montane hardwood-conifer, montane hardwood, annual grassland
Northern pintail (<i>Anas acuta</i>)	Fresh emergent wetland, riverine, lacustrine
Northern shoveler (<i>Anas clypeata</i>)	Fresh emergent wetland, lacustrine, annual grassland
Redhead (<i>Aythya americana</i>)	Fresh emergent wetland, lacustrine
Ring-necked pheasant (<i>Phasianus colchicus</i>)	Fresh emergent wetland, annual grassland, montane hardwood
Ross' goose (<i>Chen rossii</i>)	Riverine, fresh emergent wetland, annual grassland
Ruddy duck (<i>Oxyura jamaicensis</i>)	Fresh emergent wetland, lacustrine

Table E3.2-2 (Continued)

Species	Habitat Type ¹
BIRDS	
Snow goose (<i>Chen caerulescens</i>)	Riverine, fresh emergent wetland, annual grassland
Wild turkey (<i>Melaegris gallopavo</i>)	Montane hardwood-conifer, montane hardwood
Wood duck (<i>Aix sponsa</i>)	Lacustrine, riverine
MAMMALS	
American badger (<i>Taxidea taxus</i>)	Annual grassland, orchard/vineyard
American beaver (<i>Castor canadensis</i>)	Lacustrine, fresh emergent wetland
Black bear (<i>Ursus americanus</i>)	Montane hardwood-conifer, montane hardwood, lacustrine
Black-tailed hare (<i>Lepus californicus</i>)	Annual grassland, orchard/vineyard
Bobcat (<i>Lynx rufus</i>)	Montane hardwood, annual grassland
Brush rabbit (<i>Sylvilagus bachmani</i>)	Annual grasslands, orchard/vineyard
Common muskrat (<i>Ondrata zibethicus</i>)	Fresh emergent wetland, lacustrine
Coyote (<i>Canis latrans</i>)	Annual grasslands, orchard/vineyard
Douglas' squirrel (<i>Tamiasciurus douglasii</i>)	Montane hardwood-conifer
Ermine (<i>Mustela erminea</i>)	Montane hardwood-conifer
Gray fox (<i>Urocyon cinereoargenteus</i>)	Annual grassland, montane hardwood
Long-tailed weasel (<i>Mustela frenata</i>)	Montane hardwood-conifer, annual grassland
Mink (<i>Mustela vison</i>)	Fresh emergent wetland, lacustrine
Mule deer (<i>Odocoileus hemionus</i>)	Montane hardwood, montane hardwood-conifer
Raccoon (<i>Procyon rotor</i>)	Annual grassland, montane hardwood
Snowshoe hare (<i>Lepus americanus</i>)	Montane hardwood
Striped skunk (<i>Mephitis mephitis</i>)	Montane hardwood, annual grassland
Virginia opossum (<i>Didelphis virginiana</i>)	Annual grassland, fresh emergent wetland
Western gray squirrel (<i>Sciurus griseus</i>)	Montane hardwood-conifer
Western spotted skunk (<i>Spilogale gracilis</i>)	Annual grassland, montane hardwood

¹ Optimum habitat occurring within the immediate vicinity of the Upper NFFR Project

The VELB is completely dependent on its host plant, elderberry (*Sambucus* spp.), which is a common component of the remaining riparian forests and adjacent upland habitats of California's Central Valley. Frequently, the only exterior evidence of the plant's use by the beetle is an exit hole created by the larva just prior to pupal stage. The life cycle most likely takes two years to complete. The animal spends most of its life in the larval state, living within the stems of an elderberry plant. Adult emergence is from April through June, about the same time the elderberry produces flowers. The adult state is short-lived.

The Licensee identified one host plant (elderberry) along Caribou Road south of Oak Flat Powerhouse during surveys conducted in 1999. The elevation of the site was just below 3,000 feet. The same survey identified several other plants along a transmission line access road east of the town of Belden (outside project boundaries). In 1998, PG&E performed VELB surveys throughout the Rock Creek-Cresta Project (FERC 1962) and the Rock Creek - Rio Oso transmission line right-of-way. These surveys identified a number of host plants in the vicinity of Camp Creek, north of Pulga (outside project boundaries of FERC 2105). These records from 1998 and 1999 are the only known records of VELB habitat in the project vicinity.

Table E3.2-3. Federal and State Listed, and U.S. Forest Service Sensitive Wildlife Species Known to Occur or Potentially Occurring in the Immediate Vicinity of the Upper NFFR Project

Species	Status ¹	Optimum Habitat
BIRDS		
Bald eagle (<i>Haliaeetus leucocephalus</i>)	SE, FPD	Coniferous forest, lacustrine, riverine
American peregrine falcon (<i>Falco peregrinus anatum</i>)	SE, FS	Montane hardwood-conifer, cliff sites for nesting
Northern goshawk (<i>Accipiter gentilis</i>)	FS	Montane hardwood-conifer
California spotted owl (<i>Strix occidentalis occidentalis</i>)	FS	Montane hardwood-conifer
Willow flycatcher (<i>Empidonax traillii</i>)	FS, SE	Montane riparian, wet meadow
Greater sandhill crane (<i>Grus Canadensis tabida</i>)	ST, FS	Lacustrine, wet meadows
MAMMALS		
California wolverine (<i>Gulo gulo luteus</i>)	ST, FS	Montane hardwood-conifer, montane riparian
Pacific fisher (<i>Martes pennanti pacifica</i>)	FS	Montane hardwood-conifer, montane riparian
Pine marten (<i>Martes americanus</i>)	FS	Montane hardwood-conifer
Sierra Nevada red fox (<i>Vulpes vulpes necator</i>)	ST, FS	Montane hardwood-conifer, montane riparian
Townsend's big-eared bat (<i>Plecotus townsendii pallescens</i>)	FS	Montane hardwood-conifer, montane riparian
Pallid bat (<i>Antrozous pallidus</i>)	FS	Montane hardwood-conifer, montane riparian
Western red bat (<i>Lasiurus blossomii</i>)	FS	Montane hardwood-conifer, montane riparian
INSECTS		
Valley elderberry longhorn beetle (<i>Desmocerus californicus dimorphus</i>)	FT	Riparian, upland hardwood savannah

¹ The status of listed species includes:

- SE = Listed as *Endangered*, by the State of California
- ST = Listed as *Threatened*, by the State of California
- FE = Federally listed as *Endangered*
- FT = Federally listed as *Threatened*
- FPD = Federally Proposed for De-listing
- FS = Forest Service, *Sensitive Species*

E3.2.2.2 Bald Eagle

In 1995, on the basis of an increase in populations, USFWS reclassified the bald eagle from endangered to threatened in the lower 48 states. However, the species remained classified as endangered under the laws of the state of California. More recently (July 6, 1999), the bald eagle was proposed for federal de-listing.

Breeding bald eagles require relatively large bodies of water containing standing populations of suitable-sized fish (Buehler 2000). Most fish taken by bald eagles on reservoirs in northern California are carrion; fish mortality is mostly related to spawning and angling stress (Jackman and Hunt 2001). Waterfowl supplement the diet of bald eagles, especially in the winter and early nesting season (Hunt et al. 1992b). Nests are usually located within one mile of key foraging areas; eagles characteristically require large conifers in relatively secluded locations to build nests (Lehman 1979). Bald eagles are resident in northeastern California; they begin nesting (incubating) in late February through March with young fledging by July (Hunt et al. 1992a). The number of breeding pairs of bald eagles in California now exceeds 150 (R. Jurek, 1999, CDFG, unpubl. report), still mostly concentrated in the northern part of the state. The breeding and foraging biology of bald eagles in the Upper NFFR Project area was described for 1986-1987, when management plans for known territories were also completed (Pacific Gas and Electric Company 1988).

Lake Almanor presently supports nine bald eagle nesting territories, about half of which have appeared in the last five years. This increase in breeding bald eagle numbers at Lake Almanor has coincided with increased breeding populations throughout the state. It is assumed that the nesting eagles at Lake Almanor occur there year-round. In addition, non-breeding immature or sub-adult bald eagles are routinely observed around the project, and migrant eagles may also occur there during winter months. At least 86 bald eagles have been counted in the PNF during midwinter eagle surveys (USFS 1988).

Three bald eagle nesting territories occur at Butt Valley Reservoir, two on the west side of the reservoir and one on the east side. The Cool Springs Territory was first reported in 1970. A second territory (Butt Valley Dam I) was discovered in 1975, and a third territory (Butt Valley Dam II) first appeared in 1987. Breeding eagles throughout the project area are primarily fish eaters. A collection of 130 prey remains at nest sites and preferred foraging perches at Butt Valley Reservoir in 1988 revealed that 92% of the biomass of bald eagle prey was fish (PG&E 1988). Moreover, a single species of fish (carp) accounted for 82% of the total prey biomass. Other prey items included brown bullhead (5.4%) and Sacramento sucker (2.9%). Birds were found to account for 7.4% of bald eagle prey biomass.

Recent seismic remediation work at both Lake Almanor and Butt Valley dams resulted in the need to survey and monitor bald eagle nesting territories in the vicinity of these project features (PG&E 1999). Results of these surveys were submitted to FERC and the CDFG. In general, productivity data for project area bald eagle nests exceeds the

statewide productivity average of 1.0 young per year in California. No bald eagle nesting territories are known to occur along the NFFR between Canyon Dam and Belden Powerhouse.

E3.2.2.2.1 Bald Eagle Study Methods

Garcia and Associates' biologists surveyed all known bald eagle nests in the Upper NFFR Project area during the 2001-breeding season to determine status and the eventual outcome of each nesting event. Nests were surveyed from a helicopter, which was flown high (~500 ft.) above the nest to avoid disturbing nesting adults. Each nest was checked three times during the season, as recommended by CDFG (Jurek 1990): early in the season (3 April 2001) to determine occupancy; in mid-nesting season (10 May 2001) to determine the presence of eggs or young; and late in the season (18 June 2001) to determine success and the number of young fledged or near fledging. In addition to the 2001 surveys, data from past bald eagle surveys conducted by Licensee and others (Pacific Gas and Electric Company files; CDFG unpublished data; Jurek 1990) was incorporated to complete the recent historical breeding records for each territory. Nesting activity was classified and described using the following categories, after Jurek (1990):

Occupied: two adults present in a territory during the breeding season.

Occupied, Not Successful: an occupied territory where no eggs were laid or no young were produced (failed) because of egg breakage, egg death, or nestling death.

Unoccupied: only one adult or no adults in a nesting territory.

Active: adult incubating or brooding or nestlings present.

Inactive: no incubation, brooding, or nestlings at an occupied territory.

Failure: nesting attempt failed due to egg breakage, egg death, or nestling death.

Successful: one or more young fledged from the nest.

Mean annual productivity was calculated by dividing the total young produced at a territory by the number of times the territory was occupied over a period of years. Young-per-occupied-site was used to account for nonbreeding periods as recommended by Postupalsky (1974) and to be consistent with other researchers.

E3.2.2.2.2 Bald Eagle Study Results

There are 14 known bald eagle territories in the Upper NFFR Project area and vicinity, including three at Butt Valley Reservoir, nine at Lake Almanor, and two at Mountain Meadows Reservoir (Figure E 3.2-1). Of these, only 12 were confirmed as occupied in 2001. The reproductive history of known territories since 1988 is compiled in Table E 3.2-4. Five new bald eagle territories were discovered in the Upper NFFR Project area since 1995, contributing to the long-term increase of bald eagle populations recorded elsewhere in California and throughout their range in the United States. Overall productivity (1.0 young per occupied territory) and reproductive success (61% of occupied territories successful) in the project area from 1988 to 2001 were at or near the statewide averages (1.0 young/occupied territory, 65% nesting success; Jurek 1990). This occurred despite the known DDT contamination of the Rocky Point female bald eagle (Pacific Gas and Electric Company 1988), a condition that caused this territory to be entirely non-productive until her apparent replacement in 1997.

Table E 3.2-4. Reproduction In 14 Bald Eagle Nesting Territories In The Upper NFFR Project Area, 1988 To 2001.

Nest Territory	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	1988-2001 (yng/occ. yr.)
Butt Valley 1	ONS	NO	1	ONS	ONS	2	1	ONS	2	1	2	ONS	ONS	ONS	(0.7)
Cool Springs	2	ONS	NO	NO	1	2	2	ONS	2	ONS	ONS	ONS	ONS	ONS	(0.8)
Butt Valley 2	2	2	2	1	OSU	2	2	ONS	2	2	1	1	1	2	(1.5)
Rocky Point	ONS	ONS	ONS	SU	ONS	NO	ONS	ONS	ONS	1	2	1	1	2	(0.6)
Switchback										2	ONS	1	2	1	(1.2)
Rock Lake									ONS	1	1	2	1	1	(1.0)
Collins Pine South	SU	OSU	NO	1	2	SU	NO	2	2	2	2	2	ONS	1	(1.6)
Collins Pine North	ONS	ONS	NO	ONS	ONS	OSU	ONS	1	ONS	NO	ONS	2	ONS	NO	(0.3)
Chester (Church)								2	2	2	NO	1	2	1	(1.7)
Mud Creek Rim	SU	1	2	1	ONS	ONS	2	NO	ONS	2	1	1	1	2	(1.1)
Catfish Beach														ONS	(0.0)
Eastside											2	2	2	1	(1.8)
Mountain Meadows West	ONS	ONS	OSU	OSU	ONS	SU	SU	ONS	1	2	1	ONS	ONS	ONS	(0.4)
Mountain Meadows East	2	OSU	SU	NO	NO	SU	SU	NO	NC	ONS	NO	NO	NO	NO	(1.0)
No. of Occupied Territories of Known Outcome	7	6	4	5	7	4	6	8	10	11	11	12	12	12	115
Total Young Produced	6	3	5	3	3	6	7	5	11	15	12	13	10	11	110
Young per Occupied Territory	0.9	0.5	1.3	0.6	0.4	1.5	1.2	0.6	1.1	1.4	1.1	1.1	0.8	0.9	1.0
No. of Successful Territories	3	2	3	3	2	3	4	3	6	9	8	9	7	8	70
% Successful Occupied Territories (of known outcome)	43%	33%	75%	60%	29%	75%	67%	38%	60%	82%	73%	75%	58%	67%	61%

ONS = Occupied, not successful NO = Not occupied OSU = Occupied, success unknown SU = success unknown NC = Not checked

E3.2.2.3 Osprey

The osprey (*Pandion haliaetus*) is not currently listed under either the State or Federal Endangered Species Acts. Neither does Region 5 of the Forest Service list this species as Sensitive. It is currently listed by the State as a California Species of Special Concern (Remsen 1978).

Like bald eagles, ospreys also require relatively large bodies of water (e.g., rivers, lakes, reservoirs) containing standing populations of suitable-sized fish. Ospreys usually arrive in northeastern California in late March or early April to establish nesting territories, and lay eggs in May. Young typically fledge by late July. Osprey nesting populations are concentrated in the northern coastal and mountain regions of California, and their population was estimated at 355 pairs in 1975 (Henny et al. 1978). Populations in northern California are still healthy and may be expanding; however, the osprey has all but vanished from southern California (Remsen 1978).

When nesting, ospreys utilize snags or stag-top conifers and often tolerate a greater human presence near their nests than do bald eagles (Poole 1989). Osprey nests are typically constructed on the tops of snags and are usually very conspicuous (Call 1978).

E3.2.2.3.1 Osprey Study Methods

Osprey nests were located during the 18 June 2001 helicopter survey for bald eagles and during ground and boat searches conducted throughout the Upper NFFR Project area in July 2001. Each site was mapped onto USGS topographic quads and data were recorded

on site occupancy, nesting substrate, and reproductive status, where possible. This work was facilitated by an existing USFS, Lassen National Forest, Almanor Ranger District osprey database (M. Williams, USFS wildlife biologist, unpublished database), which was updated for 2001 following our surveys.

E3.2.2.3.2 Osprey Study Results

All osprey nests in the Upper NFFR Project area occurred around Lake Almanor, including some along the Hamilton Branch just upstream of its confluence with the reservoir and several along the NFFR just downstream of Canyon Dam (Figure E 3.2-2). No ospreys were found nesting on Butt Valley Reservoir, although at least one pair nested there in the mid-1980s (Pacific Gas and Electric Company 1988). A total of 66 active osprey nests were found in the project area in 2001. These included 14 that had apparently moved relatively short distances (up to several hundred meters) from previous locations (based on the USFS database) and 16 previously unrecorded sites. Surveyors were unable to locate 12 recently active sites (presumed gone or moved longer distances) found in the USFS database and were also unable to confirm activity at two occupied sites (osprey present) with potential nests hidden in thick fir trees. One additional new, but inactive, site was recorded in 2001.

E3.2.2.4 American Peregrine Falcon

The peregrine falcon was removed from the federal endangered species list in August 1999. Following a severe decline due largely to DDT contamination and a subsequent recovery after DDT was banned, the number of nesting peregrine falcons in California is

now estimated at 150 pairs (B. Walton, 1999, U.C. Santa Cruz, Predatory Bird Research Group, pers. comm.). Peregrine falcons typically nest on large (>10 m), vertical cliffs (Call 1978). They capture primarily birds in a variety of habitats, usually near a water source, including wetlands, lakes, and rivers (Zeiner et al. 1990).

The population of peregrines in California has staged a remarkable recovery, due to extensive captive breeding and reintroduction. During statewide surveys conducted in 1994, 100 peregrine pairs were found in 123 nest territories; these constituted only 73 % of all known territories. And, the researchers found an additional 23 new territories. The statewide Peregrine Falcon Recovery Plan suggested establishing at least one nesting pair of peregrines in the PNF by 1994 (USFS 1988). Since that time, the PNF in cooperation with the Santa Cruz Predatory Bird Research Group has released peregrines at two historical eyries, one near Milford Road and another above Oroville Road. In 1987, a pair of peregrines nested successfully at the Milford Road site. In 1999, the Licensee was informed by USFS of another pair of peregrines nesting within the project vicinity, along the upper NFFR between Canyon Dam and Caribou No. 1 and No. 2 powerhouses.

E3.2.2.4.1 American Peregrine Falcon Study Methods

Surveys for peregrine falcons were conducted by searching potential habitats during helicopter surveys for bald eagles in 2001 and included looking for falcons, nest sites, and other evidence of breeding (e.g., whitewash) along cliffs in the NFFR canyon as per Fuller and Mosher (1987).

E3.2.2.4.2 American Peregrine Falcon Study Results

The nearest known eyrie to the project is located in the NFFR canyon on cliffs just upstream of the confluence with Ohio Creek (Figure E 3.2-2). This is the site reported to the Licensee by the USFS in 1999, and it was active in 2001; at least two young were visible at the eyrie opening on 31 May; G. Rotta, USFS, Mt. Hough R.D. wildlife biologist, pers. comm.).

No other peregrine falcon breeding areas were found during 2001 surveys.

E3.2.2.5 California Spotted Owl

In the project area, the California spotted owl is found in dense, multi-layered, old growth, mixed conifer forest habitat, where it feeds largely on small mammals. Nesting territories are often found in narrow, steep-sided canyons on north-facing slopes.

Region 5 of the USFS classifies the California spotted owl as a Sensitive Species. It is not currently protected under provisions of either the state or federal Endangered Species Acts. Spotted owl Protected Activity Centers (PACs) have been identified on USFS land (PNF) in the vicinity of Butt Valley Dam and at one location adjacent to the east shore of the reservoir, south of Cool Springs campground. The Licensee conducted a spotted owl survey in 1994 from the east shoreline of the reservoir beginning at Butt Valley Powerhouse and progressing south to a point approximately one-half mile below Butt Valley Dam. The survey was conducted from the shoulder of the road at night using taped calls. Responses were detected only within the two PACs previously identified by

the USFS. Follow-up surveys were conducted during the breeding season in 1995, to determine whether nest sites were present at these locations. No owls were detected during these surveys.

No records of California spotted owls were found for the immediate vicinity of Lake Almanor.

Database searches and consultation with agency biologists in 1999, identified 18 area records for spotted owl within a one-mile radius of the canyon reach of the project (Canyon Dam to Belden). These were identified as occurring in the reach from Caribou No.1 and No. 2 powerhouses south. The status of these sites (breeding or non-breeding; currently active or inactive) is not known at this time.

E3.2.2.6 Northern Goshawk

Region 5 of the USFS lists the northern goshawk as sensitive. The PNF LRMP designates a network of 60 goshawk potential territories throughout the forest. These are areas where habitat is to be managed to ensure continuation of a viable local population. No goshawk potential territories are currently identified within the Butt Lake Management Area (#26). However, the Licensee conducted nesting and post-fledging goshawk surveys at Butt Valley Reservoir in June and August 1994. These surveys followed the "Survey Protocol for Northern Goshawk on National Forest Lands in the Pacific Southwest Region" (June 1992). A road-side survey was performed using existing roads starting at Butt Valley Powerhouse and continuing south along the east

shore of the reservoir to a point about one mile south of the dam. Call stations were established at approximately 0.2-mile intervals. During the nesting season survey (June), one silent approach response was elicited from an adult female goshawk at station one, located near the powerhouse. No further contacts with goshawks were made during this survey or during the August post-fledging survey. These results suggest that no goshawks were nesting in the immediate vicinity of the reservoir in 1994.

One database record for Goshawk was found within the vicinity of Lake Almanor (CNDDDB #11851). The record is of a nest site located on private land south of the town of Chester and approximately 10 miles northwest of Canyon Dam. This was active at least as recently as 1984. PG&E conducted spring season surveys for goshawk at a proposed quarry site off the Seneca Road, south of Canyon Dam in 1996. The survey resulted in one silent approach by an adult goshawk, but no indication of nesting in the immediate vicinity.

No goshawk records were found during database searches in 1999, covering the canyon reaches of the project from Canyon Dam to Belden Powerhouse.

E3.2.2.7 Willow Flycatcher

The willow flycatcher (*Empidonax trailii brewsteri*) is a state-listed endangered species and is also listed by Region 5 of the USFS as sensitive. It is an uncommon summer resident found in montane riparian and wet meadow habitats at elevations from 2,000 to 8,000 ft (Zeiner et al. 1990). This subspecies is one of four subspecies of the willow flycatcher. It is distributed from coastal California (north of Los Angeles) north through western Oregon and Washington to Vancouver Island (Federal Register 1992). It is often found in broad, open river valleys or large meadows with a dense shrub understory of willows (Serena 1982).

The Licensee conducted a habitat suitability assessment within the project area for this species using ground reconnaissance and interpretation of aerial photography. Database searches revealed no records of this species from the immediate vicinity of Butt Valley Reservoir. The closest record found was from a location approximately 3 miles west of the reservoir (CNDDDB # 11902). Suitable large stands of willow habitat are not found in the vicinity of the reservoir, making it unlikely that the species occurs there.

No records of this species were found from the immediate vicinity of Lake Almanor. The record discussed above, occurring approximately 3 miles west of Butt Valley Reservoir, is within the vicinity of Lake Almanor. Three other records of this species were found to the northeast of Lake Almanor, falling either within the project vicinity (10-miles from project features) or the project region (beyond 10-miles from project features). Some suitable or potentially suitable habitat for the species occurs along and adjacent to the

western shoreline of the Lake in the area between Last Chance Campground and Chester airport.

No records of this species were found for the canyon reach of the project between Canyon Dam and Belden Powerhouse and habitat is generally not suitable in this part of the project area.

E3.2.2.8 Greater Sandhill Crane

The greater sandhill crane (*Grus canadensis tabida*) is listed as threatened under the California Endangered Species Act, and as sensitive by Region 5 of the USFS. Once a fairly common breeder of California's northeastern plateau (Grinnell and Miller 1944), the greater sandhill crane is now greatly reduced in numbers and breeds only in Siskiyou, Modoc, and Lassen counties and in the Sierra Valley, Plumas and Sierra counties (James 1977; Remsen 1978; McCaskie et al. 1979). This species prefers open habitats with shallow lakes and fresh emergent wetlands for nesting (Zeiner et al. 1990), and open shortgrass plains, grain fields, and open wetlands for foraging (Grinnell and Miller 1944).

The Licensee conducted a habitat suitability assessment within the project area for this species using ground reconnaissance and interpretation of aerial photography. Database searches revealed one record within the immediate vicinity of the project. One pair of adult cranes with young was observed in 1981 in a large meadow immediately north of Lake Almanor (CNDDDB # 11939). Database searches revealed four other records falling within the project vicinity. Some suitable or potentially suitable habitat for the species

occurs along and adjacent to the western shoreline of the lake in the area between Last Chance Campground and Chester airport.

E3.2.2.9 Great Blue Heron

The great blue heron (*Ardea herodias*) is not currently listed under either the State or Federal Endangered Species Acts, and is not currently listed as sensitive by Region 5 of the Forest Service. Its colonial nesting sites, called rookeries, are currently identified by the California Department of Forestry and Fire Protection as “sensitive” during the review of private commercial timber harvest plans. The Resources Code of the State of California also classifies the great blue heron as a fully protected non-game species.

Great blue herons are found in fresh and saline wetlands or other water bodies where shallows are available for foraging (Zeiner et al. 1990). Herons nest in colonies called rookeries, usually in the tops of large trees or snags in secluded locations free from human disturbance.

E3.2.2.9.1 Great Blue Heron Study Methods

Surveyors searched for heron rookeries during bald eagle helicopter surveys; whitewash-coated trees of active rookeries were highly visible during the 18 June 2001 survey.

E3.2.2.9.2 Great Blue Heron Study Results

Three active rookeries were found along the shore of Lake Almanor: one near the dam, one near Northshore Campground, and a third at the confluence of the Hamilton Branch (Figure E 3.2-1). In addition, two roost trees frequently utilized by double-crested cormorants (*Phalacrocorax auritus*) were noted incidentally along the shore of Lake Almanor.

E3.2.2.10 Sensitive Bats (Pallid Bat, Townsend's Big-Eared Bat, and Western Red Bat)

The pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Plecotus townsendi*), and Western red bat (*Lasiurus blossevillei*), are each listed by Region 5 of the USFS as sensitive. Little information is available on habitat relationships of these nocturnal insectivores. Bats spend over half their lives in the roost environment. During the day, bats are inactive in the roost to conserve energy, and at night, they roost in order to rest and keep warm in between periods of feeding. During the reproductive season (April through September), female bats gather in maternity colonies to give birth, and their roost sites are especially important refuges during pregnancy and lactation. Adult females leave their flightless young behind in the roost while foraging, although they return periodically to nurse. By the fall, the young are independent. The colonies may remain active in the vicinity of the natal roost year round, or they may migrate out of the area.

Target sensitive bat species potentially occurring within the project area are expected to make use of both day roosts and nighttime foraging roosts. Day roosts can occur under

the loose bark of trees, in caves, or in many types of man-made structures. Night roosts are usually closely associated with foraging areas. Bridges often provide ideal conditions for night roosting bats.

Surveys conducted along the NFFR by the Licensee in the vicinity of the Poe Project (FERC 2107) in 2000 acoustically detected both Pallid bats and Western red bats in the vicinity of Poe Dam, Poe Reservoir, Poe Powerhouse Road and Bardees Bar Road (Pierson et al., 2001). The PNF does not currently have management guidelines for these species. No other records for these species were found during database searches covering the project region.

E3.2.2.10.1 Bat Study Methods

Specially trained and experienced biologists from the consulting firm, Garcia and Associates, performed the field surveys for bats in 2001. Primary surveys covering the entire project area were conducted over a two-week period in June 2001 (4th - 7th and 11th -14th). Follow-up surveys occurred over a similar period in August 2001 (6th -10th and 13th -17th). The June surveys were conducted to identify structures occupied by bats. The August surveys were for the purpose of assessing changes in bat use of structures and any changes in species composition including addition of species not detected during the spring surveys.

A combination of survey techniques was used during each survey period. These involved inspection of day and night roost areas, monitoring of free-flying bats, and capture of bats

for examination. Species identity and characterization of bat use of structures was based on direct observation whenever possible. Most of the structures found occupied by bats accommodated direct observations. In some instances, access to structures where bats were roosting was limited and/or the bats were hidden or absent at the time of the survey. In such cases, indirect evidence such as bat sign was used to facilitate species identification and to characterize use. Bat sign consists primarily of urine stains and guano deposits (which are often identifiable to taxonomic groups, or sometimes species).

Visual Inspections. Surveyors investigated the interior and exterior of PG&E facilities (augmented with spotlights) during the day and early evening as part of visual searches for bats and their sign (guano and urine staining). If a structure contained a colony or guano from more than one species of bat, surveyors monitored it from sunset to approximately 2330 hrs using a spotlight for periodic checking of roost areas, and an infrared digital camera to record behavior whenever possible. PG&E employees, USFS employees, and campground managers were interviewed regarding bat observations.

Infrared Digital Recording. A digital handycam (Sony DCR-TRV740) with infrared capability (augmented with an infrared spotlight attachment) was used to observe roost emergences, record the behavior of foraging bats, and to reduce disturbance when checking night roosts.

Acoustic Sampling. Acoustic technology was used to monitor the ultrasonic echolocation calls of free-flying bats both inside and outside occupied structures.

Specifically, the Anabat broadband ultrasonic detector (Titley Electronics, Inc., New South Wales, Australia) was used in conjunction with Anabat6 software (Chris Corben, Rohnert Park, California) on a portable laptop to record sonagrams of the calls of passing bats for real time review and also to record them on the hard drive for later analysis. Townsend's big-eared bats are difficult to detect acoustically; therefore, visual inspections were the only means of finding this species. Pallid bats and red bats are detectable using the Anabat system.

E3.2.2.10.2 Bat Study Results

Numerous bat colonies were found day and night roosting in Licensee facilities. The species present were Yuma myotis (*Myotis yumanensis*), little brown myotis (*M. lucifugus*), big brown bat (*Eptesicus fuscus*), and Mexican free-tailed bat (*Tadarida brasiliensis*). Two roosts were confirmed as maternity colonies

Townsend's Big-Eared Bat. Probable evidence of Townsend's big-eared bats was documented in the Caribou Clubhouse at a single site. Identifiable species-specific guano had been deposited on a table in the dining room sometime between the June and August survey periods. Following discovery, the location was monitored on a daily basis for several days, but no new guano was deposited; therefore, no evidence of current occupation was found. The isolated occurrence and absence of returning bats makes further confirmation of presence and use difficult. Licensee hydroelectric personnel volunteered to check the table twice a week for newly deposited guano following the end of the survey. They recently (25 September 2001) reported no guano found.

Pallid Bat. Pallid bats do not appear to be occupying PG&E facilities in the survey area. No evidence of this species was found in the project area. Previous surveys along the NFFR associated with the Poe Hydroelectric Project (Poe Dam to the Poe PH) characterized their presence as “very rare” (Pierson et al., 2001).

Western Red Bat. The Western red bat is a foliage roosting species and, if present in the project area, is unlikely to be affected by routine operation and maintenance of project facilities. No surveys were performed specifically aimed at the detection of Western red bat roosts. However, acoustical sampling conducted in areas suitable for foraging by red bats (over open water with roosting structures available) did not result in detection of this species.

Significant Bat Roost Sites

Belden Dam. Roughly 2,000 bats were found occupying five expansion joints in the concrete deck above the radial gates, and an unknown number of bats were roosting inside the overflow chamber immediately adjacent to the dam. Neither the bats nor their guano deposits immediately below the joints are interfering with operations. The species present included Yuma myotis, little brown myotis, and Mexican free-tailed bat (as determined by direct observation of roosting bats and by acoustic monitoring). The interior of the overflow chamber forms a cavity and this cavity was the most suitable appearing roosting location for Townsend’s big-eared bats identified during the surveys. The chamber was not accessible for inspection. Therefore, surveyors visually (augmented

with infrared video) monitored bats emerging from both sides of the chamber (concurrently) on two evenings, and did not observe any Townsend's big-eared bats. These crevices are occupied by reproductive bats during the spring and summer, as indicated by the presence of juvenile bats (a dead juvenile myotis bat was collected from a shelf over the spillway near a gate, and juvenile bats were heard vocalizing from inside the crevices at dusk).

Camp Caribou Clubhouse. Large numbers of day and night roosting bats have used the attic for decades. The clubhouse is not occupied or in use at this time, and the bats are not a nuisance.

Caribou No. 1 Powerhouse. A large colony of Yuma myotis and little brown myotis were found day roosting at the top of the stairs on the open walls. Urine stains were extensive and reflect decades of occupation. At night, the bats roost in the stairwell and near the ceiling at the east and west ends of the upper floor near the large windows. Surveyors monitored this floor during night roosting periods with video and acoustic equipment and did not find any additional species using the powerhouse as a night roost. Guano deposition litters the stairs but is probably not a nuisance since this floor is unoccupied by personnel or equipment. In June, at least ten years of accumulated guano was observed. Between June and August, some guano piles were removed.

Caribou No. 2 valve house. At least two bat species were found primarily night roosting in the uppermost room. They roost in the windowsill and next to the door-less entry, and they do not interfere with operations.

Caribou No. 1 and Caribou No. 2 intake towers. Two or more species of bats were found roosting under corrugated roofing and siding both during the day and at night. When the bats are flying around entering and exiting the roost sites, they defecate in the work areas, and thus may be considered a nuisance. Licensee personnel reported that they clean up the guano about once a month.

Butt Valley Powerhouse. Several hundred bats (several species) are day roosting in the 'supports' of the Gantry crane. They apparently do not affect, or are not affected by, operations.

Bridge near upstream penstock portal. Yuma myotis were found roosting in-between the wooden beams of the bridge, at the end nearest the valve house. They do not cause any damage to the structure.

Valve house structures at upper penstock portal. Bats were found roosting on the windowsills under the metal louvers.

Canyon Dam intake tower. Several hundred myotis bats were found roosting in the crevices at the center of the roof. The presence of dead juvenile bats on the floor

indicates that this is a maternity colony. Large amounts of guano littered the floor and machinery below. It appears that Licensee personnel have tolerated the litter for long periods of time.

Butt Valley intake tower. Surveys identified approximately two hundred myotis bats day roosting and probably night roosting under the siding and roofing. When the bats are flying around entering and exiting the roost sites, they defecate in the work areas, and thus may be considered a nuisance. Licensee personnel reported that they clean up the guano about once a month.

A general summary of the results of site specific visual surveys and infrared recordings is presented in Table E 3.2-5.

Table 3.2-5. Site-Specific Results of Visual Inspections and Infrared Recording of Bats

Project Feature	June surveys	August surveys
Belden PH/bathroom/kiosk	No bat sign	No bat sign
Gansner Bar CG (USFS)	No bat sign (fire station not surveyed)	No sign on bathroom, but USFS fire station adjacent to CG had myotis and <i>Eptesicus</i> guano
North Fork CG (USFS)	No bat sign	Few pieces myotis guano
Queen Lily CG (USFS)	No bat sign	Few pieces myotis guano
Wood bridge on access road to downstream siphon portal	No bat sign	No bat sign
Wood bridge at Queen Lily CG	No bat sign	No bat sign
2 nd wood bridge above Queen Lily CG	No bat sign, treated with creosote	No bat sign
Belden siphon adits #2-4	No bat sign or habitat	Not included
Belden adit #1 road bridge	No bat sign	No bat sign

Project Feature	June surveys	August surveys
Belden siphon surge chamber	No bat sign	Not included
Belden tunnel adit #1	No bat sign	No bat sign
Belden dam control building/stand-by generator building	Bat sign (myotis) inside both buildings; staining and guano	A bit more guano than in June, myotis and <i>Eptesicus</i> . Access by electrical wiring holes?
Belden dam radial gate structures, overflow chamber between spillway and reservoir	Cursory inspection- bats not detected	Roughly 2,000 bats occupying five expansion joints and the overflow chamber (<i>Myotis yumanensis</i> , <i>M. lucifugus</i> , and <i>Tadarida brasiliensis</i>) Found dead juvenile and heard juveniles vocalizing during exodus (maternity roost). Watched exodus twice, no <i>Corynorhinus</i> seen.
Belden intake tower	Bat sign in interior, small amounts (myotis)	myotis guano
Oak Flat PH	Bat sign on building exterior, and in yard. Night roosting in penstock tunnel about 20 ft inside, needs further observation. No sign in interior.	myotis guano from night roosting now extends to locations about 200 ft inside tunnel. Netted tunnel and no captures. Monitored bats foraging near PH lights.
Camp Caribou; dormitory	Bat sign in attic, probably myotis and <i>Eptesicus</i> . No bats present.	More sign in attic than in June, myotis and <i>Eptesicus</i> . Used drop sheets to catch guano and confirm that attic is in current use (<i>Eptesicus</i>). Only one bat observed there during day (myotis) and it may have been dead.
Camp Caribou; clubhouse	Approx. 300 <i>Myotis yumanensis</i> day roosting in attic	About 6-700 myotis day and night roosting (throughout attic). <i>Corynorhinus</i> guano in common room but no current use.

Project Feature	June surveys	August surveys
Camp Caribou; 10 employee homes	Two homes had some <i>Myotis guano</i> in attics, one home had a shed in back with guano (<i>myotis</i> night roost), three homes not surveyed (occupied by employees)	Night survey at shed had no bats but plenty of <i>myotis guano</i> and activity outside. At two homes, occupants denied access for bat surveys but stated that no bats were present; checked third home, no bats. Three homes with some guano 12-50 pieces, one home has open window to attic
Camp Caribou; warehouses, boat and trailer awning	No bat sign	No bat sign
Camp Caribou; poolhouse bathroom, pumphouse, Caribou office attic, water tank, storage shed	No bat sign	Poolhouse bathrooms have lots of <i>myotis guano</i> now, night roosting here. Storage shed, office attic, tank no bat sign.
Bridge on road between Caribou Camp and Caribou PH	No bat sign, heavily treated with creosote	No bat sign
Caribou No. 1 PH	Approx. 300 <i>Myotis yumanensis</i> ; day and night roosting	About 14 <i>myotis</i> day roosting and 12 <i>myotis</i> night roosting (extremely hot weather may have reduced colony size)
Wooden water tank on Butt Valley road	No bat sign	Not included
Caribou #2 valve house	Guano was evidence of night roosting in upper room with no door (captured <i>Eptesicus fuscus</i>)	A piece or two in valve house- lots of <i>Eptesicus guano</i> in upper building right next to doorless entry
Caribou #1 valve house	No bat sign (lots of mouse feces)	No bat sign
Wooden sheds over winches on top of penstock below #1 valve house	Some <i>myotis guano</i> (night roosting)	Some <i>myotis guano</i> (night roosting)
Metal bridge over penstock near Caribou #1 valve house	No bat sign	No bat sign
Butt Valley Dam communication building	No bat sign	A few <i>myotis</i> pieces on exterior, none interior

Project Feature	June surveys	August surveys
Butt Valley Dam generator building adjacent to communication building	Staining and myotis guano in interior	Staining and myotis guano in corners of interior, holes in window screens may allow access
Caribou 1 intake tower	Loads of myotis guano	Day and night roosting myotis, mostly under corrugated siding over gauging equipment table
Caribou 2 intake tower	Loads of myotis guano	Day and night roosting myotis, possibly <i>Eptesicus</i> roosting over extinguisher box
Bridge over Butt Valley dam spillway	No bat sign or habitat	Not included
Cool Springs CG	Sign of night roosting on all building exteriors	All buildings used by myotis and possibly <i>Eptesicus</i> - more sign than found in June
Alder Picnic Area	Sign of night roosting on building exteriors	All bathrooms have guano. Written sign on door about "rodent infestation".
Ponderosa Flat CG	Sign of night roosting on all building exteriors	All bathrooms have myotis night roosting, light (20 pcs) to moderate (100 pcs).
Butt Creek bridge on power house road	No bat sign	Not included
Bridge over penstock just above PH	No bat sign or habitat	Not included
Butt Valley PH	No bat sign in interior, some myotis guano on outbuilding in window louver	300+ myotis and some <i>Tadarida</i> day roosting in Gantry crane, day and night roosting in metal housing in yard, and in window louver of PH entrance outbuilding
Bridge near upstream penstock portal	Approx. 150 <i>Myotis yumanensis</i>	myotis roost
Valve house structures at upper penstock portal (Hal Bunger and another over penstock)	Bat guano in interior and evidence of roosting under window louvers	About 62 day roosting myotis under window louvers, and 10 myotis in same area in small house over penstock. Night roosting also. Accessing room interior behind loose window screens.

Project Feature	June surveys	August surveys
Canyon Dam/Lake Almanor intake tower	Loads of myotis guano	Roughly 300 myotis day and night roosting inside in center of roof. Found dead pups (maternity roost).
Butt Valley intake tower	Loads of myotis guano	Day roosting and probably night roosting. Access under corrugated siding and roofing.
Lk Almanor diffusion chamber and valve tower-head of north fork		New site on opposite side of dam, may be more than one myotis species and <i>Eptesicus</i> night roosting here (guano)
Almanor service center	No bat sign within fenced yard, one home outside needs further observation, the other home has no sign	myotis and <i>Eptesicus</i> guano (and staining) in attic of large researcher home, long term use but probably less than 100 bats. No bat sign within fenced yard, no sign in little home.
Prattville warehouse, meteorology lab, storage structures	No bat sign	A few pieces of guano on storage shed, myotis and <i>Eptesicus</i>
Stumpy Beach	Sign of night roosting bats on building exterior	Sign of night roosting on exterior
Westwood Beach	Not accessible	Not included
Hamilton Branch Recreation Area	Public access from water	Not included
Recreation Area #1 and #2	No public access	Not included
Catfish Beach and Picnic Area	No buildings observed, just beach area	Not included
Last Chance CG	Sign of night roosting bats on building exteriors-more than one species of bat at one building	Sign of night roosting bats on building exteriors, myotis and <i>Eptesicus</i>
CalTrans Rest Stop	No bat sign	Not included
Licensee CG Fox Farm, Mountain View, Rocky Point	Sign of night roosting bats on exterior	Sign of night roosting bats on exterior of wooden building, none on cinder block or artificial wood outbuildings
Almanor Scenic Overlook	No bat sign	No bat sign
Eastshore Picnic Area	No bat sign	No bat sign
Canyon Dam boat launch and parking area (USFS)	No bat sign	No bat sign

Project Feature	June surveys	August surveys
Canyon Dam Day Use Area	bat sign on bldg. exterior	Small amount of bat sign
Almanor CG/boat launch (USFS)	Small amount of bat sign on building exterior	Small amount of bat sign on exterior

E3.2.2.11 Forest Carnivores (Sierra Nevada Red Fox, California Wolverine, Pacific Fisher, and American Marten)

The Sierra Nevada red fox (*Vulpes vulpes necator*) is listed as threatened under the California Endangered Species Act, and as sensitive by Region 5 of the USFS. It is found in alpine dwarf-scrub, wet meadows, subalpine conifer, lodgepole pine, red fir, aspen, montane chaparral, montane riparian, mixed conifer, ponderosa pine, Jeffrey pine, eastside pine, and montane hardwood conifer habitats (Zeiner et al. 1990). This species is nocturnal and seldom seen. It is usually found at elevations above 7,000 ft, and occasionally below 5,000 ft in the Sierra Nevada Mountains. According to Steinhart (1990), an average of 20 sightings per decade were reported from 1950 to 1980. Most sightings were reported from Lassen and Yosemite Parks.

The wolverine (*Gulo gulo luteus*), listed as threatened under the California Endangered Species Act and sensitive in Region 5 of the USFS, utilizes habitats similar to those described above for the Sierra Nevada red fox, but may range to even higher elevations.

The Pacific fisher (*Martes pennanti pacifica*) and the American marten (*M. americana*), both USFS Region 5 sensitive species, are forest dwellers not dependent on lakes or reservoirs or associated near-shore habitats for feeding or breeding, but with demonstrated riparian habitat affinities.

Database searches revealed only one forest carnivore record for the immediate area of Lake Almanor. A Sierra Nevada red fox (CNDDDB #11905) was sighted near the town of Chester on the west shore of Lake Almanor in 1973. No CNDDDB records of forest carnivores were found from the vicinity of Butt Valley Reservoir or the canyon reaches of the project between Canyon Dam and Belden Powerhouse. The Licensee conducted forest carnivore surveys at Butt Valley Reservoir during late June and early July 1994, using single sensor photographic bait stations (Kucera and Barrett 1993). Two stations were used, one located along the existing Butt Valley - Caribou 115 kV transmission line right-of-way north of Ponderosa Flat Campground and the other located below Caribou Road approximately 1 mile south of Butt Valley Dam. No sensitive carnivores were detected.

Licensee and CDFG biologists investigated a reported sighting of a wolverine at Caribou No.1 and No. 2 powerhouses in 1982. The eyewitness was interviewed and physical evidence (tracks) preserved at the scene was examined, resulting in the conclusion that the animal was more likely a fisher.

The Licensee conducted forest carnivore surveys again using single sensor photographic bait stations in the winter of 1988, in the vicinity of Caribou Road near Belden siphon. No sensitive carnivores were detected, and no further recent sightings or reports of rare carnivores are known from the canyon reach of the project.

Database searches revealed five records of Pacific fisher (1946, 1974, 1980, 1984, and 1995) from the greater project watershed region. Of these, the one occurring in closest proximity to the project is a 1980 record from near the community of Westwood, northeast of Lake Almanor. The most recent record of this species (1995) is from the vicinity of Taylorsville, southeast of Lake Almanor.

E3.2.2.11.1 Forest Carnivore Study Methods

The currently accepted standard for forest carnivore surveys in the Western United States is the methodology described by Zielinski and Kucera (1995) titled, *American Marten, Fisher, Lynx, and Wolverine: Survey Methods for Their Detection*. Zielinski and Kucera (1995) describe several techniques for performing forest carnivore surveys and suggest approaches for applying these techniques to achieve specific goals.

The technique chosen for use in the project vicinity utilized photographic bait stations with single sensor camera systems. These systems employ a passive infrared transmitter that sends a pulsating beam of infrared light to a data logger. The data logger is cabled to a 35 mm single lens reflex camera with flash. When the infrared beam between the transmitter and the data logger is broken, an event is recorded (time and date) and a single frame of film is exposed. Circuitry allows various settings that determine the length of time the beam must remain broken before an event is recorded, and how frequently photos are taken. A pulse delay of 20 seconds was selected for the majority of the study after determining that shorter pulse delay settings were easily affected by weather (falling snow).

Eight to ten pounds of salmon from the State hatchery at Oroville and fish emulsion were used to bait each station. The bait sack was positioned so that an animal closely approaching it would break the beam.

Detection surveys of this type are done generally for one of two reasons: 1) to acquire information needed to formulate regional management strategies and policy affecting large geographical areas (e.g., a National Forest), or 2) to determine whether target species are present in an area where some management activity is proposed (Zielinski and Kucera 1995). The latter is referred to as a "Project Survey." Surveys performed in support of the Upper NFFR Project relicensing are an example of this type of detection survey. Allocation of sample units and sampling sites generally followed the recommendations presented in Zielinski and Kucera (1995; pg.18). Figure E 3.2-3 shows the location of sample sites selected for this study. Zielinski and Kucera (1995) recommend 18 sample sites dispersed over a 36 square-mile area for project surveys. This study employed 11 original sample sites, while receiving additional area coverage (e.g., suitable habitat along the southern shoreline of Lake Alamnor and the area surrounding Last Chance Creek camp ground) from studies recently completed by the Lassen National Forest (personnal communication, Lassen Forest biologist, Mike Magnuson, Chester Ranger Station).

During the week of March 6, 2000, one baited camera station was deployed at each of the 11 project area locations shown in Figure E 3.2-3. These stations were visited and

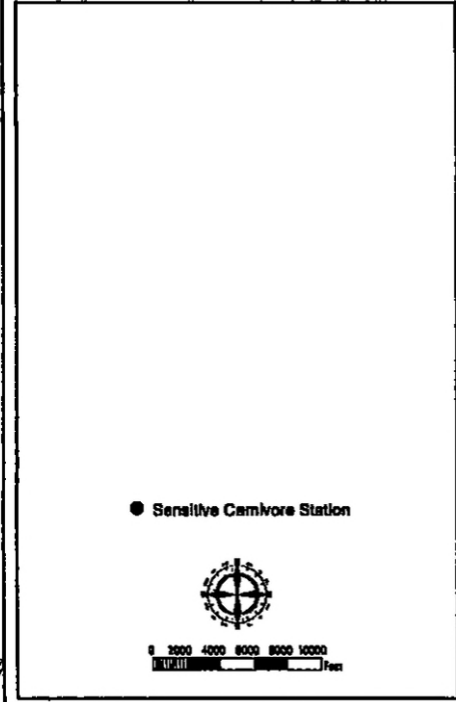
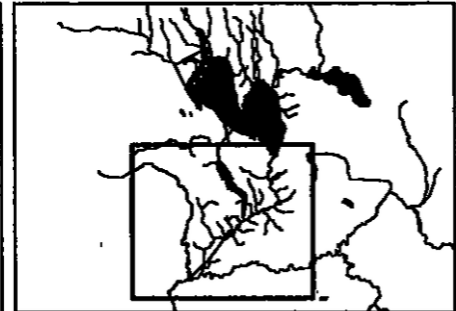
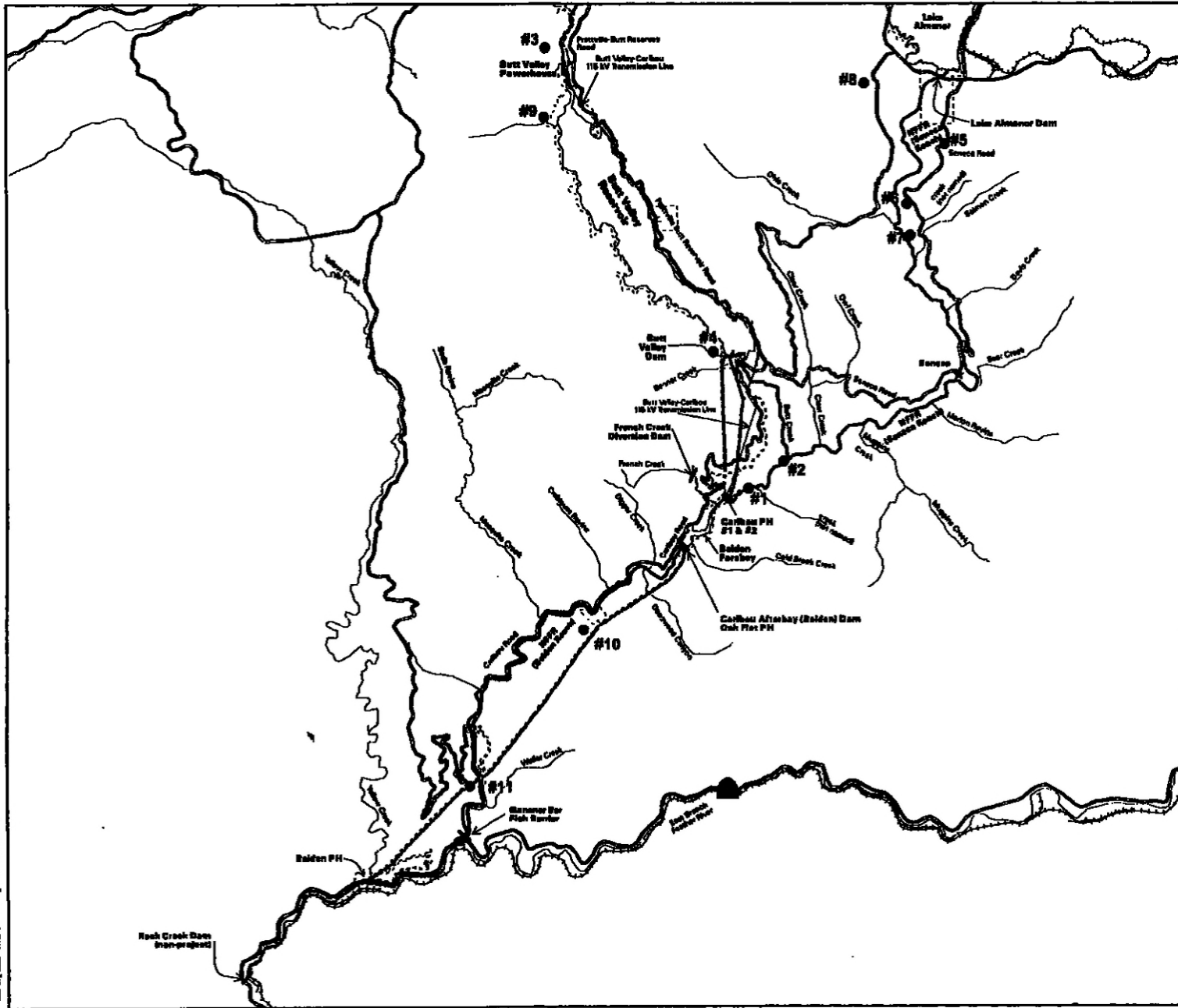
maintained weekly thereafter through the week of April 6, 2000. All event data stored in the data loggers were electronically downloaded and then transferred to a laptop computer for analysis. Exposed film was collected, fresh film was placed in each camera, and the bait was freshened during each station visit. After the film was developed any animal images were archived on CDs.

3.2.2.11.2 Forest Carnivore Study Results

Over the month-long study period, a total of six forest carnivore species were photographed in the study area. These data are summarized in Table E 3.2-6.

Each of the 11 camera stations was visited by one or more species over the period of study. The most frequently detected species was the gray fox, photographed at eight of the 11 camera stations. An example of animals photographed at bait stations is presented in Figure E3.2-4. No sensitive forest carnivore species were detected.

An effort was made to evaluate the efficiency of the system used to detect sensitive species. Records were kept weekly of the equipment performance at each station. A variety of effects can lead to a station falling inoperative between maintenance visits. These include the camera flash not operating correctly, camera out of alignment, film entirely exposed, or bait entirely removed. Overall, the 11 stations performed with an average efficiency of 84 percent (range 46.3 (1): 100 (3)).



Upper North Fork Feather River
 FERC No. 2105
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Figure E3.2-3
 Sensitive Forest Carnivore Monitoring Stations

Table E3.2-6 Summary Of Animal Activity Documented At Remote Photographic Bait Stations, Upper NFFR Project.

STATION NO.	WEEK. 1	WEEK. 2	WEEK. 3	WEEK. 4
1	None	Gray fox	Gray fox	Gray fox
2	Spotted skunk	Spotted skunk	None	None
3	Coyote	None	None	Black bear
4	Gray fox	None	None	Black bear
5	Gray fox	None	None	None
6	None	Gray fox	Gray fox	Gray fox
7	None	Gray fox	Gray fox	Gray fox
8	None	Coyote	Bobcat	None
9	None	Bobcat	Black bear	Bobcat
10	Ringtail Gray fox	Gray fox Ringtail	Gray fox Ringtail	Gray fox Ringtail
11	None	Gray fox	Ringtail	None
ALL SPECIES RECORDED	Spotted Skunk Coyote, Gray Fox, Ringtail	Gray Fox, Spotted Skunk, Coyote, Bobcat, Ringtail	Gray Fox, Black Bear, Bobcat, Ringtail	Gray Fox, Black Bear, Bobcat, Ringtail

E3.2.3 Impacts of Existing Project

The Licensee recognizes that some of the special status species listed in Table E3.2-2 occur in the immediate project vicinity. However, available information and the results of studies performed specifically for the relicensing effort suggested no significant adverse effects to these species from the continued operation and maintenance of the existing project.

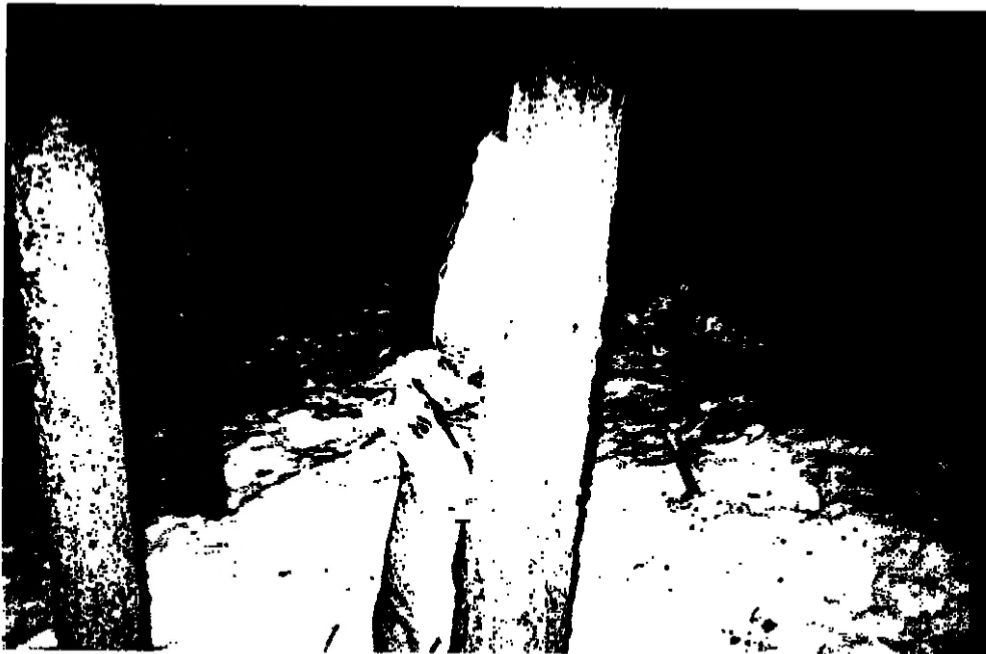
Valley Elderberry Longhorn Beetle. Field surveys identified just one VELB host plant in the immediate vicinity of the project, and this plant was not occupied. The project lies at the upper elevation limit of this species, and habitat suitability here is very low. Continued operation and maintenance of the project will have no effect on VELB.

Bald Eagle. The nesting population of bald eagles in the project vicinity continues to increase, a fact indicative of the quality of habitat afforded by project reservoirs for foraging and adjacent timberlands for nesting. Continued operation and maintenance of the project in combination with Licensee's established bald eagle protection policies and continued regional forest management practices designed to protect nesting habitat and breeding birds will continue to favor expansion of bald eagles in the project area toward the natural carrying capacity of the species.

Figure E3.2-4 Selected Examples of Wildlife at Camera/Bait Stations



Ringtail Cat (*Bassariscus astutus*) Photo Station No. 10



Gray Fox (*Urocyon cinereoargenteus*) Photo Station No. 5

Other Forest Raptors. Suitable breeding and foraging habitat for other sensitive forest raptors known to occur in the project area, including the American peregrine falcon, goshawk, and California spotted owl will not be affected by continued operation and maintenance of the project.

Greater Sandhill Crane and Willow Flycatcher. Habitat assessments conducted for these species identified areas of suitable breeding habitat in the causeway arm of Lake Almanor and south along the west shoreline of the lake. Available habitat in these areas will not be impacted by continued operation and maintenance of the project.

Bats. No evidence was found of the presence of sensitive bat species occurring presently within project structures. A number of non-sensitive bat species were detected or found occupying a variety of project structures. Continued operation and maintenance of project structures has the potential to affect these bat species through direct disturbance of roosting bats, elimination of roosting sites, or eliminating access to roosting sites.

Forest Carnivores. No sensitive forest carnivores were detected during field studies conducted for these species. The continued operation and maintenance of the project is unlikely to affect the suitability of existing forest carnivore habitat or otherwise impact these species should they occur in the project vicinity.

E3.2.4 Agency Recommended Measures

Agency comment letters and Licensee responses are provided in Report E-9.

E3.2.5 Licensee Proposed Measures

Bald Eagle Management. Management zones for bald eagle nesting territories in the Upper NFFR Project area were developed by the Licensee in 1988 for all nest sites occurring at that time (Pacific Gas and Electric Company 1988). These management zones provide up to a one-half mile buffer around existing nesting tree stands, less if sheltered by topography, to protect the site from human disturbance and development and provide suitable habitat for future nesting opportunities. Land ownership within these nest management zones is principally USFS, Licensee, and private timber companies (e.g., Collins Pine), and therefore cooperation between all land managers is required to ensure the continued viability of these bald eagle breeding areas.

The following management recommendations are proposed for each bald eagle nesting territory currently found in the Upper NFFR Project area based on the findings in this relicense application and Pacific Gas and Electric Company (1988):

1. Limit habitat alterations within the management zone to those that will enhance bald eagle nesting habitat and that pose no hazard to eagles (e.g., timber harvest would be allowed if under a silvicultural prescription to encourage long-term regeneration of large pines). Reduction of fuel loading is recommended in all nesting zones, where necessary.

2. Apply seasonal restrictions to compatible habitat alterations in the management zone.

Excepting emergencies, no such activity should be allowed in the management zone between 1 January and 31 July. If a nesting attempt fails during a certain year, this restriction may be eased, but only after approval of the land or wildlife manager.

3. Discourage new recreational development or policy changes that would alter the current use of the nesting area by public users. No new permanent access roads should be allowed in the management zone.

4. Current operation of hydroelectric facilities in the Upper NFFR Project area appears compatible with bald eagle nesting. Schedule non-emergency maintenance of power lines (e.g., vegetation removal or trimming operations) outside the bald eagle breeding season.

5. Managers should consider the effects of any proposed alterations to the operation or configuration of existing water facilities on the abundance of bald eagle prey species and availability of eagle foraging habitats at Lake Almanor, Butt Valley Reservoir, and Mountain Meadows Reservoir.

Greater Sandhill Crane and Willow Flycatcher Habitat Enhancement. Licensee proposes to design and implement a resource management plan for the causeway area of Lake Almanor, from Last Chance Campground south along the west shore of the lake to approximately the northern edge of the flood control channel south of the Chester airport. This plan will benefit a variety of sensitive biological resources including rare plants,

wetlands, streamside riparian communities, cultural resources, and sensitive wildlife habitats.

The Westside Resource Management Plan will examine current land use and project-related operational effects in arriving at specific protection and enhancement measures for the Licensee fee title lands. At a minimum, the plan will examine opportunities for resource enhancement through modifications to grazing practices, controlling off-road vehicle traffic, limited controlled recreation access, riparian zone revegetation, and control of noxious weed populations throughout the management area. Licensee proposes to develop this plan in consultation with state and federal resources agencies and other interested non-governmental organizations.

Opportunities to encourage greater sandhill crane nesting in marsh habitats within the management area will be identified. Expansion of willow vegetation for the enhancement of willow flycatcher breeding habitat will likely involve both restrictions on livestock grazing and active revegetation of suitable willow species.

Bats. Licensee proposes to use humane exclusion techniques to remove bats from project structures, followed by elimination of access ways to prevent their return. Heavy maintenance of project road bridges, favorite bat roosting sites, will be scheduled outside the breeding season to minimize impacts on potential breeding sites. Where bats occur within project structures but pose no adverse effect on operations, they may be allowed to remain.

E3.2.6 Anticipated Impacts of Continued Operation

Expansion of existing recreation facilities and development of additional facilities has the potential to impact present and future breeding habitat for bald eagle, osprey, great blue heron, greater sandhill crane, and other species that require undisturbed access to shoreline areas at Lake Almanor and Butt Valley Reservoir. However, measures will be implemented at each of the recreation developments for the protection of sensitive wildlife species.

The Licensee recognizes that many of the special status species discussed in this application exist in the project vicinity. Although no impacts to these species have been identified resulting from the continued operation and maintenance of the project, should future project-related activities be proposed that have the potential to affect these species or their habitat, the Licensee will conduct surveys and coordinate with interested resource agencies in arriving at suitable protection or avoidance measures.

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Report E3
FISH, WILDLIFE, AND BOTANICAL RESOURCES

Section E3.3
BOTANICAL RESOURCES

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Report E3

FISH, WILDLIFE, AND BOTANICAL RESOURCES

Section E3.3

BOTANICAL RESOURCES

E3.3 Botanical Resources

Vegetation communities are assemblages of plant species growing in areas characterized by similar biological and environmental factors. Vegetation community types discussed here are generally based on the *List of Natural Communities Recognized by the Natural Diversity Database* (1997), and *The Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995).

E3.3.1 General Upland Vegetation

Upland vegetation in the project vicinity can be broadly divided into three community categories as tree dominated, shrub dominated, or herb dominated. These vegetation types are described below with reference to their location within the project area. Detailed vegetation cover type maps of the entire project have been prepared on CD and are available from the Licensee on request.

E3.3.1.1 Tree-Dominated Communities

E3.3.1.1.1 Canyon Live Oak Series

In the project vicinity, canyon live oak forest is a diverse habitat found on both serpentine and non-serpentine substrates in the Caribou-Belden area as a transitional habitat between foothill oak woodlands and montane coniferous forests. On deeper, moister soils, this habitat intergrades with mixed conifer forest. Non-serpentine canyon live oak forest is found on granitic, volcanic, and metasedimentary soils. This habitat is similar to mixed evergreen forest and contains many of the same characteristic species but is overwhelmingly dominated by canyon live oak (*Quercus chrysolepis* var. *chrysolepis*). The thin soils generally limit tree height to less than 30 feet. Other common species in the tree layer include Douglas fir (*Pseudotsuga menziesii* var. *menziesii*), Pacific madrone (*Arbutus menziesii*), and ponderosa pine (*Pinus ponderosa*). On steep slopes, the understory is limited to leaf litter, and rock outcrops are common. On gentle slopes and along roadsides or openings in the dense canopy, the understory includes a mix of native shrubs and forbs. Cool, moist drainages generally contain more Douglas firs, madrones, and bigleaf maples (*Acer macrophyllum*). Characteristic shrubs include deer brush (*Ceanothus integerrimus*), poison oak (*Toxicodendron diversilobum*), western mock orange (*Philadelphus lewisii*), toyon (*Heteromeles arbutifolia*), whiteleaf manzanita (*Arctostaphylos viscida* ssp. *viscida*), Indian manzanita (*Arctostaphylos mewukka* ssp. *truei*), hoary honeysuckle (*Lonicera hispidula* var. *vacillans*), and California pipevine (*Aristolochia californica*). Common forbs in the shaded areas include trail plant (*Adenocaulon bicolor*), shaggy hawkweed (*Hieracium albiflorum*), and Bolander's bedstraw (*Galium bolanderi*). On sunny road edges or other openings in the canopy,

common species include woolly sunflower (*Eriophyllum lanatum*), California melic grass (*Melica californica*), coyote mint (*Monardella odoratissima* ssp. *pallida*), sulphur pea (*Lathyrus sulphureus*), and blue wildrye (*Elymus glaucus* ssp. *glaucus*). Common species around granitic rock outcrops include sticky bush monkeyflower (*Mimulus aurantiacus* ssp. *bifidus*) and silverleaf lotus (*Lotus argophyllus* var. *fremontii*).

On serpentine-derived soils, canyon live oak forest is more open, with emergent Douglas fir and foothill pine (*Pinus sabiniana*). On less limiting serpentine soils, ponderosa pines are also common. Understory species are different on serpentine substrates, dominated by species associated with serpentine foothill pine woodland. Dominant species in the shrub layer include California bay (*Umbellularia californica*), wedgeleaf ceanothus (*Ceanothus cuneatus*), toyon, and hoary coffeeberry (*Rhamnus tomentella*). Dominant forbs on serpentine include azure penstemon (*Penstemon azureus*), coyote mint, California melic, Indian's dream (*Aspidotis densa*), and naked buckwheat (*Eriogonum nudum* var. *oblongifolium*).

E3.3.1.1.2 Mixed Conifer Series

In the Caribou-Belden area, the canyon live oak forest transitions to a mixed montane coniferous forest on more gentle slopes away from the steep, rocky, river canyon walls. This habitat is more common near Butt Valley Reservoir and Lake Almanor. Dominant species in the tree layer include ponderosa pine, Douglas fir, incense cedar (*Calocedrus decurrens*), white fir (*Abies concolor*), canyon live oak, black oak (*Quercus kelloggii*), and bigleaf maple. The shrub and herb layer is poorly developed in the dense shade of the

forest, limited to leaf litter and widely scattered saprophytes. Openings in the dense forest canopy, such as road edges, are dominated by deer brush, poison oak, greenleaf manzanita (*Arctostaphylos patula*), and hoary honeysuckle on dry sites. Pacific dogwood (*Cornus nuttallii*) is a common understory species on more mesic slopes and flats. Typical herbs found in openings in the dense canopy include multi-stemmed sedge (*Carex multicaulis*), shaggy hawkweed (*Hieracium albiflorum*), Bolander's bedstraw (*Galium bolanderi*), rattlesnake plantain (*Goodyera oblongifolia*), and trail plant (*Adenocaulon bicolor*).

At the higher elevations of the project, around Lake Almanor and Butt Valley Reservoir, Douglas fir is no longer a dominant species in the tree layer; ponderosa pine and white fir are the dominant species, with incense cedar and sugar pine (*Pinus lambertiana*) as important components. The forest floor is dominated by leaf litter and widely scattered saprophytes such as pine drops (*Pterospora andromeda*). Shrubs are found at forest edges and openings, dominated by mountain whitethorn (*Ceanothus cordulatus*), Sierra gooseberry (*Ribes roezlii*), greenleaf manzanita, and creeping snowberry (*Symphoricarpos mollis*). The herb layer, where sunlight penetrates the overstory, is dominated by Ross' sedge (*Carex rossii*), Wright's blue-eyed mary (*Collinsia torreyi* ssp. *wrightii*), and California brome (*Bromus carinatus*). Other characteristic species in this area include: western serviceberry (*Amelanchier pumila*), chinquapin (*Chysolepis sempervirens*), white-veined pyrola (*Pyrola picta*), bald hip rose (*Rosa gymnocarpa*), and Scouler's willow (*Salix scouleriana*).

E3.3.1.1.3 Lodgepole Pine Series

This single-species forest of lodgepole pine (*Pinus contorta* ssp. *murrayana*) is found in a band around the edges of wet montane meadow in the Lake Almanor area, influenced by the higher water table. Lodgepole pine is more flood- and water- tolerant than other conifer species. It occurs only at the higher elevations of the project vicinity. Stands of slender, small diameter trees are dense and with a thick layer of leaf litter and slash that preclude formation of an herb layer. Overall diversity is low; understory species are generally a sparse layer of species associated with adjacent wet and dry montane meadows (below), and forest openings.

E3.3.1.2 Shrub-Dominated Communities

E3.3.1.2.1 Leather Oak Series

On serpentinitic substrates in the Caribou Road area, a mixed serpentine chaparral is found dominated by leather oak (*Quercus durata*) and wedgeleaf ceanothus, with whiteleaf manzanita, rubber rabbitbrush (*Chrysothamnus nauseosus*), Fremont's silk-tassel (*Garrya fremontii*), prickly phlox (*Leptodactylon pungens*), and yerba santa (*Eriodictyon californicum*) as important components. Soils are shallow and rocky in this fire-maintained chaparral. The herb layer is restricted to openings in the mostly dense chaparral, dominated by colorful native forbs that find refuge from exotics in the limiting soil structure and chemistry. Common species in the herb layer include: common blue dicks (*Dichelostemma capitatum* ssp. *capitatum*), rayless daisy (*Erigeron inornatus*), purple sanicle (*Sanicula bipinnatifida*), Sierra morning-glory (*Calystegia malacophylla*), several lomatiums (*Lomatium* spp.), helianthella (*Helianthella californica*), scarlet

fritillary (*Fritillaria recurva*), and toothwort (*Cardamine pachystigma* var. *pachystigma*).

E3.3.1.2.2 Greenleaf Manzanita Series

This habitat is common in the Lake Almanor vicinity, often in areas disturbed by logging, fire, or other disturbances, and exists as a seral stage of the mixed conifer series. In this mixed chaparral, greenleaf manzanita is the dominant species but mountain whitethorn, Sierra gooseberry, bloomer's goldenbush (*Ericameria bloomeri*), and Mahala mat are important components. The density of the herb layer varies, depending on the age of the chaparral, and is dominated by white hackelia (*Hackelia californica*), needlegrass (*Achnatherum* sp.), coyote mint, Torrey's monkeyflower (*Mimulus torreyi*), pygmy tarweed (*Madia minima*), Torrey's cryptantha (*Cryptanthatorreyi*), diffuse groundsmoke (*Gayophytum diffusum*), and mountain violet (*Viola purpurea* ssp. *purpurea*). In recently disturbed areas, Spanish lotus (*Lotus purshianus*) is also common. Other characteristic species include Ross' sedge (*Carex rossii*), kelloggia (*Kelloggia galioides*), annual knotweed (*Polygonum* sp.), Wright's blue-eyed mary, mountain tarweed (*Madia glomerata*), and dwarf leucophysalis (*Chamaesaracha nana*).

E3.3.1.3 Herb-Dominated Communities

E3.3.1.3.1 Dry Montane Meadow

This habitat includes seasonally wet meadows in the transition to either dry meadow, lodgepole pine forest, or other upland habitats and is common in the Lake Almanor area at elevations near 4,510 feet. Examples are found at the periphery of Last Chance Marsh, along the north and west shore of Lake Almanor, and behind the Chester Airport.

Dominant species vary from site to site, but generally include one or more of the following dominant species: Kentucky bluegrass (*Poa pratensis*), tufted hairgrass (*Deschampsia caespitosa*), common yarrow (*Achillea millefolium*), meadow penstemon (*Penstemon rydbergii*), beaked sedge, Jones' muhly (*Muhlenbergia jonesii*), long-stalked clover (*Trifolium longipes* var. *nevadense*), and sheep sorrel (*Rumex acetosella*). Other common species include five-finger cinquefoil (*Potentilla gracilis*), biennial cinquefoil (*Potentilla biennis*), dusky horkelia (*Horkelia fusca* ssp. *parviflora*), three-toothed horkelia (*Horkelia tridentata* ssp. *tridentata*), and lupine (*Lupinus obtusilobus*). Vernal-wet depressions in the transitional meadow behind the Chester Airport include: woolly marbles (*Psilocarphus brevissimus*), Torrey's monkeyflower, cudweed (*Gnaphalium* sp.), awned nutsedge (*Cyperus squarrosus*), and yellow cress (*Barbarea orthoceras*).

Tufted Hairgrass Series: At Last Chance Marsh, in the transition from wet to dry meadow, is a band of seasonally moist meadow dominated by tufted hairgrass. Co-dominant species include bluegrass (*Poa* sp.), field mint, timothy (*Phleum* sp), and Baltic rush. Other characteristic species include California corn lily (*Veratrum Californicum* var. *Californicum*), western spiraea (*Spiraea douglasii*), and blue-eyed grass (*Sisyrinchium idahoense*). Rare plant taxa found in this habitat include northern bugleweed and marsh skullcap.

E3.3.2 Riparian and Wetland Vegetation

Riparian and wetland vegetation in the project vicinity is generally associated with the channel and bank environment of the NFFR and its tributary streams, as well as the near-shore environment of project reservoirs. Freshwater seeps and wet meadow habitats also occur locally. These vegetation types are described below with reference to their location within the project area. Detailed vegetation cover type maps of the entire project have been prepared on CD and are available from the Licensee on request.

E3.3.2.1 White Alder Series

This montane riparian forest is found throughout the NFFR corridor, from the Canyon Dam, downstream to the Belden Powerhouse, and along Butt Creek. The riparian corridor is narrow and discontinuous, due largely to gradient and bedrock constraints. This habitat is not found around the reservoirs, except at the outlet of tributaries. White alder riparian forest is absent in areas with high levels of disturbance, such as around powerhouses and immediately below dams, where it is replaced by a ruderal riparian habitat of the invasive Himalayan blackberry (*Rubus discolor*), scouring rush (*Equisetum arvense*), and upland exotics such as white sweet clover (*Melilotus alba*), Klamathweed (*Hypericum perforatum*), and woolly mullein (*Verbascum thapsus*) on gravel bars. Himalayan blackberry dominates the shrub layer from Belden Forebay to Belden Powerhouse. Himalayan blackberry is found sporadically around Butt Valley Reservoir, primarily in disturbed areas around campgrounds. Other characteristic species include: black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), arroyo willow (*Salix lasiolepis*), redbird dogwood (*Cornus sericea*), California wild grape (*Vitis californica*),

thimbleberry (*Rubus parviflorus*), Bolander's sedge (*Carex bolanderi*), hedgenettle (*Stachys ajugoides* var. *rigida*), bracken fern (*Pteridium aquilinum* var. *pubescens*), ciliate willow-herb (*Epilobium ciliatum* ssp. *ciliatum*), and American brooklime (*Veronica americana*).

E3.3.2.2 Freshwater Seeps

Seeps and springs are common in both the Last Chance Marsh and the Caribou Powerhouse area. In the Last Chance Marsh area, these seeps are associated with wet meadows; in the Caribou-Belden area, the seeps are generally associated with fractured serpentine or metasedimentary rock on steep slopes or cliff faces. The permanently moist or wet soil around seeps support a diverse group of native herbs. Dominant species in the Last Chance Marsh area include: lesser panicled sedge (*Carex diandra*), Lemmon's sedge (*Carex lemmonii*), western star sedge (*Carex echinata* ssp. *echinata*), beaked sedge (*Carex utricularia*), hybrid sedge (*Carex fissuricola* x *luzulina*), soft-leaved sedge (*Carex disperma*), inflated sedge, (*Carex vesicaria*), Nevada rush (*Juncus nevadensis*), sword-leaf rush (*Juncus ensifolius*), scouring rush (*Equisetum arvense*), seep-spring monkeyflower (*Mimulus guttatus*), big-leaved avens (*Geum macrophyllum*), bugle hedgenettle (*Stachys ajugoides* ssp. *rigida*), meadow barley (*Hordeum brachyantherum*), white-flowered bog orchid (*Platanthera leucostachys*), and many more.

In the Caribou-Belden area, seeps on serpentine or metasedimentary cliff faces or slopes support a different suite of species. Dominant species include white-flowered hastingsia (*Hastingsia alba*), leopard lily (*Lilium pardalinum* ssp. *Pardalinum*), white-flowered bog

orchid, stream orchid (*Epipactis gigantea*), wild azalea (*Rhododendron occidentale*), and golden-fruited sedge (*Carex aurea*).

E3.3.2.3. Freshwater Marsh Habitats

Freshwater marsh in the project vicinity is found as a fringe of marsh habitat around portions of Lake Almanor and Butt Valley Reservoir, and in small ponds near the Chester Airport in a disturbed habitat.

Pondweed Series. Dominant species in the lacustrine wetlands around Lake Almanor in the Last Chance Marsh area vary along a moisture and elevational gradient; aquatic species such as pond weeds (*Potamogeton pusillus* var. *temuissimus*, *P. nodosus*) and water smartweed (*Polygonum amphibium* var. *amphibium*) dominate the deeper water habitats, approximately one to four feet deep at the 4,500 feet elevation. Other characteristic species include common waterweed (*Elodea canadensis*), bogbean (*Menyanthes trifoliata*), and water shield (*Brasenia schreberi*).

Sedge Series. In the transition from permanently to semi-permanently flooded emergent wetland at Last Chance Marsh, inflated sedge clearly dominates; however, water sedge (*Carex aquatilis*), common bladderwort (*Utricularia vulgaris*), American brooklime (*Veronica americana*), creeping spikerush (*Eleocharis macrostachya*), hairy-leaved meadow arnica (*Arnica chamissonis* var. *incana*), and mannagrass (*Glyceria* sp.) are also common. Downy popcornflower (*Plagiobothrys mollis* var. *mollis*) often forms very large colonies in this transitional zone, particularly in grazed portions of the marsh. Other

characteristic species in this extensive lacustrine wetland at Last Chance Marsh include: slender beaked sedge (*Carex athrostachya*), lesser bladderwort (*Utricularia minor*), common bulrush (*Scirpus acutus* var. *occidentale*), and broadleaf cattail (*Typha latifolia*).

A seasonally flooded or saturated habitat dominated by sedges is found as a fringe of marsh between the ordinary low and high water mark at both Lake Almanor and Butt Valley Reservoir. This habitat often occurs in areas that were upland habitats prior to the construction of the two reservoirs. Overall diversity is low, limited to wetland species tolerant of fluctuating water levels. Dominant species here include: slender beaked sedge, fragile-sheathed sedge (*Carex fracta*), clustered field sedge (*Carex praeegracilis*), and Kentucky bluegrass. Other characteristic species include bull thistle (*Cirsium vulgare*) and other sedges (*Carex* spp.).

Spikerush Series. This habitat type is found in the small ponds and seasonally flooded depressions behind the Chester Airport. The once-disturbed ponds may have originally been part of the gravel mine now adjacent to the ponds to the west. They now have a diverse and well-established flora of wetland and aquatic species. The depressions south of the airport are seasonally flooded by fluctuating water levels on Lake Almanor but contain more or less the same characteristic species. They are dominated by creeping spikerush but co-dominants include: mountain spikerush (*Eleocharis montevidensis*), water pepperwort (*Marsilea vestita* ssp. *vestita*), water plantain buttercup (*Ranunculus alismifolius*), American brooklime, downy popcornflower, Baltic rush (*Juncus balticus*), field mint (*Mentha arvensis*), hairy-leaved meadow arnica (*Arnica chamissonis*), and

algae. Other characteristic species include common bladderwort, long-leaved pondweed (*Potamogeton pusillus* var. *tenuissimus*), creeping bentgrass (*Agrostis stolonifera*), and purslane speedwell (*Veronica peregrina* ssp. *xalapensis*).

E3.3.2.4 Wet Montane Meadow

At Last Chance Marsh, in the transition from freshwater marsh (below) to wet montane meadow, still influenced by Lake Almanor, a band of vegetation approximately eight to twelve feet wide at an elevation of approximately 4,505 feet, remains saturated well into the summer months. High diversity is found here and dominant species include woolly sedge (*Carex lanuginosa*), small-fruited bulrush (*Scirpus microcarpus*), mountain spikerush, water plantain buttercup, American brooklime, tinker's penny (*Hypericum anagalloides*), primrose monkeyflower (*Mimulus primuloides*), Baltic rush, field mint, Nevada rush, and sword-leaved rush. Other characteristic species include seep-spring monkeyflower, marsh cinquefoil (*Potentilla palustris*), California corn lily, timothy, Scouler's St. John's wort (*Hypericum formosum* var. *scouleri*), western spiraea, western blueberry (*Vaccinium uliginosum* ssp. *occidentale*), and trifid bedstraw (*Galium trifidum*).

E3.3.3 Special Status Plant Species

Special status plants are species in one or more of the following categories:

- Plants listed or proposed or that are candidates for listing as threatened or endangered under the federal Endangered Species Act;
- Plants listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act;
- Plants that meet the definitions of rare or endangered under the California Environmental Quality Act (CEQA);
- Plants considered by the CNPS to be "rare, threatened, or endangered in California: (Lists 1B and 2 in Skinner and Pavlik 1994);
- Plants listed by the California Native Plant Society (CNPS) as requiring more information before their status can be determined, and plants of limited distribution (Lists 3 and 4 in Skinner and Pavlik 1994); and
- Plants listed by the USFS Region 5 as Sensitive, Watch List or Special Interest species, including Record of Decision Survey & Manage non-vascular plant species such as mosses and lichens.

Pre-field investigations were conducted to review existing information and to prepare lists of special-status plants known from, or with potential to occur in the vicinity of the project. Table E3.3-1 presents a list of candidate Special Status plant species developed for the project area.

Table E3.3-1. Target List of Special Status Plants Potentially Occurring at the Upper NFFR Project.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Stillman's needle grass <i>Achnatherum stillmanii</i>	None None FSC2	---	---	June-July	Lower coniferous forests. Rocky soils under dry conditions, openings in montane coniferous forests. Moderate potential for occurrence; not found.
Henderson's bent grass <i>Agrostis hendersonii</i>	SOC None FSC2	G1Q S1.1	3 3-2-2	April-May	Mesic valley and foothill grassland and vernal pools. 70-305 m elev. Low potential for occurrence; not found.
Jepson's onion <i>Allium jepsonii</i>	SOC None FSS	G1 S1.2	1B 3-2-3	June-July	Cismontane woodland, lower coniferous forest; open serpentine or volcanic slopes, often in colluvium at road cuts. High potential for occurrence (known at Bardees Bar); not found.
Sanborn's onion <i>Allium sanbornii</i> var. <i>sanbornii</i>	None None FSC1	G3T5 S3.2	4 1-2-2	May- September	Chaparral, lower coniferous forest; rocky serpentine slopes; brushy serpentine or basic intrusive rocky soils in mixed conifer forest. 260-1,410 m elev. Moderate potential; not found.
Brown everlasting <i>Antennaria umbrinella</i>	None None FSC2	---	---	July	Sagebrush scrub slopes next to meadows and late snow basins, commonly above 6,000 feet in elevation. No suitable habitat; not found.
Contance's rock cress <i>Arabis constancei</i>	None None FSS	G2 S2.1	1B 2-3-3	May-July	Rocky serpentine slopes and serpentine road embankments. Not found during surveys but high potential along Caribou Road. 975-2,025 m elev.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Small-leaved rock cress <i>Arabis microphylla</i> var. <i>microphylla</i>	None None FS-C2	G5T4	4 1-1-1	July	Pinyon-Juniper woodland; volcanic or granitic crevices, rocky areas. 1,700-2,700 m. elev.; not found.
True's manzanita <i>Arctostaphylos mewukka</i> ssp. <i>truei</i>	None None None (former FSSI)	---	4 1-2-3	February- May	Chaparral, lower montane coniferous forest. Fairly frequent in Pulga Road area. Not found, but likely. No longer tracked by Plumas NF. 425-1,310 m. elev.
Large-flowered sandwort <i>Arenaria "grandiflora" sp.</i> <i>nov. Clifton</i>	A new, un-described species that is being tracked by the USFS and Caltrans	---	---	May-July	Granitic sands in open areas; generally east-or north-facing slopes. Lower coniferous forest, cismontane woodland. Known occurrences on Hwy. 70 and Pulga Road; not found in the project area.
Hillside arnica <i>Arnica fulgens</i>	None None FSSI	G5/S2.2	2/3-1-1	May-August	Great Basin scrub, coniferous forest, meadows. 1,495-2,700 m elev. Low potential; not found.
Susanville milk vetch <i>Astragalus inversus</i>	None None	G3 S3.3	4/1-1-3	May- September	Great Basin scrub, lower montane coniferous forest. 950-1,850 m elev., not found.
Lens-pod milk-vetch <i>Astragalus lentiformis</i>	None None FSS	G2 S.2	1B 3-2-3	May-June	Great Basin scrub, subalpine coniferous forest. Dry, often open, sandy slopes in high elevation pine forest. Low potential; not found.
Pulsifer's milk-vetch <i>Astragalus pulsiferae</i> var. <i>pulsiferae</i>	None None FSS	G4T2 S1.2	1B 3-2-2	May-August	Great Basin scrub, lower coniferous forest, Pinyon-juniper woodland; dry, sandy slopes on volcanic substrate in Ponderosa Pine forest. Moderate potential; not found.
Suksdorf's milkvetch	None	G4T3	1B	May-August	Great Basin scrub, lower coniferous forest.

E3.3-15

Upper North Fork Feather River Project, FERC No. 2105

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Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
<i>Astragalus pulstiferae</i> var. <i>suksdorfii</i>	None FSS	S32	3-2-2		Sandy or gravelly flats. 1,300-1,950 m elev. High potential; known occurrence at Chester airstrip not relocated; not found in the project area.
Webber's milk-vetch <i>Astragalus webberi</i>	None None FSS	G1 S1.2	1B 3-2-3	May-July	Lower coniferous forest. Dry brushy or wooded slopes in mixed conifer forest, commonly on rocky soils. 800-1,1220 m elev. Moderate potential; not found.
Mexican mosquito fern <i>Azolla mexicana</i>	None None None	--	4 1-2-1	August	Marshes and swamps; ponds and slow water. Not found. 30-100 m. elev., not found.
Big-scale balsamroot <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	None None FSW	G3T2 S2.2	1B 2-2-3	April-June	Cismontane woodland, valley-foothill grassland; openings and slopes, often on serpentine soils, below 2,500 feet in elevation. Moderate potential; not found.
Resin birch <i>Betula pumila</i> var. <i>glandulifera</i>	None None FSSI	?	2/2-2-1	April-June	Bogs and fens, lower montane coniferous forest, meadows, marshes and swamps, subalpine coniferous forest, mesic. 1,310-2,285 m. Known occurrences near the project area at Humbug Valley; not found.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Upswept moonwort <i>Botrychium ascendens</i>	None None FSS	G3? S1.3?	2 3-1-1	July-August	Lower coniferous forest; marshes and moist meadows; included in sensitive species list due to difficulty of identification from <i>B. crenulatum</i> . Moderate potential in Lake Almanor marsh. Not found.
Scalloped moonwort <i>Botrychium crenulatum</i>	None None FSS	G3? S1.3?	2 2-2-1	June-July	Bogs and fens, lower coniferous forest, upper coniferous forest. Marshes and moist meadows. Moderate potential in Lake Almanor marsh. Not found
Moonwort <i>Botrychium lineare</i>	None None FSS	G3? S1.3?	1B 3-1-2	August	Meadows, subalpine coniferous and upper coniferous forest. Marshes and moist meadows; included in sensitive species list due to difficulty of identification from <i>B. crenulatum</i> . Moderate potential in Lake Almanor marsh. Not found
Western goblin <i>Botrychium montanum</i>	None None FSS	G3? S1.3?	2 3-1-1	July-August	Marshes and moist meadows; included in sensitive species list due to difficulty of identification from <i>B. crenulatum</i> . Moderate potential in Lake Almanor marsh. Not found
Butte County calycadenia <i>Calycadenia oppositifolia</i>	None None FSS	G3 S3.3	1B 2-2-3	June-July	Chaparral, cismontane woodland, valley-foothill grassland. Open, dry meadows, hillsides and flats, often on serpentine. 215-945 m elev. No known occurrences in project vicinity; not found.
Butte County morning-glory <i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i>	None None FSS	G?T2 S2.3	1B 2-1-3	May-July	Lower coniferous forest; dry rocky places in open mixed conifer forest or brush, clearcuts. 600-1,200 m elev. Moderate potential; not found.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Sierra Valley evening-primrose <i>Camassonia tanacetifolia</i> ssp. <i>quadriperforata</i>	None None None	—	4 1-1-3	May-July	Great Basin scrub, lower montane coniferous forest; clay, sandy. 1,300–1,770 m. elev. Not found.
Dissected-leaf cardamine <i>Cardamine pachystigma</i> var. <i>dissectifolia</i>	None None FS-C1	G?T3 S2S3	3 ?-?-3	April-May	Chaparral, cismontane woodland, lower coniferous forest. Serpentine outcrops and drainages, often shaded sites. Occurs on Bardees Bar near Pulga Road and Bardee's Bar Rd. Not found in the project area.
Geyer's sedge <i>Carex geyeri</i>	None None FS-C2	G4 S3.2	4 1-2-1	May-July	Great basin scrub, lower coniferous forest. North-facing slopes in mixed conifer forest. Found at and around Skinner's Flat south of Lake Almanor.
Siskiyou sedge <i>Carex gigas</i>	None None FS-C2	G3? S3.3	4 1-1-2	May-July	Lower coniferous forest, meadows, upper coniferous forest. Meadows and moist, rocky serpentine soil. Potential habitat on serpentine outcrops on Caribou Road. Not found.
Slender sedge <i>Carex lasiocarpa</i>	None None FS-C2	G5 S1.3	2 3-1-1	June-July	Bogs and fens, marshes and swamps. Lakeshores and floating fens. Potential habitat at Lake Almanor marsh; not found.
Shore sedge <i>Carex limosa</i>	None None FS-C2	G5 S3	2 2-2-1	June-August	Boggy lakeshores and floating fens above 5,200 feet in lower and upper coniferous forest. Potential habitat at Lake Almanor marsh; not found.
Pointed broom sedge <i>Carex scoparia</i>	None None None	—	2 3-2-1	May	Great Basin scrub; mesic. 130-1,000 m. elev.. Not found.

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Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Sheldon's sedge <i>Carex sheldonii</i>	None None FS-C2	---	2/2-2-1	May-August	Lower montane coniferous forest (mesic), marshes and swamps (freshwater), riparian scrub. 1,200-1,755 m elev. Potential habitat at Lake Almanor marsh; not found.
Hoover's spurge <i>Chamaesyce hooveri</i>	FT SE FSS	G2 S2.1	1B 3-2-3	July	Vernal pools. Not suitable habitat in the project area; not found.
Large-seeded goosefoot <i>Chenopodium simplex</i>	None None FS-C2	---	4 1-1-1	June-October	Lower montane coniferous forest; serpentinite or volcanic. 1,100-1,995 m. elev. Not found.
Brandege's clarkia <i>Clarkia biloba ssp brandegeae</i>	None None FSS	G4T2 S2.2	1B 2-2-3	May-June	Chaparral, cismontane woodland. Road embankments, openings in mixed conifer forest. Moderate potential; not found.
White-stemmed clarkia <i>Clarkia gracilis ssp. albicaulis</i>	None None FSS	G5T2 S2.2	1B 3-2-3	June-July	Chaparral, cismontane woodland; Serpentine foothill woodland, often in colluvium on road cuts. Moderate potential for occurrences. Not found.
Mildred's clarkia <i>Clarkia mildrediae var. mildrediae</i>	None None FS-C1	G3 S3.3	4 1-1-3	June-July	Lower coniferous forest. Decomposed granitics in coniferous forest or montane oak woodlands, often in colluvium. Not found.
Mosquin's clarkia <i>Clarkia mosquinii var. mosquinii</i>	SOC None FSS	G1T1 S1.1	1B 3-3-3	June-July	Cismontane woodland, lower coniferous forest; foothill woodland and dry, rocky places, not on serpentine, often in colluvium. Found during previous surveys above Caribou Rd; no populations in the project area.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Enterprise clarkia <i>Clarkia mosquinii</i> var. <i>xerophila</i>	SOC None FSS	---	1B	May-July	Cismontane woodland, lower coniferous forest. No known occurrences in the project vicinity. Not found.
Stellate clarkia <i>Clarkia stellata</i>	None None FSS	---	---	June-July	Lower coniferous forest; openings in forest; roadsides. Many populations located along Lake Almanor shoreline and along Butt Valley Reservoir Rd. Rejected for CNPS Inventory.
Marsh claytonia <i>Claytonia palustris</i>	None None FS-C1	G3 S3.3	4	June-August	Montane marshes and swamps; Jonesville, Colby, etc. Not found.
Northern coralroot <i>Corallorhiza trifida</i>	None None FS-C2	G5 S.11	2 3-3-1	June-July	Moist openings in mixed conifer forest or rich woodland floors. Lower coniferous forest, meadows; meadow edges. Potential habitat near Lake Almanor marsh. Not found.
MacNab cypress <i>Cupressus macnabiana</i>	None None FS-C2	---	4 1-2-2	---	Serpentine slopes, 1600-3000 feet. Lower coniferous forest. No known occurrences in project vicinity. Not found.
California lady's-slipper <i>Cypripedium californicum</i>	None None FS-C2	G4 S3.2	4 1-2-2	April-June	Bogs and fens, lower coniferous forest. Along streams, in seeps or bogs, and wet ledges. Found at Caribou Powerhouse and along Caribou Rd.
Clustered lady's-slipper <i>Cypripedium fasciculatum</i>	SOC None FSS	G4 S3.2	4 1-2-2	May-June	Lower coniferous forest, North Coast coniferous forest; open coniferous forest, often associated with <i>Cornus nuttallii</i> on moist slopes or drainages. Not found.

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Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Mountain lady's-slipper <i>Cypripedium montanum</i>	None None FSS	G4 S3.2	4	March-July	Moist woods, mixed evergreen to yellow pine forests. Not found.
California pitcherplant <i>Darlingtonia californica</i>	None None FS-C2	G4 S3.2	4 1-2-1	April-June	Bogs and fens, lower coniferous forest; along streams, in seeps or bogs, and wet edges. Not found.
English sundew <i>Drosera anglica</i>	None None FS-C2	G5 S2S3	2 2-1-1	July-August	Bogs and swamps, often associated with <i>Darlingtonia californica</i> in mixed conifer forest. 1,300-2,000 m elev., not found.
Round-leaved sundew <i>Drosera rotundifolia</i>	None None FS-C2	---	---	July-August	Bogs and swamps, often associated with <i>Darlingtonia californica</i> in mixed conifer forest. Found at Last Chance Marsh.
Yellow willowherb <i>Epilobium luteum</i>	None None FS-C2	G5/S1.3	2 3-1-1	July- September	Lower coniferous forests; along streams. Not found.
Hot rock daisy <i>Erigeron inornatus var. callidepterus</i>	None None FS-C1	G5T3 S3.3	4	June- September	Sandy, volcanic soils. Occurs ca. 3 mi. north of Westwood. Not found in project area.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Plumas rayless daisy <i>Erigeron lassenianus</i> var. <i>deficiens</i>	None None FS-C1	-- --	--	July-August	Lower coniferous forest, serpentine. Dry, sandy or gravelly soil on the borders of meadows and small lakes. Not found.
Northern Sierra daisy <i>Erigeron petrophilus</i> var. <i>sierrensis</i>	None None FS-C1	G4T3 S3.3	4 1-1-3	July-August	Cismontane woodland, lower coniferous forest; rocky hills to montane forest, generally on serpentine. Not found.
Tripod buckwheat <i>Eriogonum tripodium</i>	None None FSSI	G3 S3.2	4	May-July	Gravelly soil of drainages, often on serpentine. Not found.
Butte County fritillary <i>Fritillaria eastwoodiae</i>	Species of concern None FSS	G3 S3.2	4 3-2-3	March-April	Chaparral, cismontane woodland, lower coniferous forest, dry benches and slopes in chaparral, foothill woodland, ponderosa pine forest or mixed conifer forest. Recently downgraded to CNPS List 4. Not found.
Amethyst stickweed <i>Hackelia amethystina</i>	None None FS-C1	G3 S3.3	4 1-1-3	June-July	Lower coniferous forest, meadows, forest clearings, along streambanks, and on roadsides. Not found.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Sierra Valley ivesia <i>Ivesia aperta</i> var. <i>aperta</i>	SOC None FS-C1	G2T2 S2.2	1B 2-2-2	June-July	Great Basin scrub, lower coniferous forest, meadows, Pinyon-Juniper woodland; usually volcanic. Not found.
Plumas ivesia <i>Ivesia sericoleuca</i>	SOC None FS-C1	G2 S2.2	1B 1-2-3	May-August	Great Basin scrub, lower coniferous forest, meadows, vernal pools. Not found.
Webber's ivesia <i>Ivesia webberi</i>	SOC None FS-C1	G2 S2.1	1B 3-3-2	June-July	Great Basin scrub, lower coniferous forest. Not found.
Center Basin rush <i>Juncus hemiendytus</i> var. <i>abjectus</i>	None None None	G5T4S3.3	4	June-July	Damp or vernal wet open areas. Not found.
Cantelow's lewisia <i>Lewisia cantelovii</i>	None None FSS	G3 S3.2	1B 2-2-3	June-July	Broadleaf upland forest; chaparral, cismontane woodland; steep, north to northeast-facing cliffs, rocky outcrops, often mossy sites. Found in Caribou area.
Hutchison's lewisia <i>Lewisia kelloggii</i> ssp. <i>Hutchisonii</i>	None None FS-C1	G4T2T3 S2S3.3	3 ?-1-3	June-July	Open ridge-tops, decomposing granitic soils and slate. Not found.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Humboldt's lily <i>Lilium humboldtii</i> ssp. <i>Humboldtii</i>	None None FS-C1	G4T3 S3.2	4 1-2-3	April-May	Chaparral, lower coniferous forest; openings in forest; yellow pine forest, occasionally on ultramafics. Not found.
Henderson's lomatium <i>Lomatium hendersonii</i>	None None None	---	2 3-1-1	April-June	Pockets of clay on open rocky ridges, slopes, and open gravelly volcanic scabland. Not found.
Quincy lupine <i>Lupinus dalesiae</i>	None None FSS	G3 S3.2	1B 2-2-3	June-July	Dry slopes in mixed conifer, often on phyllite. Lower coniferous and upper coniferous forests. Found at Butt Valley Reservoir.
Northern bugleweed <i>Lycopus uniflorus</i>	None None FS-C2	G5 S3.3	4 1-1-1	July- September	Lake margins, wet meadows and floating bogs and fens. Found at Last Chance Marsh.
Nelson's pepperwort <i>Marsilea oligospora</i>	None None FSSI	G5 S3?	3 (drop)	July-August	Marshes, vernal pools, slow water. Not found.
Moss <i>Meesia triquetra</i>	None None FS S&M	---	None	Spring	Meadows, bogs and wet woods, restricted to Sierran meadows, usually associated with sphagnum and cold springs/ seeps. Associated with <i>Vaccinium</i> . Known from a few sites in CA, including Tahoe National Forest. Not found.

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Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Moss <i>Meesia uliginosa</i>	None None FS S&M	---	None	Spring	Subalpine meadows; bogs and rock fissures, restricted to Sierran meadows, usually in the subalpine zone. Occurs in the Tahoe National Forest. Not found.
Shield-bracted monkeyflower <i>Mimulus glaucescens</i>	None None FS-C1	G3 S3.3	4 1-1-3	April-July	Cismontane woodland, valley-foothill grasslands; Seeps and springs on serpentine cliffs, often occurring with <i>Mimulus guttatus</i> . Not found.
Cut-leaved monkeyflower <i>Mimulus laciniatus</i>	None None None	G3 S3.3	4 1-1-3	April-July	Lower coniferous forest, upper coniferous forest; seeps and springs on granite outcrops, often occurring with <i>Mimulus guttatus</i> . Not found.
Egg Lake monkeyflower <i>Mimulus pygmaeus</i>	SOC None FS-C1	G4 S3.2	4 1-2-1	May-June	Great Basin scrub, lower coniferous forest, meadows. Vernal moist gravelly flats and swales. Not found, occurs just outside project, little suitable habitat.
Veiny monardella <i>Monardella douglasii ssp. Venosa</i>	SOC None None	G5T1 S1.1	1B 3-3-3	May	Valley-foothill grasslands; heavy clay soils. Not found.
Follett's monardella <i>Monardella follettii</i>	None None FSS	G1 S1.2	1B 3-1-3	June	Lower coniferous forest; rocky serpentine in lower coniferous forests. Not found, occurs nearby on metasedimentary soils and serpentine.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Stebbin's monardella <i>Monardella stebbinsii</i>	None None FSS	G1 S1.3	1B 3-1-3	July- September	Broadleaf upland forest, chaparral, lower coniferous forest; rocky serpentine slopes and outcrops. 780-1,100 m elev. Found in Caribou area.
Tehama navarretia <i>Navarretia heterandra</i>	None None none	G37 S3.3	4	May-June	Vernally wet grassy places, drainages, vernal pools, clay soil, in foothills. Not found.
Hairy Orcutt grass <i>Orcuttia pilosa</i>	FE SE FSS	G2 S2.1	1B 2-3-3	May-August	Vernal pools. Not found.
Slender orcutt grass <i>Orcuttia tenuis</i>	CE FT FSS	G3 S3.1	1B/2-3-3	May-July	Vernal pools from 35-1,760 m elev. Occurs just outside project, little suitable habitat in project; not found.
Plumas alpine-aster <i>Oreostemma elatum</i>	None None FSS	---	1B 3-2-3	July-August	Bogs, fens, upper coniferous forest. Wet meadows. 1,005-2,100 m elev. Occurs near Seneca, not found in project area.
Suksdorf's broomrape <i>Orobanche lucoviciana</i> <i>var. arenosa</i>	None None FSW	G5T5 S1.3	2 3-1-1	July-August	Slopes in sagebrush, parasitic on <i>Chrysothamnus</i> . Not found in project area.
Lichen <i>Orthotrichum spjutii</i>	None None FS S&M	---	None	---	Granitic rocks near water in protected, shaded underhangs. Fairly common on <i>Quercus chrysolepis</i> . Not found.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Ash beardtongue <i>Penstemon cinicola</i>	None None FSSI	G4 S3.2 ?	4	June-August	Dry or moist volcanic sands, yellow pine or lodgepole pine forests. Occurs ca. 3-4 mi. north of Westwood; not found in project area.
Shasta beardtongue <i>Penstemon heterodoxus var. shastensis</i>	None None FSSI	G5T3 S3.3	4 1-1-3	June-August	Meadowy, open grassy sites in yellow pine to red fir forest. Not found.
Closed-throated beardtongue <i>Penstemon personatus</i>	None None FSS	G2 S2.2	1B 2-2-3	June	Lower coniferous forest, upper coniferous forest; openings in mixed conifer forest. 1,065-2,120 m elev., not found.
Bacigalupi's yampah <i>Perideridia bacigalupii</i>	None None FS-C1	G3 S.2?	4 1-2-3	June-August	Openings in serpentine chaparral, lower coniferous forest. Not found.
Northern holly fern <i>Polystichum lonchitis</i>	None None FS-C2	G5	3	June-September	Subalpine coniferous forest, upper coniferous forest; granitic. Not found.
Nuttall's pondweed <i>Potamogeton epihydrus ssp. nuttallii</i>	None None None	---	2 2-2-1	July-August	Marshes and swamps; shallow freshwater. 400-1,900 m. elev. Not found.
White-stemmed pondweed <i>Potamogeton praelongus</i>	None None FS-C2	G5/S1S2	2/3-1-1	July-August	Deep cold water lakes, 1,800-3,000 m. elev. Not found.

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Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Sticky pyrrocoma <i>Pyrrocoma lucida</i>	None None FSS	G1	1B 3-1-3	July- September	Great Basin scrub, lower montane coniferous forest, meadows. Frequent in portions of Sierra Valley. Not found.
White beaked-rush <i>Rhynchospora alba</i>	None None FS-C2	G5 S3.2	2 2-2-1	July-August	Floating bogs on lakes and boggy meadows. Not found.
California beaked-rush <i>Rhynchospora californica</i>	SC None	G1 S1.1	1B 3-3-3	July-August	Lower coniferous forest, meadows, freshwater marshes and swamps; seeps. Not found.
Brownish beaked-rush <i>Rhynchospora capitellata</i>	None None FS-C1	G5 S2S3	2 2-2-1	July-August	Granitic crevasses, seeps, and very wet meadows. Not found.
Hall's rupertia <i>Rupertia hallii</i>	None None FSS	G1 S1.2	1B 3-2-3	July-August	Openings in mixed conifer forests, cismontane woodland. Not found.
Sessile-fruited arrowhead <i>Sagittaria rigida</i>	None None FSSI	?	(2)	May- September	Marshy lake margins, farm ponds. Last Chance Marsh. <i>Sagittaria</i> found at Last Chance Marsh not-in-bloom; ID not confirmed.
Valley sagittaria <i>Sagittaria sanfordii</i>	SOC None FSSI	G3 S3.2	1B 2-2-3	May-June	Marshes and swamps (freshwater), lake margins. Occurs at Madrone Lake. Not found in project area.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Tracy's sanicle <i>Sanicula tracyi</i>	Species of Concern None FSS	G3 S3.2	1B 1-2-3	May-July	Openings in woodland and coniferous forest; cismontane woodland, lower and upper coniferous forest; taxonomic problems. Not found.
American scheuchzeria <i>Scheuchzeria palustris</i> var. <i>Americana</i>	None None FSS	G5T5 S1.1	2 3-3-1	July-August	Floating sphagnum bogs, marshes and swamps; lake margins. Historic occurrence Lake Almanor. Not found in project area.
Water bulrush <i>Scirpus subterminalis</i>	None None FS-C2	G4G5/S2 S3	2/2-2-1	June- September	Freshwater marshes and lake edges, 750-2,250 m. elev. Not found.
Marsh skullcap <i>Scutellaria galericulata</i>	None None FSSI	G5/S2.2?	2/2-2-1	June- September	Swamps and wet places, 4,000-7,000 feet; lower montane coniferous forest, meadows (mesic). Found at Last Chance Marsh.
Feather River stonecrop <i>Sedum albomarginatum</i>	None None FSS	G2 S2.3	1B 3-2-3	July- September	Crevices and ledges on steep, serpentine cliff faces, partially shaded. Chaparral, lower coniferous forest. Found in Caribou area.
Cut-leaved ragwort <i>Senecio eurycephalus</i> var. <i>Lewisrosei</i>	None None FSS	G4T2 S2.2	1B 3-2-3	May-August	Chaparral, lower coniferous forest, cismontane woodland. Serpentine slopes, cliffs and canyons, often locally abundant. Occurs just outside project, and not found in project area.
Sweet marsh ragwort <i>Senecio hydrophiloides</i>	None None FSSI	G5 S2S3	3 (4)	May-July	Wet meadows in eastside pine or lodgepole forest. Not found.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Layne's ragwort <i>Senecio layneae</i>	FE FSS	G2	1B	April-July	Chaparral, cismontane woodland; serpentinite or gabbrodiorite soils. New populations found recently in Yuba County near Rackerby. Not found in project area.
Mallow "oswaldiana" per Taylor, "gigantea" per Clifton <i>Sidalcea sp. nov.</i>	— FSSI	---	---	July- September	Near seeps, streams, edges of wet meadows, shaded banks in middle to upper coniferous forests 2100- 5400 ft. Not found.
Cryptic catchfly <i>Silene invis</i>	None None FSW	G4	---	July-August	Open ponderosa pine forest and open upper montane glades. Not found.
Western campion <i>Silene occidentalis ssp.</i> <i>Longistipitata</i>	SOC None FSS	G4T1Q S1.2	1B 3-2-3	July-August	Dry open places in chaparral and mixed conifer forest. Not found.
Giant goldenrod <i>Solidago gigantea</i>	None None None	---	2 3-2-1	July- September	Meadows, marshes and swamps; wet meadows, marshes and streambanks. Not found.
Small burr-weed <i>Sparganium natans</i>	None None FSSI	G5S3.3	4 1-1-1	August	Marshes and swamps; lake margins, cooler places. Not found.
Long-leaved starwort <i>Stellaria longifolia</i>	None None FSSI	G5/S1.2	2/3-2-1	May-July	Meadows and seeps (mesic). Not found.

E3.3-30

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Obtuse starwort <i>Stellaria obtusa</i>	None None FSSI	G5	4 1-1-1	July	Forested meadows, streamside meadows, and sandbars along rivers. Not found.
Lemmon's clover <i>Trifolium lemmonii</i>	None None FS-CI	G4?	4	May-June	Great Basin scrub, lower coniferous forest. Not found.
Northern daisy <i>Trimorpha acris var debilis</i>	None None FSSI	G5ST4/S2 S3	G5T4 S2S3	July-August	Lava outcrops in subalpine forests. Not found.
Greene's tuctoria <i>Tuctoria greenei</i>	FE ST FSS	G2 S2.2	1B 2-3-3	May-July	Vernal pools. 30-1,070 m elev. Not found.
Flat-leaved bladderwort <i>Utricularia intermedia</i>	None None FSSI	?	2/2-2-1	July-August	Shallow water; 4000-7500 feet elevation. Bogs and meadows, marshes and swamps (lake margins). Found at Last Chance Marsh.
Cream-flowered bladderwort <i>Utricularia ochroleuca</i>	None None FSSI	?	2/3-2-1	June-July	Shallow water; 1,435-1,440 meters elev. Meadows (mesic); marshes and swamps (lake margins). Found at Last Chance Marsh.

Species	Listing Status Federal/State Forest Service	Rank Global & State	CNPS List Code	Flowering/ Phenology	Habitat Type
Suskiyou Mountains huckleberry <i>Vaccinium coccineum</i>	None	G5Q S2.2	3 2-1-7	June-August	Moist slopes in mixed conifer or red fir forest; known population in project area but no new populations found.
Woolly viola <i>Viola tomentosa</i>	None None FS-C1	G3	4 1-2-3	May-August	Flat, gravelly, usually granitic or volcanic areas above 5,000 feet. Not found in the project area.

1. Scientific names, common names, and habitat notes from Hickman (1993) and Skinner and Pavlik (1994).

2. Plant status definitions and governing agencies are as follows:

U.S. FISH AND WILDLIFE SERVICE

FE Endangered: Any species that is in danger of extinction throughout all or a significant portion of its range.

FT Threatened: Any species likely to become endangered within the foreseeable future.

CALIFORNIA DEPARTMENT OF FISH AND GAME

SE Endangered: Any species that is in danger of extinction throughout all or a significant portion of its range.

ST Threatened: Any species likely to become endangered within the foreseeable future.

SOC Special Concern: An administrative designation given to vertebrate species that appear to be vulnerable to extinction because of declining populations, limited ranges and/or continuing threats.

USDA FOREST SERVICE

FSS Forest Service Sensitive Plant: Species that are managed according to the Regional Forester's Sensitive Species Management Guidelines List per Forest Service Memorandum 2670.

FSSI Forest Service Special Interest.

FS-C1 Category 1: Special Interest: Survey and recommend conservation measures.

FS-C2 Category 2: Special Interest: Report occurrences and recommend conservation measures.

FSW Forest Service Watchlist plant

FS S&M Forest Service Record of Decision Survey and Manage species.

CALIFORNIA NATIVE PLANT SOCIETY

List 1B: Plants rare, threatened, or endangered in California and elsewhere.

List 2: Plants rare, threatened or endangered in California but more common elsewhere.

List 3: Plants about which we need more information.

List 4: Plants of limited distribution: A watch list.

Sources of information used in the preparation of Table E3.3-1 included a records search of the Plumas and Lassen National Forests, the CDFG's CNDDDB (CDFG 2000b) and the CNPS' Electronic Inventory (CNPS 2000b) for the U.S. Geological Survey 7.5-minute quadrangles of Almanor, Westwood West, Chester, Canyon Dam, Caribou, Twain, Belden, and the surrounding quadrangles Storrie, Kimshe Point, Humbug Valley, Mt. Harkness, and Red Cinder. Other references included the CNPS *Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1994); and the *Jepson Manual* (Hickman 1993). Other regional floras reviewed included the 1999 Draft *Plumas National Forest and Plumas County Flora* (Clifton 1999), and the *Manual of Vascular Plants of Butte County, California* (Oswald and Ahart 1994). Pre-field research included a search of the soil survey of the Plumas National Forest (USDA 1988) for the presence of ultramafic soils associated with rare plant taxa.

During the pre-field investigations, all currently known occurrences of special status plants in this region of the Plumas and Lassen National Forests were reviewed. Ms Linnea Hanson, botanist with the Plumas National Forest, and Ms Beth Corbin, botanist with the Lassen National Forest, were consulted for occurrence records and assistance in preparing the target lists of special-status plants and for the current lists of USFS Sensitive species and Watch List species. In addition, herbaria investigations were conducted at California State University at Chico and the University of California at Davis to gather additional information on distribution, taxonomic relationships and problems, and field identification characteristics for each candidate species.

The pre-field research and subsequent field surveys were conducted for the Licensee by the consulting firm Garcia and Associates (GANDA). GANDA's principal investigator was Ms. Virginia Dains. The botany crew leader was Ms. Carolyn Chainey-Davis. Both Ms. Dains and Ms. Chainey-Davis have extensive experience conducting surveys in the Sierra Nevada and southern Cascade regions. Intensive floristic surveys were conducted following the CDFG, CNPS, and USFWS protocols for rare plant surveys (CDFG 1984; USFWS 1996; Skinner and Pavlik 1994). These protocols recommend identifying all plant species encountered to the level necessary to ensure that special-status plants are detected, if present. In addition, it ensures that special status plants not targeted during field surveys are identified. Surveys conducted by GANDA were timed to coincide with the blooming periods of special status plants known from the vicinity. GANDA botanists conducted special status plant surveys of the project area on March 9, 20, April 6, 8-11, June 9, 11-15, 23, 26, 27, 29, July 9-14, 18, and August 8, 29-31. The surveys were conducted on foot, by survey teams of two botanists walking meandering transects through the project areas. All lands within the project FERC boundary were covered.

Canoes were used to access many areas around Lake Almanor, Butt Valley Reservoir, and Belden Forebay. Intensive surveys were concentrated in areas of suitable habitat. Such areas were identified by comparing observed habitat conditions against the conditions observed at known sensitive plant population sites identified suitable habitat. Known populations of each target species were visited before the surveys to familiarize the GANDA staff with current phenology and microhabitat preferences of each species. In

addition, all "unique habitats," such as creeks, bogs, seeps, springs, meadows, scabs, ridge-lines, serpentine habitats, and rock outcrops, were surveyed intensely.

Locations of special status plant species were recorded on USGS quads and, where satellite reception was adequate, UTM coordinates for each population were collected using a Trimble GeoExplorer II GPS (Global Positioning System) unit. Differential corrections of GPS points were made using PathFinder Pro post-processing software to obtain locations accurate within 2-5 meters. Charleen Gavette, GIS specialist for GANDA, received the corrected GPS files and quad maps and used them to prepare the final map of special status plant locations.

During the spring and summer 2000 surveys of the project area, from Lake Almanor to the Belden Powerhouse at the confluence of Yellow Creek and the NFFR, GANDA found and mapped one-hundred fourteen occurrences of twelve special status plant species. The locations of special status plants found in the project area are presented in the consultant's botanical survey report. The consultant's report of surveys is presented, in its entirety, in Appendix E3.3-1.

E3.3.3.1 Special Status Plants Within the Project Area

Special status plants that occur within the Upper NFFR Project area are identified below along with a brief description of their life histories, substrate preferences, and plant associates.

Geyer's sedge (*Carex geyeri*) – A perennial, rhizomatous sedge occurring in turf-like clumps in mixed conifer forest, Geyer's sedge is a CNPS and Forest Service watch list species. Four populations of Geyer's sedge were located by GANDA botanists in the project area: two previously known occurrences at Skinner Flat, and two new occurrences in the NFFR drainage approximately one-half to one mile downstream of the Canyon Dam. The populations closest to Skinner Flat may have been affected by logging activities and tend to extend along both sides of the access road. Douglas fir and ponderosa pine dominate vegetation at this site. *Carex geyeri* plants were growing in association with *Arctostaphylos patula* and *Ceanothus cordulatus* in moderately thick pine duff.

Starry clarkia (*Clarkia stellata*) – An annual herb in the family Onagraceae, flowering from April to June, *Clarkia stellata* is a USFS sensitive species. It is locally abundant in the Almanor region. Starry clarkia is usually associated with Sierran mixed conifer forest of *Pinus ponderosa*, *Abies concolor*, and *Pseudotsuga menziesii*, and is frequently found on sunny road embankments or other open areas with an understory of *Senecio integerrimus* and *Ribes roezlii*. *Clarkia stellata* was found in abundance on the southeast

shore of Lake Almanor, and along Butt Valley Reservoir Rd. Populations ranged in size from a few individuals to over 300.

California lady's-slipper (*Cypripedium californicum*) -- A monocot in the family Orchidaceae, *Cypripedium californicum* is a perennial herb that flowers from May to June. This CNPS List 4 species occurs from Shasta to Butte County and Del Norte to Marin County at elevations of approximately 150 feet to over 7,000 feet. Populations on USFS lands in some areas of California are apparently not reproducing, according to CNPS (Skinner and Pavlik 1994). It is most commonly found on seeps and springs on serpentine rock outcrops, but it also occurs on metasedimentary rock. Known occurrences of *Cypripedium californicum* are located within project boundaries near the Caribou No. 1 and No. 2 Powerhouses and at a permanent spring approximately 1 mile north of the Queen Lily Campground on Caribou Rd. These populations were relocated, and this orchid was observed growing in association with *Rhododendron occidentale*, *Platanthera leucostachys*, *Carex aurea*, *Carex bolanderi*, and *Epipactis gigantea*.

Round-leaved sundew (*Drosera rotundifolia*) – This carnivorous plant, closely related to the rare *Drosera anglica*, is of special interest to both the USFS and CNPS because of frequent hybridization between the two species. No hybrids occur in the project area, but one significant population (greater than 200 plants) of round-leaved sundew was located within project boundaries in the marshy areas at the western tip of Lake Almanor. This population was located in a bog area within the marsh, between the Last Chance campground and the Lake Almanor shoreline, in association with several *Carex* spp.,

Juncus nevadensis, *Montia chamissonis*, *Epilobium oregonense*, and *Hypericum anagalloides*. A second population is located just outside project boundaries on the marshy bench west of Lake Almanor.

Cantelow's lewisia (*Lewisia cantelovii*) -- A perennial herb in the family Portulacaceae, this species occurs on north, northeast, and northwest-facing granite or metamorphic cliffs of the Feather River canyon. These cliff microsites experience surface water flow in spring and during rains. Often the plants are nestled among mosses or club mosses. It occurs from Shasta to Nevada counties at elevations of 1,200 feet to 4,400 feet, and many populations are threatened by horticultural collecting or road or trail maintenance. Many known populations are located on cliff faces along Highway 70, south of the project area. Recently, a new, large population was found on a serpentine cliff face on the east side of the river at Pulga Bridge. Cantelow's lewisia was not formerly known to occur on serpentine substrates.

In the project area, *Lewisia cantelovii* occurs in the river corridor nearly 2 miles north of Queen Lily campground and on the east side of Caribou Rd. approximately 0.5 mile further north. There is another small population at the confluence of the NFFR and East Branch NFFR. These populations occur on weathered serpentine, in the serpentine chaparral community. Associated species include: *Selaginella* sp. and *Montia* sp., and on the adjacent upland, *Quercus chrysolepis*, *Quercus durata*, *Ceanothus cuneatus*, *Arctostaphylos viscida*, etc.

Quincy lupine (*Lupinus dalesiae*) – A perennial herb in the Pea family, Quincy lupine is endemic to California and is considered rare by CNPS. This lupine is easily identified by its yellow flowers (unique among the Feather River lupines and produced from May to July) and delicate, silvery-hairy leaves. According to CNPS, its existence may be threatened by logging and road maintenance; however, it favors open or disturbed areas and its distribution may also be correlated with the above activities. Several populations are known from the Butt Valley area in association with Douglas fir, ponderosa pine, incense cedar, *Ceanothus prostratus*, *Ceanothus integerrimus*, *Chrysothamnus nauseosus*, and *Arctostaphylos patula*, and *Carex rossii*. Within the project area, this species was found exclusively on steep, sunny road embankments on a loose, slate-like substrate. Ten occurrences of Quincy lupine are located within the project area, the majority of which occur near Butt Valley Reservoir Rd. Populations ranged in size from a few to over 70 plants.

Northern Bugleweed (*Lycopus uniflorus*) – This CNPS List 4 species is a perennial, rhizomatous herb in the mint family and blooms from June to September. It is a USFS sensitive species. Northern bugleweed was found in transitional habitats of the marsh at the western tip of Lake Almanor, occasionally in association with the rare *Scutellaria galericulata*. Other associated species include *Carex vesicaria*, *Carex lanuginosa*, *Poa* spp., *Phleum* sp. and *Deschampsia caespitosa*. Twenty new populations of this species were mapped in the project area, ranging in size from several plants to large colonies.

Stebbins' monardella (*Monardella stebbinsii*) -- Stebbins' monardella is an endemic to the NFFR canyon, known only from several occurrences here that are threatened by mining activities. This rare plant is found only on serpentine soils, most commonly on scree slopes of serpentine rock outcrops. It is a CNPS List 1B, perennial herb, flowering from July to August, and is readily identified by its clumped growth form and dense, felt-like hairs. A known population in the vicinity is found along Caribou Road on relatively barren, east-facing scree slopes of serpentine in association with *Monardella odoratissima*, *Quercus chrysolepis*, *Toxicodendron diversilobum*, *Erigeron nudum*, and *Streptanthus* sp. GANDA botanists located six occurrences of *Monardella stebbinsii* in the NFFR corridor. Populations ranged in size from 5 to 20 individuals and were predominantly located on steep, inaccessible serpentine outcrops or scree slopes on the east bank of the river. These populations occur approximately 50 to 70 feet upslope from the high water mark.

Marsh skullcap (*Scutellaria galericulata*) -- This rare (CNPS List 2) perennial herb is on the USFS sensitive species list. It is in the mint family and blooms from June to September. Marsh skullcap is known in the region from marshy areas near Antelope Lake and an unconfirmed occurrence at Last Chance Marsh at the northwest tip of Lake Almanor. GANDA botanists also found it occurring abundantly at Last Chance Marsh, north of the Highway 36 bridge, in association with *Achillea millefolium*, *Carex vesicaria*, *Carex lanuginosa*, *Phleum* sp., and *Descampsia caespitosa*. Thirteen distinct occurrences were mapped in this area, concentrated at the mouth of an inlet along the Mud Creek Rim

on the east side of the marsh. Marsh skullcap was frequently found in association with *Lycopus uniflorus*, another rare mint. All populations in the project areas were previously unknown, and ranged in size from a few individuals to large colonies.

Feather River stonecrop (*Sedum albomarginatum*) --A CNPS List 1B, this endemic species of the Feather River drainage grows in the crevices of serpentine cliffs or talus piles within the serpentine foothill pine woodland plant community. Its flowering period is from June to September. It is known from less than twenty occurrences at Pulga Bridge, the Caribou Road area, and Rich Bar. However, the elevational range of these occurrences is broad: from 830 feet to 5,200 feet. *Sedum albomarginatum* tends to grow in association with other rare serpentine endemic plants, including *Arabis constancei* and *Senecio eurycephalus* var. *lewisrosei*. Populations are threatened by collecting, road construction, and mining. Common associate species include: *Quercus chrysolepis* var. *chrysolepis*, *Ceanothus cuneatus*, *Streptanthus tortuosus*, *Eriogonum nudum* var. *oblongifolia*, and *Phacelia corymbosa*. In the project area, known populations of Feather River stonecrop occur on the northeast side of Caribou Rd. one mile north of the Queen Lily Campground, within the river canyon, and along Caribou Road just south of the North Fork Campground. These three known populations, as well as four previously unknown populations, were located in the project area. All occurrences of this species are located between the mouth of Mosquito Creek and the Queen Lily Campground.

Flat-leaf bladderwort (*Utricularia intermedia*) – A rare aquatic bladderwort, *Utricularia intermedia* was recently added to the CNPS list as rare in California but common elsewhere, along with its congener *U. ochroleuca*. This CNPS list 2 and USFS Special Interest species is distinguished from the common bladderwort (*U. vulgaris*) by its flat leaf segments and a flower spur that projects forward. These unique plants have submerged, creeping stems held afloat by air bladders, which capture small aquatic organisms when entrance hairs are triggered. It is found in the shallow water of the Last Chance Marsh in dense mats, and occurs more frequently than *U. ochroleuca*, below. Four occurrences of this species were found in the project area, in association with *Carex vesicaria*, *Potamogeton* spp., *Polygonum amphibium*, etc. Populations are also in close proximity of two rare mints, *Lycopus uniflorus* and *Scutellaria galericulata*.

Cream-flowered bladderwort (*Utricularia ochroleuca*) – This USFS Special interest species was only recently found to occur in California; this species is not found in the Jepson Manual (Hickman 1993). It is distinguished from another special-status bladderwort in the project area, *U. intermedia*, by trap-bearing branches with small dissected leaves. The common species of bladderwort, *U. vulgaris*, is abundant at the Last Chance Marsh. Three populations of this species occurred in the project area, all in the Last Chance Marsh at the western tip of Lake Almanor. Associated species include *Carex vesicaria*, *Elodea canadensis*, and *Potamogeton* spp.

E3.3.4 Noxious Weeds in the Project Area

While exotic species are widespread in the project area and in California in general, there are particular species of concern to the California Department of Food & Agriculture (CDFA) for their invasiveness and potential to spread explosively. The CDFA areas of concern are rangelands and agricultural weeds. The California Exotic Pest Plant Council (CalEPPC) defines 'noxious weeds' as, "*aggressive pest plants that displace native plants and natural habitats.*" CalEPPC maintain a separate list from the CDFA for "Exotic Pest Plants of Greatest Ecological Concern in California" (CalEPPC 2000). Their information is based on input from CalEPPC members, land managers, and botanists throughout the state, and published research. It focuses on noxious weeds that are serious problems in wildlands, *e.g.*, natural areas that support native ecosystems, state, local, and national parks and forests, BLM lands, etc. Additionally, the USFS National Forest botanists compile a list of noxious weeds known, or suspected, to occur in their area.

To develop a list a candidate noxious weeds potentially occurring within the project area the Licensee's botanical consultant reviewed the noxious weed lists and occurrence records from the Lassen and Plumas National Forests, as well as the lists of both the CDFA and the CalEPPC. Appendix B of the consultant's survey report contains the candidate species list for the project area (Appendix E3.3-1).

Noxious weed surveys were performed throughout the project area in spring and summer of 2000, concurrent with project vegetation mapping and sensitive plant surveys. Table

3.3-4 is a list of the noxious weeds found in the project area. Occurrences of noxious weeds were mapped in the field onto USGS topos or, where possible coordinate positions were taken with a GPS unit. Generally, the rugged terrain in the river corridor limited satellite reception and prevented crews from collecting location data with the GPS unit.

Noxious weed occurrences in the project area are concentrated along access roads, around powerhouses and at recreation facilities due to regular contact with vectors such as vehicle and equipment tires. In addition, the canopy openings provided by access roads and facilities also aid in the establishment of weeds by allowing sunlight to enter the forest or woodland floor. In one case, for instance, both a rare plant (*Carex geyeri*) and a weed (*Hypericum perforatum*) have colonized the same forest gap created by recent logging in the area. Noxious weeds to varying degrees colonize virtually all Licensee facilities included in the scope of this relicensing. However, weeds are also found in low-use areas, such as at the northern tip of Lake Almanor, or in the lower river reaches near Highway 70. These infestations are likely introduced, and/or spread, by a combination of high flows or water levels, and by recreationists.

GANDA found and mapped 145 occurrences of eight noxious weed species within the project area (see Table E3.3-4). The locations of all noxious weeds identified during field surveys are included in the consultant's report of botanical surveys. The consultant's report is presented, in its entirety, in Appendix E3.3-1. Included in the list of project area occurrences is one occurrence of the CDFA A-rated spotted knapweed (*Centaurea*

maculosa) and three occurrences of the A-rated Dalmatian toadflax (*Linaria genistifolia* ssp. *dalmatica*).

Spotted knapweed, a highly invasive perennial in the Aster family, was found on the west side of the Highway 36 Bridge over the causeway arm of Lake Almanor. Past attempts have been made by both the USFS and the local Agriculture Commissioner's office to contain this population. However, surveys by GANDA found that the population has spread explosively into the adjacent meadow and pasture, where the population size is now estimated at approximately 300 plants.

Dalmatian toadflax is an ornamental perennial in the snapdragon family, native to the Mediterranean region that escaped cultivation and is now naturalized in many areas of California. GANDA discovered two populations at the edge of the marsh on the west shore of Lake Almanor, at the 4,510 feet elevation contour, near the gravel pit in the town of Chester. These populations are currently small, but have the potential to spread explosively if disturbed.

Table E3.3-2 List of Noxious Weeds Occurring in the Upper NFFR Project Area.

Scientific Name	IRPS List	CDFA List	Description
Cheat grass <i>Bromus tectorum</i>	A-1	C	Annual grass. Frequently found in open fields, along roads, and openings in sagebrush and chaparral. Common throughout the project area, particularly on access roads and around powerhouses and recreational facilities.
Hairy whitetop <i>Cardaria pubescens</i>	—	B	A vigorous perennial, spreads through root sprouting, favoring moderately moist, alkaline to saline soils. Found in disturbed open sites, grain fields, and orchards in the Sacramento Valley and Great Basin. Found in project area on the west side of Lake Almanor, near the 4,510 elevation contour. Also at the north end of Butt Valley Reservoir, and near Belden Forebay.
Spotted knapweed <i>Centaurea maculosa</i>	Red Alert	A	Highly competitive biennial weed, displaces native vegetation. Found in fields, roadsides, grasslands, and logged areas. Scattered throughout California. Found in the project area on the Highway 36 embankment on the west-side of the bridge over Lake Almanor.
Yellow star-thistle <i>Centaurea solstitialis</i>	A-1	C	Highly competitive annual considered one of the most serious rangeland weeds in the northwestern U.S.; displaces native vegetation. Common in open, disturbed sites, pastures, and woodlands. Common throughout the project area, particularly on access roads and around powerhouses and recreational facilities.
Canada thistle <i>Cirsium arvense</i>	B	B	Clump-forming perennial to one meter tall, forming dense patches of single-sex individuals. Colonizes roadsides, fields, and pastures. Scattered throughout California except the southern Sierra Nevada. In project area, Mud Creek Rim Road, east shore north end of Lake Almanor.
St. John's Wort, Klamathweed <i>Hypericum perforatum</i>	B	C	Erect perennial colonizing rangeland areas, pastures, roadsides, and forest clearings. Grows best in open sites on slightly acidic soils. Source of the herbal medicine St. Johnswort. Common in the northwestern U.S. Large occurrences at Butt Valley Reservoir, in the vicinity of special status plants. Common along roads, at facilities, and at recreational areas.
Dalmatian toadflax <i>Linaria genistifolia</i> ssp. <i>Dalmatica</i>	—	A	Escaped perennial ornamental colonizing disturbed open sites, fields, and grasslands throughout California. Considered a high priority for eradication by CDFA. Found on the west side of Lake Almanor colonizing the

Scientific Name	CEPPC List	CDFA List	Description
			edge of montane meadow habitats.
Bouncing-bet <i>Saponaria officinalis</i>	A-2	C	Erect perennial found in roadsides, oak woodlands, streambeds above the water line, and around towns and old homesites. Ranging throughout northern California. Found in the active scour zone near the confluence of the NFFR and East Branch NFFR.
Himalayan blackberry <i>Rubus discolor</i>	A-1	—	Not tracked by the USFS in study area. Impacts riparian and wetland areas, widespread throughout California and project area, difficult to map. Found in project primarily as intermittent band of riparian vegetation on the NFFR from Seneca, to Belden Powerhouse.

¹ California Exotic Pest Plant Council Lists: A-1 = Most Invasive Wildland Pest Plants: Widespread; B = Wildland Pest Plants of Lesser Invasiveness; Need More Information = Species' status is uncertain; more information is needed. Red Alert = Pest plants with the potential to spread explosively.

² California Department of Food and Agriculture Lists: A = The agency mandates that these species be targeted for eradication or containment; B = These species are more widespread and, therefore, difficult to contain and the agency allows county Agricultural Commissioners to decide whether to target them for eradication or containment in their jurisdictions; C = These weeds are so widespread that the agency does not endorse state- or county-funded eradication or containment efforts except in nurseries or seed lots.

A third occurrence of Dalmatian toadflax was found on the northern embankment of the Highway 36 Bridge over the causeway arm of Lake Almanor, on the west side. This occurrence is also small, but has potential to spread into the adjacent montane meadow and pasture.

Two very small occurrences of Hairy whitetop (*Cardaria pubescens*) were also found in the area previously described in the vicinity of the gravel pit near Chester. These occurrences are in a residential/industrial area far from any Licensee facilities and are some distance away from the lakeshore. Livestock grazing in these areas has the potential to spread these pests.

An occurrence of the B-rated Canada thistle (*Cirsium arvense*) was found on the Mud Creek Rim Road, on the east shore of the northern tip of Lake Almanor. This occurrence is already at nearly 50 plants and appears to be spreading vigorously. Road maintenance could potentially spread this infestation. Similarly, recreationists driving on the road could spread the plants to new locations in the vicinity.

Other noxious weed species found in the project area include: klamathweed (*Hypericum perforatum*), cheat grass (*Bromus tectorum*), yellow star-thistle (*Centaurea solstitialis*), bouncing-bet (*Saponaria officinalis*) and Himalayan blackberry. These weeds are so widespread in California that eradication or control is considered unlikely.

E 3.3.5 Impacts of Existing Project

Routine operation and maintenance of the Upper NFFR Project has a nominal effect on all existing upland and riparian/wetland plant community types found in the project area. Maintenance of roads and vegetation management around structures including buildings, powerhouses, switchyards, penstocks, dams, campgrounds, etc., requires annual and semi-annual removal of relatively small quantities of unwanted and hazardous vegetation. This type of vegetation removal occurs, for the most part, in areas of significant prior disturbance and may largely involve the removal of ruderal and other weedy plant species. Trimming of native woody shrubs and trees and removal of hazard trees occurs periodically along project roads and other linear project rights-of-ways throughout the project area for purposes of maintenance and fire risk management.

None of the documented occurrences of special status plants in the project area are threatened by continued hydroelectric operations or facilities maintenance. Most of the occurrences found were in more or less remote areas away from either roads, facilities, or areas with fluctuating water levels. Some special status plants found in the Last Chance Marsh area, northern arm of Lake Almanor, could be impacted by significant changes in reservoir operating levels. No such changes have been proposed.

Noxious weeds could potentially threaten a few populations of sensitive species such as *Clarkia stellata* and *Lupinus dalesiae* in the vicinity of Butt Valley Reservoir where Klamath weed is particularly common.

Eight species of noxious weeds were found distributed virtually throughout the project area but were somewhat less prominent around the shoreline of Lake Almanor. Most occurrences are believed to be the result of introduction via vehicle tires into the project area; however, both Klamath weed and bouncing-bet were found in riparian corridors suggesting that further dissemination of these seeds may occur by water.

E3.3.6 Agency Recommended Measures

All agency consultation letters and Licensee responses are provided in Report E-9.

E3.3.7 Licensee Proposed Measures

Licensee proposes to design and implement a resource management plan for the causeway area of Lake Almanor, from Last Chance Campground south along the west shore of the lake to approximately the northern edge of the flood control channel south of the Chester airport. The purpose of this plan is the protection of a variety of sensitive biological resources including populations of *Scutellaria galericulata*, *Lycopus uniiflorus*, *Drosera rotundifolia*, and *Utricularia ochroleuca*. Other sensitive resources in this area include wetlands, streamside riparian communities, sensitive wildlife habitats, and cultural resources.

The resource management plan will examine current land use and project-related operational effects in arriving at specific protection measures for the Licensee fee title lands. At a minimum, the plan will examine opportunities for resource enhancement through modifications to grazing practices, controlling off-road vehicle traffic, limited

controlled recreation access, and control of noxious weed populations throughout the management area. Licensee proposes to develop this plan in consultation with state and federal resources agencies and other interested non-governmental organizations.

Design of new recreational developments and expansion of existing developments will include measures for protection of sensitive plant populations and control/prevention of noxious weeds.

E3.3.8 Anticipated Impacts of Continued Operation

No significant adverse impact to rare, threatened, or endangered plants or USFS sensitive plants will occur as a result of the continued operation of the project's hydroelectric power generation facilities. Some native or introduced naturalized vegetation will be affected by continued routine maintenance of project facilities including roads and other linear rights-of-ways.

Further development of public recreation facilities including expansion of existing facilities has been proposed over much of the project including various shoreline locations at Lake Almanor, Butt Valley Reservoir, and Belden Forebay. Detailed specifications for these proposed developments are still in preparation by the Licensee. However, based upon the preliminary descriptions provided in section E 5.0 of this draft application, future recreation developments could potentially impact known populations of sensitive plants occurring in shoreline areas of Lake Almanor and Butt Valley Reservoir, and could encourage further spread of noxious weed populations in these

areas. However, as stated earlier, measures will be implemented at each of the recreation developments for the protection of sensitive plant populations and the control/prevention of noxious weeds.

E3.3.9 Literature Cited for Botanical Resources

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