



Swainson's hawks were historically found throughout most of lowland California (Grinnell and Miller 1944). Swainson's hawks use a variety of agricultural crops for foraging: alfalfa, fallow fields, beet, tomato, irrigated pasture, rice (non-flooded), and cereal grains. The current distribution of the species is limited to northeast California (primarily Modoc, Siskiyou, and Lassen counties) and the Central Valley. The species' decline is believed to be related to agricultural and urban land conversions (Estep 1989).

A nesting pair of Swainson's hawks was discovered during the course of the relicensing studies (DWR 2004c). This pair nested annually from 2002 through 2006 in a thin strip of mature riparian habitat within the OWA adjacent to the Feather River. This nest produced at least one young during each breeding season. Foraging activity occurred primarily in a young walnut orchard adjacent to the FERC Project boundary. No other sightings of adult Swainson's hawks were made at any other location within the FERC Project boundary.

Greater Sandhill Crane. Both the lesser and greater subspecies of sandhill crane winter in the Central Valley of California and may be found within the project area. The greater sandhill crane subspecies is State listed as Threatened and is considered a Sensitive species by Region 5 of USFS.

Wintering crane habitat consists of an open expanse of shallow water for communal roosting, rice or corn fields for foraging, and irrigated pasture for loafing (DFG 1992). No nesting sandhill cranes are found within the study area. Survey data indicate that a limited amount of marginally suitable sandhill crane wintering habitat is present within the FERC Project boundary around Thermalito Afterbay. Furthermore, survey results indicate that greater sandhill crane use of the habitat within the FERC Project boundary and adjacent agricultural habitats is at best uncommon (DWR 2004c).

Bank Swallow. DFG listed the bank swallow as a Threatened species in March 1989. Bank swallows are found in riverine habitat and require a sandy or silty vertical bluff or riverbank for nesting (Zeiner et al. 1990a). Floods or very high flows are required to create and maintain the eroded banks favored by this migratory, colonial species.

No bank swallow nest colonies were identified within the project area. However, surveys conducted on the Feather River downstream of the project area in 2002 and 2003 identified 8 and 15 active colonies, respectively (DWR 2004g). The total number of burrows in active colonies was 2,274 in 2002 and 3,594 in 2003 (DWR 2004c).

American Peregrine Falcon. USFWS listed the American peregrine falcon as an Endangered species under FESA in 1970; DFG subsequently listed the species as Endangered under CESA. USFWS recently de-listed peregrine falcons, but they remain State listed. The breeding population of peregrine falcons in California has increased from 2 known active nest locations in 1970 to more than 250 nesting pairs in 2006.

Three active peregrine nest locations were identified within the study area during the 2002, 2003, 2004, 2005, and 2006 breeding seasons. Two of these locations had been

used historically. Between 2002 and 2005, the same two nest territories were occupied and fledged a collective minimum of three young per year. Pre-fledglings were salvaged by DFG after they fell or flew from one of the nest sites in 2003 and again in 2004. These chicks later fledged at another location and are not included in the production data. The newly documented nest territory was the only territory where incubation behavior was not observed. This production of 1.0 young per active nest and 1.5 young per occupied nest compare favorably with statewide production data collected between 1975 and 1988, which averaged 0.83 young per active nest and 1.04 young per occupied nest (Jurek 1989). However, the goal of 1.5 young per pair included in the *Pacific Coast Recovery Plan for the American Peregrine Falcon* (USFWS 1982) was not met during 2002, 2003, 2004, or 2005.

### Other Special-Status Species

This section includes a brief overview of other special-status wildlife species, including State Species of Concern, State Fully Protected Species, Federal Species of Concern, and USFS and BLM Sensitive Species (see Table 4.5-4). Of the 57 remaining species presented in Table 4.5-4, the majority of the species are California Species of Special Concern. These numbers reflect species status as of February 2006.

Per stakeholder direction during the study plan report development process, no specific surveys were conducted for these species on a project-wide basis. However, all sightings of these species during the course of other relicensing wildlife studies were recorded and entered into a Geographic Information System (GIS) database. Further, more intensive surveys of all federal lands in the project area were completed for USFS and BLM Sensitive Species. The project area is outside of the elevational range of California spotted owl, mountain yellow-legged frog, and northern goshawk. Of the 54 special-status species included on Table 4.5.4 with the potential to occur within the project vicinity, 25 species were observed within or adjacent to the project area (Table 4.5-5).

American white pelican, double-crested cormorant, and osprey observations were most common with 180–597 individual records. Least frequently observed species include Barrow's goldeneye, western burrowing owl, and short-eared owl. Additional information on special-status species locations and observed habitat use is included in Chapter 14 of the SP-T2 report (DWR 2004c). Many of the special-status species observed in the project area are believed to breed within the project vicinity (Table 4.5-5).

**Table 4.5-5. Special-status species observed within or adjacent to the project area.**

Species	Believed to Breed within the Project Area?
American white pelican	Yes
Barrow's goldeneye	No
Black tern	No
Black-crowned night heron	Yes
California gull	No
Caspian tern	No
Common loon	No
Cooper's hawk	Yes
Double-crested cormorant	No
Foothill yellow-legged frog	Yes
Golden eagle	Yes
Lewis's woodpecker	Yes
Loggerhead shrike	Yes
Long-billed curlew	No
Northern harrier	Yes
Northwestern pond turtle	Yes
Osprey	Yes
Prairie falcon	Yes
Sharp-shinned hawk	Yes
Short-eared owl	Yes
Tricolored blackbird	Yes
Western burrowing owl	Yes
White-faced ibis	Yes
Yellow-breasted chat	Yes
Yellow warbler	No

Source: DWR 2004c

### **Existing Project Conditions**

Existing project operations could cause direct and indirect effects on special-status wildlife species and habitats within the project area. Short- and long-term effects may result in changes to the dynamics and stability of existing wildlife communities, including changes in species diversity and wildlife distribution, and may affect reproductive success. Direct and indirect effects may result from the following:

- *Lake Oroville Water Level Fluctuations.* Water levels in Lake Oroville fluctuate in response to needs for flood management, water quality and temperature needs, environmental commitments, and as a result of water withdrawals for irrigation or municipal water use. Long-term population monitoring of nesting bald eagles on Shasta Lake indicates a positive correlation between bald eagle productivity (number of young produced per occupied nest) and the average water surface elevation between April and June (U.S. Bureau of Reclamation 1992). A similar relationship may occur on Lake Oroville. However, the limited information available about bald eagle reproduction on Lake Oroville does not allow meaningful evaluation.

- *Thermalito Afterbay Water Level Fluctuations.* Relatively minor water level fluctuations occur at the Diversion Pool and Thermalito Forebay, and within dredger ponds associated with the OWA. However, Thermalito Afterbay water level fluctuations are more extreme and can adversely affect the habitat of the highly aquatic giant garter snake. Mudflats that are exposed during some Thermalito Afterbay fluctuations may increase predation and loss of individual giant garter snakes that attempt to traverse these areas to reach either shoreline cover or aquatic foraging areas.
- *Ground/Soil Disturbance and Habitat Degradation from Operations and Maintenance Activities.* Project maintenance and/or operations may affect habitats of species listed under FESA and/or CESA by disturbing surfaces, resulting in direct elimination of habitat, degradation of habitat quality, and/or displacement of wildlife. Federally listed vernal pool tadpole and fairy shrimp are sensitive to sedimentation, drainage control, and herbicides associated with road and levee maintenance activities (see Appendix E of the PDEA [DWR 2005]). Valley elderberry longhorn beetles and their habitats are sensitive to facilities maintenance activities including grading, pruning, herbicide use, and pesticide use (Appendix E of the PDEA [DWR 2005]).
- *Disturbance from Project-Related Recreation.* Wildlife and wildlife habitat may be directly and indirectly affected by project-related recreation. Development and use of recreational facilities causes direct loss of habitat as vegetation is removed or altered and soil is disturbed as described in the report for SP-T9, Recreation and Wildlife (DWR 2004h). Bald eagles can be intolerant of human activity during the breeding season. However, tolerance to human activity varies from pair to pair. Human activity can result in nest abandonment and subsequent loss of production (Bogener 1980; Detrich 1980; Lehman 1983).

In some cases, breeding bald eagles have relocated their nests in response to human activity (Thelander 1973). Recreational off-highway vehicle use can damage vernal pools by disrupting overland flow patterns and directly destroying habitat (DWR 2004c). The weight of a vehicle can crush or displace fairy and tadpole shrimp present during the wet season or destroy their cysts in the summer. The compacted soils in the resulting tire ruts are unsuitable for sustainability of the vernal pool ecology, affecting the growth of aquatic plants and algae.

## **4.5.2 Botanical**

### ***4.5.2.1 Botanical Resources***

#### **Overview**

This section describes the affected environment as it relates to botanical resources, including vegetation communities, invasive non-native plant species, and special-status plants, and analyzes the baseline effects on these resources.

Botanical resources in the project area are influenced by a variety of factors. Vegetation patterns correspond with elevational changes and are dependent on precipitation, temperature, soils, aspect, slope, and disturbance history. Unique geologic and geomorphic conditions exist within the project area and affect plant habitats and species. The primary parent rock types around Lake Oroville are granitic, volcanic, metamorphic, and sedimentary. Unique formations include serpentine outcrops located within the West Branch and Big Bend area of the North Fork arm of the reservoir and gabbro-derived soils located along the South Fork arm. Vernal pools and swale complexes are a common part of the valley grassland habitats below Lake Oroville. These pools are of the Northern Hardpan type that occurs in areas of hummocky ground on terrace-alluvial derived Redding soils (DFG 1998). These formations tend to support a number of endemic and rare plant species.

Operation of the Oroville Facilities influences environmental conditions within and around Lake Oroville, its upstream tributaries, areas in and around the Thermalito Complex, and the OWA, as well as the Feather River floodplain below the project area. In general, the environmental effects on botanical resources of the Oroville Facilities may occur from (1) reservoir operations and water releases; (2) timing, magnitude, frequency, and duration of water level fluctuations; (3) facility maintenance or development; (4) vegetation and/or wildlife habitat management; (5) noxious weed management; (6) road maintenance and development; and (7) recreational use or development and/or maintenance associated with recreation areas. These are the principal actions that were used to analyze potential effects on botanical resources.

Botanical field investigations included surveys for vegetation mapping, invasive weeds, special-status plant species, and riparian and wetland resources. Surveys were conducted during 2002, 2003, and 2004. Please refer to each study plan report for more detailed information.

#### **Vegetation Associations/Communities within the Project Area—Existing Conditions**

The study area for the vegetation community/land use mapping included the FERC Project boundary, a 1-mile area beyond the FERC Project boundary, and the Feather River floodplain (within the Federal Emergency Management Area [FEMA] 100-year floodplain) downstream of the FERC Project boundary. Vegetation community/land use types and acreages are identified in Table 4.5-6. Maps depicting the vegetation

communities may be found in Figures 4.5.2-1 and 4.5.2-1a through 4.5.2-1j. A comprehensive vegetative communities/land use map was developed based on field surveys and aerial photography.

**Table 4.5-6. Vegetation/land use within the study area.**

Community Type	FERC Project Boundary		1 Mile Outside FERC Project Boundary		Feather River Floodplain	
	Acres	%	Acres	%	Acres	%
Upland Forest/Woodland	11,101	27	62,145	62	64	<1
Upland Herbaceous	2,752	7	12,218	12	2,661	8
Upland Shrub/Scrub	232	<1	2,289	2	0	0
Agriculture	126	<1	10,063	10	16,174	51
Disturbed/Urban/Bare	2,328	5	10,333	10	3,084	8
Riparian Forest/Woodland	3,238	8	1,043	1	4,269	13
Riparian Shrub/Scrub	215	<1	286	<1	2,175	7
Wetland	912	2	348	<1	210	<1
Open Water	19,796	48	767	<1	3,151	10
Aquatic/Submerged	443	1	33	<1	90	<1
<b>TOTALS</b>	<b>41,143</b>	<b>98</b>	<b>99,525</b>	<b>97</b>	<b>31,878</b>	<b>97</b>

Source: SP-T4

Vegetation communities are broad categories that represent an assemblage of similar vegetation association types. Vegetation associations are typically defined by dominant or co-dominant species and are based in part on the classification systems of Sawyer and Keeler-Wolf (1995) and Holland (1986). In total, seven natural vegetative community types were identified in the study area: upland forest/woodland, upland herbaceous, upland shrub/scrub, riparian forest/woodland, riparian shrub/scrub, wetlands, and aquatic/submerged vegetation. Other areas were mapped based on land uses such as disturbed, agriculture, urban or as rock outcrop, or open water (SP-T4). Nearly half (20,000 acres) of the 41,000 acres within the FERC Project boundary are surface waters. Discussion of these waters is not addressed here; however, plants that do inhabit backwaters and edges of these waters were mapped and are discussed under aquatic/submerged.

The majority of vegetation around Lake Oroville and the Diversion Pool consists of a variety of native vegetation associations including mixed oak woodlands, foothill pine/mixed oak woodlands, and oak/pine woodlands with a mosaic of chaparral. Open areas within the woodlands consist of annual grassland species. Below Oroville Dam and the Diversion Pool, vegetation around open waters of the Thermalito Complex consists of emergent wetland types with annual grasslands on the surrounding slopes. Open cottonwood riparian forests occur throughout much of the OWA, with mixed riparian and willow scrub near the Feather River.