

A.8 AMERICAN PEREGRINE FALCON (*FALCO PEREGRINUS ANATUM*)

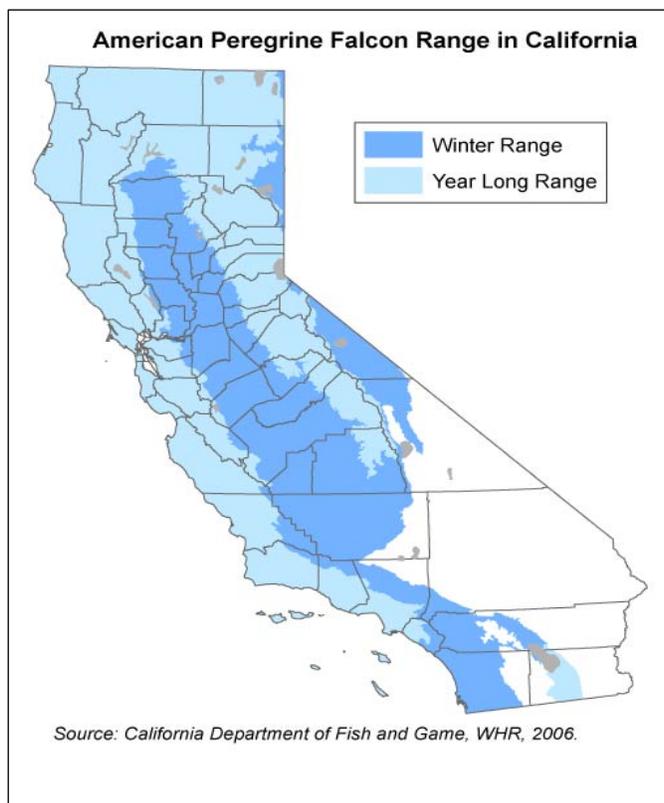
A.8.1 Legal and Other Status

The American peregrine falcon (*Falco peregrinus anatum*) was listed by the California Fish and Game Commission in 1971 as an endangered species under the California Endangered Species Act. In 2009, the California Fish and Game Commission voted to remove the American peregrine falcon from California's endangered species list. This was the second delisting of a species by the California Fish and Game Commission. Despite species recovery that has warranted delisting, the peregrine falcon remains a state Fully Protected species.



The peregrine falcon was initially listed under the precursor to the federal Endangered Species Act (ESA) in 1970 (35 FR 16047). Due to its recovery, the species was federally delisted by the U.S. Fish and Wildlife Service on August 25, 1999 (64 FR 46542). A post-delisting monitoring plan was implemented in 2003 (68 FR 67697), which requires monitoring every three years between 2003 and 2015 (USFWS 2003a).

A.8.2 Species Distribution and Status



A.8.2.1 Range and Status

The peregrine falcon has the most extensive natural distribution of any bird in the world, limited primarily by high elevations and extreme temperatures. It is found on all continents except Antarctica. There are three subspecies nesting in North America:

The Arctic peregrine falcon (*F. p. tundrius*) nests on the north slope of Alaska east across northern Canada to Greenland, and winters in Latin America. The Peale's peregrine falcon (*F. p. pealei*) is a year-round resident on the coasts of Washington, British Columbia, and Alaska north to the Aleutian Islands. The American peregrine falcon nests in southern Alaska, Canada, the United States

and northern Mexico (64 FR 46542, White et al. 2002) and is the only subspecies that breeds in California (Wheeler 2003).

The American peregrine falcon occurs throughout much of North America, from the subarctic boreal forests of Alaska and Canada south to Mexico. It nests from central Alaska, central Yukon Territory, and northern Alberta and Saskatchewan, east to the Maritime Provinces, and south (excluding coastal areas north of the Columbia River in Washington and British Columbia) throughout western Canada and the United States to Baja California, Sonora, and the highlands of central Mexico (64 FR 46542). While distributed widely, it nests in low densities with an estimated historical population of approximately 4,000 breeding pairs (64 FR 46542, White et al. 2002).

The species declined precipitously in North America following World War II, a decline attributed largely to organochlorine pesticides, mainly DDT (dichlorodiphenyltrichloroethane), applied in the United States, Canada, and Mexico. During the 1940s, 1950s, and 1960s, eggshell thinning and nesting failures (a result of ingesting prey contaminated with DDE, a metabolite of DDT, which prevents normal calcium deposition during eggshell formation) were widespread in Peregrine falcons, and in some areas, successful reproduction virtually ceased. As a result, there was a slow but drastic decline in the number of peregrine falcons in most areas of its range in North America. By 1975, there was no reported breeding in the eastern population and only 324 known nesting pairs in the west (64 FR 46542, White et al. 2002, Wheeler 2003).

As a result of this decline, the species was listed as endangered on June 2, 1970, under the precursor of the Endangered Species Act (35 FR 16047). Following restrictions on organochlorine pesticides in the United States and Canada, and implementation of various management actions, including the release of approximately 6,000 captive-reared falcons, recovery goals were substantially exceeded in some areas, resulting in the federal delisting of the species in 1999 (64 FR 46542).

Post-delisting monitoring results continue to indicate recovery of the species. Estimates of territory occupancy, nest success, and productivity were above the target values that were set in the post-delisting monitoring plan for those nesting parameters (USFWS 2003b). Data collected during 2003 indicate that there were 3,005 nesting pairs of American peregrine falcons in the United States, Canada, and Mexico in 2003, compared to approximately 1,750 pairs at the time of delisting.

Prior to the 1940s, approximately 200 breeding pairs were thought to occur in California; however, only limited accurate information was available. By the mid-1970s, only two pairs were known to breed in the state. Since the implementation of recovery efforts, 271 active breeding sites have been documented. Surveys conducted in 2006 by the Santa Cruz Predatory Research Group revealed that of the 236 sites visited, 167 had at least one adult present and 154 were confirmed to have an active pair present (www2.ucsc.edu/scpbrg/pefacensus.htm).

A.8.2.2 Distribution and Status in the Plan Area

While there are no reports of peregrine falcon in Butte County in the California Natural Diversity Database (CNDDB 2007; see Figure A.8-1, *American Peregrine Falcon Modeled Habitat and Recorded Occurrences*), peregrine falcons are known to occur, and possibly breed, along the eastern edge or just east of the eastern Plan Area boundary. A relatively substantial amount of peregrine falcon activity has been reported by state agencies and local experts from within the Plan Area. Altacal Audubon Society reports a breeding pair in upper Butte Creek Canyon, as well as recent activity in the Upper Bidwell Park area and on a suspension bridge across Lake Oroville. The California Department of Fish and Game (DFG) reports a nest site along the southern bluffs of Upper Bidwell Park. DFG also reports activity along the western bluffs of DFG's Table Mountain Ecological Reserve. The California Department of Water Resources (DWR) reports nest sites on three of the four bridges over Lake Oroville. These and other reports of peregrine falcon activity will be refined and updated through additional contact with local biologists.

A.8.3 Habitat Requirements and Special Considerations

A.8.3.1 Nesting

Nesting habitat is variable throughout the species' range. Throughout the species range, including California, most traditional sites are associated with cliffs and generally open landscapes for foraging. Often associated with water, nests are often situated along rivers, lakes, or coastal shorelines. Cliff sites range from 26 to 1,312 feet (8 to 400 meters [m]) high with most between 164 to 656 feet (50 to 200 m) (Bond 1946). A variety of atypical sites in artificial habitats have been reported, particularly for reintroduced pairs since the 1970s, including towers, buildings, and bridges, sometimes in urban environments (Bell et al. 1996, Cade et al. 1996). Trees and abandoned nests of other raptors are also occasionally used. Nest sites have been reported to occur at more than 9,842 feet (3,000 m), but most are below 3,936 (1,200 m) (White et al. 2002, Wheeler 2003).

The placement and orientation of nests is variable depending on climactic and habitat features. Most cliff sites are nearly vertical and provide protection from mammalian predators. Cliff sites that offer updrafts are generally preferred, likely due to accessibility to and from the site. Thermoregulation may also be a key factor related to maximizing solar radiation while providing cover during extreme temperatures (White et al. 2002, Wheeler et al. 2003).

Cliff nests are typically on ledges and in small shallow caves. Eggs are laid in "scrapes," which are shallow indentations the adults scratch out with their talons in the soft earth on the floor of their nest site (64 FR 46542).

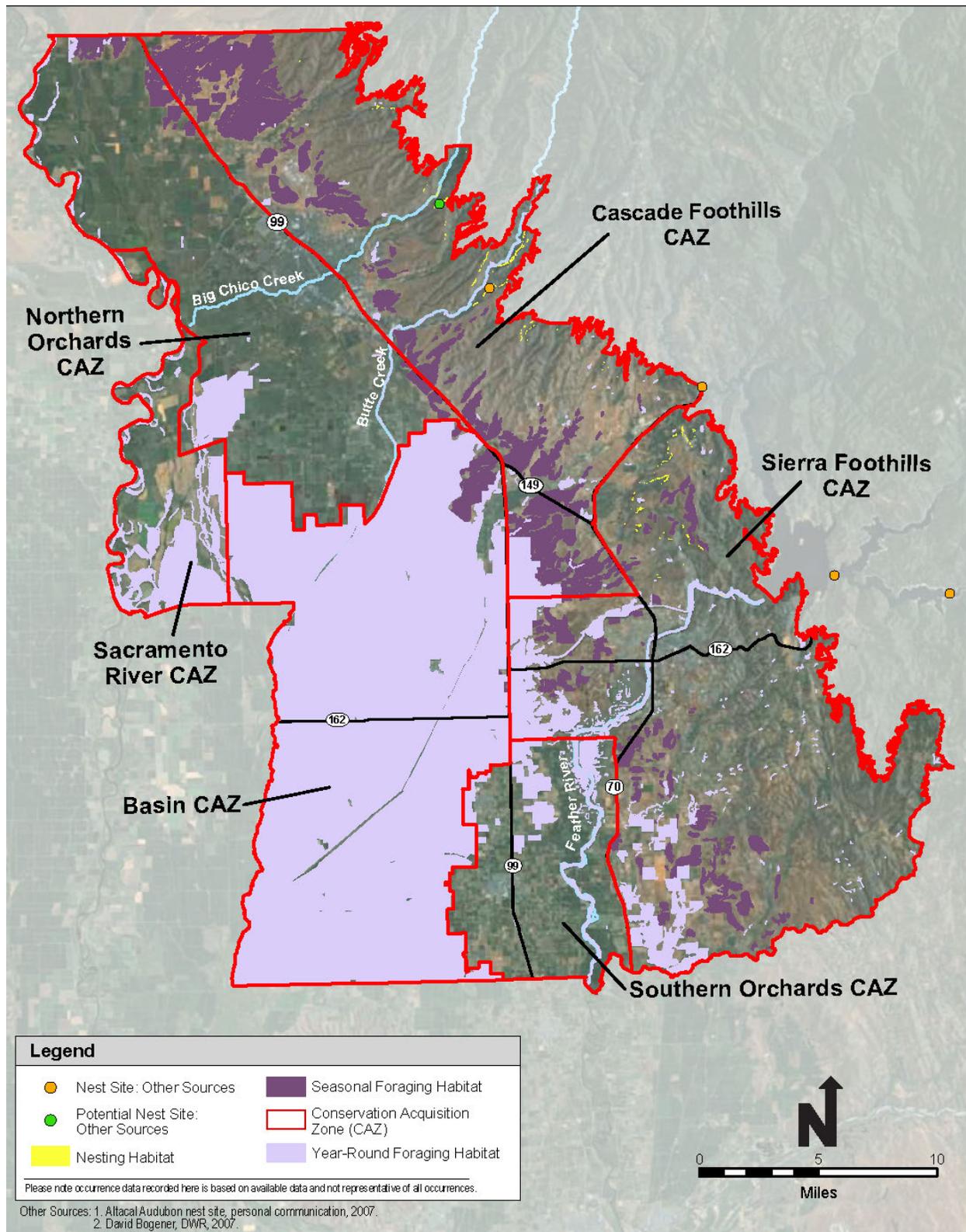


Figure A.8-1. American Peregrine Falcon Modeled Habitat and Recorded Occurrences

A.8.3.2 Foraging

Nest sites are usually selected based on available foraging opportunities. Foraging habitat consists of open water (e.g., lakes, reservoirs, estuaries, rivers, and oceans), marshes, mudflats, and tidal zones where shorebirds and other water birds congregate, or pasturelands with potholes or vernal pools that provide habitat for waterfowl and other water birds. Urban nesting falcons may forage within the urban environment on rock doves or other urbanized species.

A.8.4 Life History

A.8.4.1 Seasonal Patterns

American peregrine falcons that nest in subarctic areas generally winter in South America and may migrate through California during the fall and spring months. Those that nest at lower latitudes, including California, exhibit variable migratory behavior; some do not migrate. In northern California, some breeding pairs remain at or in the vicinity of the nest year-round, while others migrate locally to more favorable winter foraging habitats (White et al. 2002, Wheeler 2003).

A.8.4.2 Reproduction

Peregrine falcons exhibit a high degree of mate and site fidelity. In Northern California, courtship generally begins in February/March and eggs are typically laid in late April to early May. From three to five eggs are laid and incubated by the female and male for 33 to 37 days. Hatching occurs from late May to early June and fledging occurs 35 to 42 days after hatching. Fledglings usually remain dependent on the adults for an additional 6 to 15 weeks, at which time they become independent (White et al. 2002, Wheeler 2003).

A.8.4.3 Foraging Behavior and Diet

American peregrine falcon forages almost exclusively on birds. Hunting either aerially or from a perch, avian prey are mainly captured in flight, often using a long-distance high-speed pursuit with angled or vertical dives. The diet consists of birds ranging from small passerines to medium-sized waterfowl. In addition to shorebirds, grebes, ducks, and other water bird species, rock doves, starlings, other songbirds, bats, and occasionally other small mammals are taken (Wheeler 2003). The peregrine falcon is also known to take insects. In many areas, Columbiforms comprise the largest component of their diet (Sherrod 1978).

A.8.4.4 Foraging Ranges

Foraging range is largely a function of prey availability and is thus highly variable. DFG (1989) reports that peregrine falcons in California have been reported to travel more than 12 miles (19.3 kilometers [km]) from the nest to hunt. Enderson and Kirven (1983) reported an average foraging distance of 3 miles (5 km) in the northern California study area. Zeiner (1990) reports

home range sizes in California averaging 125 square miles (324 square km), which is generally consistent with Enderson and Craig (1997) who reported a range of 138 to 408 square miles (358 to 1,058 square km) in Colorado.

A.8.5 Threats

While the effects of organochlorides persist to some extent and may continue to pose reproductive problems, the risk is significantly reduced since the banning of DDT.

Other potential threats to nesting peregrine falcons include urbanization resulting in the loss of foraging habitats and disturbance to nest sites; illegal shooting, egg collecting, and falconry activities; and collision with vehicles, utility lines, and other structures.

While the extent of peregrine falcon activity reported from the Plan Area has certainly increased since the beginning of recovery efforts, development activities and land use changes could potentially pose a threat to this local population. Urbanization of bluffs and ridges could alter available habitat or increase levels of human disturbance. However, peregrine falcons in many areas along the East Coast have become well established in urban areas (Cade et al. 1996), achieving high densities and productivity rates similar to rural areas (Gahbauer 2009). Loss of wetland habitats within the Plan Area and the resulting reduction of available waterbird prey could affect foraging opportunities for peregrine falcon.

A.8.6 Relevant Conservation Efforts

The widespread use of organochloride pesticides, especially DDT, was a primary cause of the decline in peregrine falcon populations (USFWS 1982). This threat has been reduced since the banning of DDT. The peregrine falcon is a covered species or a proposed covered species in several regional conservation plans in the Central Valley region of California. These include the South Sacramento County Habitat Conservation Plan, the Placer County Conservation Plan, and the Yolo County Natural Heritage Program Plan.

A.8.7 Species Habitat Suitability Model

A.8.7.1 Nesting Habitat

Peregrine falcon nesting habitat includes cliff faces and rock outcrops with a minimum slope of 50 degrees.

A.8.7.1.1 Assumptions

The only available breeding habitat for peregrine falcons within the Plan Area occurs on cliffs along the eastern edge of the Plan Area, where there are two known nest sites in the Plan Area, and three known nest sites east of the Plan Area boundary. Most peregrine falcon cliff nest sites are nearly vertical and are between 50 and 200 meters high (164 to 656 feet) (Bond 1946, White

et al. 2002). Due to limited availability of higher resolution digital elevation model (DEM) data for the Plan Area, it was not possible to capture all of the cliff features as described above. However, using a 10-meter DEM with a slope threshold of 50 degrees, cross-referenced against USGS (1 to 24,000) topographic maps, the model captures a good spatial representation of peregrine falcon cliff breeding habitat in the Plan Area.

A.8.7.2 Seasonal Foraging Habitat

Peregrine falcon seasonal foraging habitat is defined as grassland with vernal swale complex, and vernal pools or altered vernal pools contained by grassland with vernal swale complex within the entire Plan Area.

A.8.7.2.1 Assumptions

Peregrine falcons prey on waterfowl, shorebirds, and other birds that may use vernal pools. Vernal pools typically fill during November and dry by May. For purposes of this model, all suitable foraging habitat within the Plan Area is assumed to be within the foraging range of peregrine falcons nesting along the eastern edge of the Plan Area (DFG 1989).

A.8.7.3 Year-Round Foraging Habitat

Peregrine falcon year-round foraging habitat includes managed wetland, emergent wetland, rice, and open water land cover types within the entire Plan Area.

A.8.7.3.1 Assumptions

Peregrine falcons occupy the Plan Area during the winter season, which extends approximately from October through February and during the breeding season, which extends approximately from March through September. The land cover types that support year-round foraging habitat are those which provide year-round habitat for wetland-associated birds (e.g., waterfowl, shorebirds) that are important peregrine falcon prey species.

A.8.8 Recovery Plan Goals

This species has been delisted by both USFWS and DFG. Banning the use of DDT improved the nesting success of wild peregrine falcons. Recovery of the species was also aided by captive breeding and reintroduction efforts. Current recovery tasks include the continued measuring of pesticide levels and the monitoring of peregrine falcon nesting success.

A.8.9 References

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Personal Communications

Altacal Audubon. 2007. Nest site locations.

David Bogener, Staff Environmental Scientist. California Department of Water Resources. 2007. Nest site locations.

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