

American Peregrine Falcon (*Falco peregrinus anatum*)

Legal Status

Federal: Delisted.

State: Endangered, Fully Protected.



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Global and State Conservation Status: G4T3S2: Global rank, G4 = Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors; T rank Same as global rank but related only to the status of the subspecies throughout its range, T3 = Vulnerable: At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors; State rank, S2 = Imperiled: Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.

Recovery Plan: The U.S. Fish and Wildlife Service prepared a Recovery Plan for the Peregrine Falcon (Pacific population) (*Falco peregrinus anatum*) in 1982 (USFWS 1982).

Species Description and Life History

The American peregrine falcon (*Falco peregrinus anatum*) is a medium to large falcon with males measuring 36-49 cm and females measuring 45-58 cm in total length (White *et al.* 2002). Adults have bluish-grey upperparts and whitish, grayish, or buffy with variable amount of blackish spotting and barring underparts (White *et al.* 2002). Undersides of wings and tail are barred pale gray and black (White *et al.* 2002). A variable-width, blackish facial stripe extends down from the eyes across malar (malar strip or moustache) (White *et al.* 2002). This stripe is usually offset by pale auriculars or “cheek” (White *et al.* 2002). Immature falcons are similar but upperparts vary from pale to slate or chocolate brown and underparts buffy with blackish streaks (White *et al.* 2002). Males and females are identical in appearance, but can be distinguished by size with females typically 15–20% larger and 40–50% heavier than males (Wheeler 2003, White *et al.* 2002).

Seasonal Patterns

Many breeding pairs in California remain at or in the vicinity of the nesting grounds year-round, while others migrate locally to more favorable winter foraging habitats (Wheeler 2003, White *et al.* 2002). The tundra subspecies (*F. p. tundrius*) and northern

populations of American peregrine falcon migrate south through California to and from breeding and wintering areas.

Reproduction

The breeding season of the American peregrine falcon generally extends from early March to late August (Polite and Pratt 1999). A month or two after courtship begins, females normally lay four eggs (range of 3–5) (USFS 2008). In southern California, the first egg is usually laid mid- to late February (White et al. 2002). In northern California, the first egg is usually laid in May (White et al. 2002). Both sexes incubate eggs and incubation typically takes 29-33 days (USFS 2008). In California, fledging occurs in late May to early June when the young are 35-42 days old (USFS 2008). Juveniles become independent 6-15 weeks after fledging. Nesting success in a healthy population ranged from 47-80% with successful pairs fledging 2.2 to 2.5 young (Monk 1981). Pairs may lay a second clutch if eggs are destroyed or removed early in the breeding season (Polite and Pratt 1999).

Peregrine falcons are relatively long-lived with a record of 19 years, 3 months (USGS 2002). First year survival is not well known but has been assumed to be 40-50% (White et al. 2002). Based on several studies, adult survival of peregrine falcon populations in the U.S. has ranged 69–100% (White et al. 2002).

Home Range/Territory Size

Home range sizes vary greatly by location, fluctuating primarily due to prey abundance (Polite and Pratt 1999). In the Rocky Mountains, home range included the area encompassed by a radius up to 23 km (14 mi) from nests (Polite and Pratt 1999). In northern California, 47% of females had hunting flights within home range greater than 1 km while 65% of males had hunting flights within home range greater than 1 km (0.6 mile) (Enderson and Kirven 1983). On average, individuals hunted 5 km (range of 3-8 km) from nest (Enderson and Kirven 1983). In Sonoma County, home range was approximately 320 km² (125 mi²) (Polite and Pratt 1999).

During the breeding season, adult peregrine falcons are territorial and will actively attack and chase other raptors away from the nest, especially golden eagles and other peregrine falcons (USFS 2008). Peregrine falcons use vocalization, visual displays, and physical contact to defend their territories (White et al. 2002). Territory sizes are probably a function of prey abundance (Nelson 1977). A minimum territory of 96 m (300 ft) radius around nests was recorded in Alaska (Cade 1960). Cade (1960) proposed a model that suggested a series of threshold perimeters around nesting sites. As distance from nest increases, defense decreases. Attacks always occur within the inner perimeter which may be only 200 m. In the outer perimeter, attacks only occur over food or favored perches. White and Cade (1971) reported that mean spacing between nests was 9.7 km (6 mi) along rivers in Alaska. Inland breeding sites in California varied in spacing, from 5-12 km (3-7 mi) (Polite and Pratt 1999).

Foraging Behavior and Diet

Peregrine falcons feed on a variety of birds and will occasionally take mammals, insects, and fish (Polite and Pratt 1999). They typically feed on highly mobile, flocking, and colonial nesting birds, such as shorebirds, waterfowl, doves, and pigeons (Johnsgard 1990). They will swoop from flight onto flying prey and chase in flight, but will rarely hunt from a perch (Polite and Pratt 1999). Hunting occurs during the day or at dusk (CDFG 1989).

Predation

Known predators of peregrine falcon include great horned owl (*Bubo virginianus*), golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), raccoon (*Procyon lotor*), and coyote (*Canus latrans*) (USFS 2008). However, predation is not known to substantially affect Peregrine Falcon at the population level (USFWS 1999). Peregrine falcons are known to compete with other raptors such as golden eagle, red-tailed hawk, and prairie falcon (*Falco mexicanus*) for cliff-nest sites (USFWS 1982).

Habitat Requirements and Ecology

Nesting

American peregrine falcons nest almost exclusively on protected ledges of high cliffs, primarily in woodland, forest, and coastal habitats (CDFG 1980, USFWS 1982). Nest sites usually provide a panoramic view of open country, are near water, and are associated with a local abundance of passerine, waterfowl, or shorebird prey (Johnsgard 1990). They have been reported to use man-made structures, such as tall buildings and bridges, and will occasionally use tree or snag cavities or old nests of other raptors (Polite and Pratt 1999).

Cliffs that provide ledges, potholes, or small caves (usually with an overhang), and that are relatively inaccessible to mammalian predators, are required components of nesting habitat (USFS 2008). Peregrine falcons prefer to nest near marshes, lakes, and rivers that support an abundance of birds, but they travel several miles from their nest sites to forage on pigeons, shorebirds, waterfowl, and songbirds (CDFG 1980, Grinnell and Miller 1944). In Utah, Porter and White (1973) reported that 19 nests averaged 5.3 km (3.3 mi) from the nearest foraging marsh, and 12.2 km (7.6 mi) from the nearest marsh over 130 ha (320 ac) in area. Peregrine falcons have been known to nest at elevations as high as 10,000 feet (3,048 meters), but most occupied nest sites are below 4,000 feet (1,200 meters) (Shimamoto and Airola 1981).

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. Falcons can forage on rice fields where shorebirds and water birds often occur, and may occasionally forage opportunistically over pastures. Coastal and inland marsh habitats are especially important to Peregrine Falcons in fall and winter because they attract large concentrations of waterbirds (CDFG 1980). Urban nesting falcons may forage within the urban environment on rock doves or other urbanized species.

Species Distribution and Population Trends

Distribution

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, United States and northern Mexico (White *et al.* 2002, USFWS 1999) 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 (USFWS 1999). While distributed widely, it nests in low densities with an estimated historical population of approximately 4,000 breeding pairs (White *et al.* 2002, USFWS 1999).

The California breeding range, which has been expanding, includes the central and southern California coast, inland northern coastal mountains, Klamath Mountains, Cascade Ranges, and Sierra Nevada (CDFG 2000). Although relatively uncommon, wintering birds can be seen throughout California (Zeiner *et al.* 1990). Historically, the American peregrine falcon occurred throughout most of California (USFWS 1982). Populations increase in winter with the arrival of migrating birds from the north (Grinnell and Miller 1944). Historically, American peregrine falcon nested throughout the state, with concentrations along the coast and around the Channel Islands (Grinnell and Miller 1944).

Population Trends

The peregrine falcon declined precipitously in North America following World War II, a decline attributed largely to organochlorine pesticides, mainly DDT, 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 (Wheeler 2003, White et al. 2002, USFWS 1999).

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 more exhaustive search efforts in conjunction with an intensive captive breeding and nest augmentation program (USFWS 1982), recovery goals were substantially exceeded in some areas, resulting in the Federal delisting of the species in 1999 (64 FR 46541) (Mesta *et al.* 1995, Cade *et al.* 1997), although this decision was controversial (Pagel *et al.* 1996, Pagel and Bell 1997).

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 2003a). 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 (USFWS 2003b).

Prior to the 1940s, between 100 and 200 breeding pairs were thought to occur in California; however, only limited accurate information was available. In 1969, fewer than 10 nesting sites were believed to be active (Herman *et al.* 1970), and 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).

Distribution and Population Trends in the Plan Area

There are no records of nesting Peregrine Falcons in Yolo County. Possible nesting habitat occurs only along the high elevation ridgelines in the western portion of the county. Prior to the inundation of Lake Berryessa in the 1950's, there was insufficient wetland or open water foraging habitat in the vicinity of this portion of the county to support nesting peregrine falcons. However, in 1999 a peregrine falcon nest was reported on the cliffs near Lake Berryessa, just west of the Yolo County line (CNDDDB 2007). Activity at the site has been reported in subsequent years (Madrone Online [<http://Audubon.sonoma.net/newsletter/v35n1.html>] and it is presumed extant. Additional possible nesting habitat exists along the western face of Rocky Ridge and Blue Ridge along the Yolo-Napa County line above Lake Berryessa.

This species is observed uncommonly, but regularly, in Yolo County during the winter. Observations have been reported primarily by local birders throughout the county, but mostly in areas that support wetland or open water habitats where waterfowl and shorebirds congregate, such as the Yolo Bypass Wildlife Refuge, Conaway Ranch, the Davis Sewage Treatment Ponds, Davis Wetlands, Roosevelt Ranch Reserve, and in flooded rice fields (Kemper 1999).

Threats to the Species and Other Conservation Issues

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. Other threats to the species include habitat loss and degradation, human disturbances, illegal shootings, trapping, egg-collecting, and collisions with stationary or moving objects such as buildings, electrical wires, or aircraft. (CDFG 1980, White *et al.* 2002).

There are few threats to peregrine falcons in Yolo County since there are no known nesting sites in the county. The Monticello Dam nesting pair could potentially be threatened by human disturbances. Suitable wintering foraging habitat may have increased in Yolo County over the last several years as a result of wetlands development at the Yolo Bypass Wildlife Area, Conaway Ranch, and the Roosevelt Ranch Preserve.

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References

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Cade, T.J. 1960. Ecology of the peregrine and gyrfalcon populations in Alaska. Univ. Calif. Publ. Zool. 63:151-290.

Cade, T.J., J.H. Enderson, L.F. Kiff, and C.M. White. 1997. Are there enough good data to justify delisting the American Peregrine Falcon? *Wildlife Society Bulletin* 25: 730–738.

California Department of Fish and Game (CDFG). 1980. At the crossroads: A report on the status of California's endangered and rare fish and wildlife. Revised 1983. Sacramento, CA.

- CDFG. 1989. Five-year status report: American Peregrine Falcon. Sacramento, CA: Nongame Bird and Mammal Section.
- CDFG (Ed.). 2000. The status of rare, threatened, and endangered animals and plants in California: American Peregrine Falcon. [Homepage of California Department of Fish and Game], [Online]. Available: http://www.dfg.ca.gov/hcpb/species/jsp/more_info.
- Enderson, J. H. and M. N. Kirven. 1983. Flights of nesting Peregrine Falcons recorded by telemetry. *Raptor Res.* 17: 33–37.
- Ferguson-Lees, J. and D.A. Christie. 2001. *Raptors of the world*. Boston: Houghton Mifflin Company.
- Grinnell, J. and A.H. Miller. 1944. The distribution of the birds of California. *Pacific Coast Avifauna* 27.
- Herman, S.G., M.N. Kirven, and R.W. Risebrough. 1970. The Peregrine Falcon decline in California. *Audubon Field Notes* 24: 609–613.
- Johnsgard, P.A. 1990. *Hawks, eagles, and falcons of North America*. Washington, DC: Smithsonian Institution Press.
- Mesta, R., T. Swem, and S. Lawrence. 1995. Advance notice of a proposal to remove the American Peregrine Falcon from the list of endangered and threatened wildlife. *50 Federal Register* 126: 34406–34409.
- Monk, G. 1981. California Peregrine Falcon reproductive outcome and management efforts in 1981. U.S. Dep. Inter., Fish and Wildl. Serv., Sacramento. *Endang. Spec. Rep.* 27pp.
- Nelson, R.W. 1977. Behavioral ecology of coastal Peregrines (*Falco peregrinus pealei*). Ph.D. diss., Univ. of Calgary, Calgary, AB.
- Pagel, J.E. and D.A. Bell. 1997. Reply to Cade et al. regarding de-listing the American Peregrine Falcon. *Wildlife Society Bulletin* 25: 739–742.
- Pagel, J.E., D.A. Bell, and B.E. Norton. 1996. De-listing the American Peregrine Falcon: Is it premature? *Wildlife Society Bulletin* 24: 429–435.
- Polite, C. and J. Pratt. 1999. Peregrine Falcon (*Falco peregrinus*). California Wildlife Habitat Relationships System, California Department of Fish and Game, California Interagency Wildlife Task Group. Available on the Internet at: <http://www.dfg.ca.gov/whdab/cwhr/A043.html>.

- Porter, R.D. and C.M. White. 1973. The Peregrine Falcon in Utah, emphasizing ecology and competition with the Prairie Falcon. Brigham Young Univ. Sci. Bull. 18: 1-74.
- Shimamoto, K. and D.A. Airola, eds. 1981. Fish and wildlife habitat capability models and special habitat criteria for northeast zone national forests. USDA Forest Service, Modoc National Forest, CA.
- USDA Forest Service (USFS). 2008. Species Accounts: Animals. Available at: <http://www.fs.fed.us/r5/scfpr/projects/lmp/read.htm>.
- U.S. Fish and Wildlife Service (USFWS). 1982. Recovery plan for Peregrine Falcon (Pacific population). Prepared by the Pacific Coast American Peregrine Falcon Recovery Team.
- USFWS. 1999. Final rule to remove the American Peregrine Falcon from the federal list of endangered and threatened wildlife. 50 Federal Register 46542.
- U.S. Geological Survey (USGS) (Ed.). 2002. Longevity records of North American birds. [Homepage of Patuxent Wildlife Research Center], [Online]. Available: <http://www.pwrc.usgs.gov/bbl/homepage/longvrec.htm> [2002, March 28].
- Wheeler, B.K. 2003. Raptors of Western North America. Princeton University Press, Princeton, New Jersey.
- White, C.M., N.J. Clum, T.J. Cade, and W.G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/660doi:bna.660>.
- White, C.M. and T.J. Cade. 1971. Cliff-nesting raptors and ravens along the Colville River in arctic Alaska. Living Bird 10:107-150.
- Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1990. California's wildlife. Volume II: Birds. Sacramento, CA: California Department of Fish and Game.