

Prairie Falcon

(*Falco mexicanus*)

Legal Status

Federal: Bird of Conservation Concern.

State: None.



© George Hartwell

Global and State Conservation Status: G5S3: Global Rank, G5 = Secure: Common; widespread and abundant; State Rank, S3 = Vulnerable: Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

Recovery Plan: None.

Species Description and Life History

The prairie falcon (*Falco mexicanus*) is a large, pale brown falcon that ranges from 37 to 47 cm (14.6-18.5 inches) in total length (Steenhof 1998). Wingspan measures from 90 to 113 cm (35.4-44.5 inches) (Steenhof 1998). They have relatively large, squarish heads with black malar streaks and large dark eyes (Steenhof 1998). When perched, wing-tips fall short of tail-tip (Clark and Wheeler 1987). In flight, this species can be distinguished by distinctive dark axillaries and trailing edge of underwing-coverts, which contrast with light-colored underwing surface (Steenhof 1998). Sexes have similar plumage but males are smaller (Steenhof 1998).

Seasonal Patterns

In California, prairie falcons are uncommon year round residents (Polite and Pratt 2005). The prairie falcon has been described as more of a wanderer than a true migrant (Dunne *et al.* 1988). Nesting territories are established in late-February through March in most of the breeding range (Steenhof 1998). The breeding season extends from mid-February through mid-September, peaking between April and early August (Polite and Pratt 2005).

Seasonal movements are probably in response to changes in food availability throughout the year (Steenhof 1998). Populations breeding in the north will winter in California (Polite and Pratt 2005). Most of the species' southward movements occur between late August and late October, with the main return flight taking place in early March to late April (Steenhof 1998).

Reproduction

Nests consist of a scrape on sheltered ledges or in a pothole of a cliff overlooking a large, open area (Polite and Pratt 2005). Females incubate a clutch size of 3-6 (average 5) eggs (Polite and Pratt 2005) for about 29-31 days (Enderson 1964). The male feeds the female, rarely taking part in incubation duties (USFS 2008). After hatching, young are tended by both adults until they leave the nest at about 40 days of age (Baichich and Harrison 1997). Fledging success over 5 years for 135 nests averaged 3.2 young, ranging 0-5; 19% of the nests had 5 young (Walton 1977). Young begin to disperse in June and July (Polite and Pratt 2005). Prairie falcons may live as long as 13 to 20 years (Enderson 1969, Denton 1975).

Home Range/Territory Size

Prairie falcons forage over large areas during the breeding season (Steenhof 1998). In Wyoming, home range for a breeding pair was 26 km² (10 mi²) (Craighead and Craighead 1956). In southern California, home range size ranged from 31 to 78 km² (12 - 30 mi²) (Harmata *et al.* 1978); and in northern California from 34 to 389 km² (13 -150 mi²) (Haak 1982). Home ranges are often elongate and oriented in one direction, usually north, from the nest (Steenhof 1998). They do not use all the areas within their home range (Steenhof 1998). In Idaho, 90% of locations were confined to core use areas that included only 38% of the total range (Marzluff *et al.* 1997).

Territory and home range are probably the same (Polite and Pratt 2005). Prairie falcons defend a small area surrounding nest sites from conspecific and other intruders (USFS 2008). However, prairie falcons forage over large, undefended areas, and do not defend territories at all during winter (USFS 2008). In Utah, breeding territory was 5.7 to 6.5 km² (2.2 to 2.5 mi²) (Smith and Murphy 1973). Active nests have been recorded within 200 m (636 ft) of one another (Enderson 1964, Garrett and Mitchell 1973), in sites where individuals did not confront or see each other regularly. Therefore, relative orientation of potential nest site probably more important than actual distance from another potential site (Polite and Pratt 2005).

Foraging Behavior and Diet

Prairie falcons mainly prey on small mammals, some small birds, and reptiles (Polite and Pratt 2005). Prey abundance largely determines diet composition. In some areas, birds are the principal prey, in other areas it is mammals. In Yolo County, and throughout much of the interior Coast Ranges, California ground squirrel (*Spermophilus beecheyi*) is probably the principal prey; however, birds may be more important where they are abundant. Horned lark (*Eremophila alpestris*) is a particularly important prey item in California during the winter (Garrett and Mitchell 1973). Prairie falcons employ two main hunting strategies: one is to flush a prey item and fly along a route meant to conceal the prairie falcon until the last moment; the other is to patrol long distances close to the ground until it may surprise its quarry (Dunne *et al.* 1988). They may also dive from a perch with rapid pursuit (Polite and Pratt 2005). Nest robbing, kleptoparasitism, and

cannibalism are less common feeding behaviors observed among prairie falcons (Steenhof 1998).

Predation

Predation by other raptors accounted for 41 percent of fledgling mortality and 56 percent of all mortality in a population monitored in Idaho (USFS 2008). Great-horned owls (*Bubo virginianus*) were the primary cause of nestling mortality (n = 19) during the study, along with golden eagles (*Aquila chrysaetos*) (n = 2) (McFadzen and Marzluff 1996). Other terrestrial predators of prairie falcons include coyote (*Canis latrans*), and bobcat (*Felis rufus*) (Steenhof 1998). Prairie falcons are usually tolerant of turkey vultures (*Cathartes aura*), northern harriers (*Circus cyaneus*), sharp-shinned hawks (*Accipiter striatus*), and American kestrels (*Falco sparverius*) in the vicinity of their nest sites, but red-tailed hawks (*Buteo jamaicensis*), great-horned owls, and golden eagles generally trigger an aggressive response (USFS 2008). Peregrine Falcons (*Falco peregrinus*) are reported to attack (and sometimes kill) prairie falcons that enter their territory (Steenhof 1998).

Habitat Requirements and Ecology

Nesting

The breeding range of the prairie falcon includes open habitats at all elevations up to 3,350 m (11,000 ft) (Steenhof 1998). Prairie falcons inhabit shrub-steppe desert, open desert scrub, grassland, mixed shrub-grasslands, and alpine tundra (Garrett and Dunn 1981, Steenhof 1998). They will also occur near agricultural fields (Polite and Pratt 2005). Nest scrapes are typically on sheltered ledges or in potholes of a cliff overlooking a large, open area (Polite and Pratt 2005). Nests are usually on high vertical cliffs, but a variety of conditions are used including relatively small escarpments on sloping canyon walls. Recorded cliff heights range from 3 to 154 m (10 to 505 ft) (Allen 1987, Runde and Anderson 1986). Nearby water sources appear to be important. Denton (1975) reported 76% of eyries had water within 0.4 km (0.25 mi).

Foraging

Desert scrub and grasslands are preferred foraging habitats in southern California (Garrett and Dunn 1981). In the interior Coast Ranges, prairie falcons forage in grasslands, oak savannahs, seasonal wetlands, pasturelands, and occasionally in grain and hay fields. Prairie falcons most often capture prey in areas of low (<30 cm), sparse vegetation in Northern California (Haak 1982).

Species Distribution and Population Trends

Distribution

Prairie falcons breed from south-central British Columbia, Alberta, Saskatchewan, and western North Dakota south to Baja California, southern Arizona, New Mexico, and western and northern Texas (USFS 2008). Wintering areas extend from the breeding range in southern Canada south to Baja California and east into the northern states of Mexico (AOU 1998). In California, prairie falcons occur over the length of the state except the humid northwest coastal belt (Small 1994). They are considered an uncommon permanent resident in California, ranging from southeastern deserts northwest throughout the Central Valley and along the inner Coast Ranges and Sierra Nevada (Polite and Pratt 2005).

Population Trends

In 1979, the total North American prairie falcon population was estimated at 5,000-6,000 nesting pairs, based upon interviews with biologists from 17 states (USFS 2008). In the early 1980s, the total prairie falcon population was estimated at 13,000, based on Christmas Bird Count data (USFS 2008). Christmas Bird Count data (1959-1988) show a significant increasing trend for the species in North America (Steenhof 1998). Garret and Mitchell (1973), however, considered the California population to be in decline in 1973 based on low territory occupancy and on reproductive rates that were insufficient to maintain a stable population. Breeding Bird Survey data over the last 20 years (1980-2000) are insufficient to reach definitive conclusions regarding population trends in California (Sauer *et al.* 2001). Foraging habitat in the coastal valleys has been severely altered by development (USFS 2008).

Distribution and Population Trends in the Plan Area

Similar to the golden eagle, the nesting distribution for prairie falcon includes only the high elevation mountainous areas in the western portion of the County. CNDDDB documents two prairie falcon nest locations in Yolo County, both along the west-facing rock escarpment of Blue Ridge in the northwestern corner of the County. Both of these sites are presumed extant, and there are potentially others in the same general area of the County or nearby in adjacent counties. Prairie falcons are uncommonly, but regularly observed in the Cache Creek watershed year round. The species is also occasionally observed in Capay Valley and the grassland and savannah foothills along the western edge of the valley during the breeding season, and is occasionally observed throughout the County during winter. Winter sightings have been reported by birders and researchers from locations in various parts of the County (Wilkerson and Debban 1980, Kemper 1999, various volumes of Yolo Audubon Society's journal *The Burrowing Owl*, and Sacramento Audubon Society's journal *The Observer*).

Sustainability of the prairie falcon population in Yolo County will require protection of high elevation nesting sites and surrounding woodland, chaparral, and grassland foraging habitat in the western portion of the County.

Threats to the Species and Other Conservation Issues

Throughout their range, prairie falcons are susceptible to habitat loss and degradation of nesting and foraging sites. Prairie falcons can be adversely affected by large-scale agricultural development, especially in foraging areas with high densities of ground squirrels (USFS 2008). Much of the prime foraging area for prairie falcons has been lost to development on the coastal side of the San Gabriel Mountains south to the Mexican border (USFS 2008). Mining activities can destroy nest sites even though the species has been found to be somewhat tolerant of disturbance associated with energy development on foraging grounds (USFS 2008). Recreational activities, such as rock climbing, may cause nest abandonment (USFS 2008).

Falconry activities also threaten this species. The species is legally harvested in 19 states (USFS 2008). Falconers legally take an estimated 0.2 percent of the prairie falcon population each year, making it the second most commonly harvested raptor in the United States (Steenhof 1998).

The prairie falcon's diet of non-aquatic birds and rodents and reptiles helped it escape the widespread DDT-induced declines experienced by the peregrine falcon (USFS 2008). However, localized occurrences of egg shell thinning in prairie falcon eggs have been reported (Stephenson and Calcarone 1999).

In Yolo County, threats to prairie falcons are largely restricted to activities occurring in the mountainous areas on the western side of the County. Thus, habitat loss and conversion pose minimal current risk to this population. However, other human disturbances including a variety of recreational activities, pose a more realistic threat to prairie falcon breeding sites in Yolo County.

Contributors to this species account:

Jim Estep, Independent Biological Consultant
Ted Beedy, Independent Biological Consultant
John Sterling, HT Harvey & Associates
Mark Roll, TAIC

References

Photo Credit: Copyright © 2006 George W. Hartwell CAS

- Allen, G.T. 1987. Prairie Falcon aerie site characteristics and aerie use in North Dakota. *Condor* 89: 187-190.
- American Ornithologists' Union (AOU). 1983. Checklist of North American birds. 7th ed. Washington, DC: American Ornithologists' Union.
- Baicich, P.J. and C.J. O. Harrison. 1997. A guide to the nests, eggs, and nestlings of North American birds. 2d ed. San Diego, CA: Academic Press.
- Clark, W.S. and B.K. Wheeler. 1987. A field guide to hawks North America. Houghton Mifflin Co., Boston.
- Craighead, J.J., and F.C. Craighead, Jr. 1956. Hawks, owls and wildlife. Stackpole Books, Harrisburg, PA. 443pp.
- Denton, S.J. 1975. Status of Prairie Falcons breeding in Oregon. Master's thesis, Oregon State Univ., Corvallis.
- Dunne, P., D. Sibley and C. Sutton. 1988. Hawks in flight: the flight identification of North American raptors. Houghton Mifflon Co., Boston, MA.
- Enderson, J.H. 1964. A study of the Prairie Falcon in the central Rocky Mountain region. *Auk* 81: 332-352.
- Enderson, J.H. 1969. Peregrine and Prairie Falcon life tables based on band-recovery data, Pp. 505-509 in *Peregrine Falcon populations: their biology and decline* (J.J. Hickey, ed.). Univ. of Wisconsin Press, Madison.
- Kemper, J. 1999. *Birding Northern California*. Falcon Press.
- Garrett, K. and J. Dunn. 1981. *Birds of southern California*. Los Angeles, CA: Los Angeles Audubon Soc.
- Garrett, R.L. and D.J. Mitchell. 1973. A study of Prairie Falcon populations in California. *Wildl. Manage. Branch Admin. Rep. no. 73-2*. Calif. Dep. Fish and Game.
- Haak, B.A. 1982. Foraging ecology of Prairie Falcons in northern California. Master's thesis, Oregon State Univ., Corvallis.
- Harmata, A.R., J.E. Durr and H. Geduldig. 1978. Home range, activity patterns and habitat use of Prairie Falcons nesting in the Mojave Desert. Unpubl. rep., Colorado Wildl. Services, Fort Collins, CO for U.S. Dep. Inter., Bur. Land Manage., Riverside, CA. (Contract No. YA-512-CT8-4389).

- Marzluff, J.M., B.A. Kimsey, L.S. Schueck, M.E. McFadzen, M.S. Vekasy and J.C. Bednarz. 1997. The influence of habitat, prey abundance, sex, and breeding success on the ranging behavior of Prairie Falcons. *Condor* 99: 567–584.
- Polite, C. and J. Pratt. 2005. Prairie Falcon (*Falco mexicanus*). 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>.
- Runde D.E. and S.H. Anderson. 1986. Characteristics of cliffs and nest sites used by breeding Prairie Falcons. *Raptor Research* 20: 21-28.
- Sauer, J.R., J.E. Hines, and J. Fallon. 2001. The North American breeding bird survey, results and analysis 1966-2000. Version 2001.2. Laurel, MD: U.S. Geological Survey Patuxent Wildlife Research Center. [Online]. Available: <http://www.pwrc.usgs.gov/>
- Small, A. 1994. The birds of California. New York: Collier Books.
- Smith, D.G. and J.R. Murphy. 1973. Breeding ecology of raptors in the eastern Great Basin of Utah. *Brigham Young Univ. Sci. Bull., Biol. Ser.* 18: 1–76.
- Steenhof, K. 1998. Prairie Falcon (*Falco mexicanus*), 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/346> doi:bna.346
- Stephenson, J.R. and G.M. Calcarone. 1999. Southern California mountains and foothills assessment: Habitat and species conservation issues. General Technical Report GTR-PSW-172. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture.
- USDA Forest Service (USFS). 2008. Species Accounts: Animals. Available at: <http://www.fs.fed.us/r5/scfpr/projects/lmp/read.htm>.
- Wilkinson G.S. and K.R. Debban. 1980. Habitat preferences of wintering diurnal raptors in the Sacramento Valley. *Western Birds* 11:25-34.
- Walton, B.J. 1977. Development of techniques for raptor management with emphasis on the peregrine falcon. Calif. Dep. Fish and Game, Sacramento. Admin. Rep. 77-4. 26pp.