

PRAIRIE FALCON

Falco mexicanus

Original¹ prepared by John M. Cooper

Species Information

Taxonomy

The Prairie Falcon is placed in the family Falconidae, along with caracaras, forest falcons, and other true falcons (Sibley 2001). In British Columbia, this family is represented by five species of true falcons (genus *Falco*): American Kestrel (*F. sparverius*), Merlin (*F. columbarius*), Peregrine Falcon (*F. peregrinus*), Gyrfalcon (*F. rusticolus*), and Prairie Falcon (*F. mexicanus*) (Campbell et al. 1990). There are no recognized subspecies of Prairie Falcon (AOU 1957; Cannings 1998).

Description

The Prairie Falcon has cryptic plumage which makes it less conspicuous in the grassland and cliff habitats it inhabits. Its back and dorsal wing surfaces are pale brown, while its ventral surface is mostly cream coloured with dark streaks on the chest and underwings. In contrast, the axillary feathers form a very dark triangle on each underwing that are distinctive to this species and are easily seen from below when the bird is in flight. Its facial pattern includes a narrow moustachial and ear covert stripe. Like other true falcons, Prairie Falcons have long, narrow, pointed wings. Prairie Falcons are 40–50 cm in length with a wingspan of about 100 cm. In general, they are slightly smaller and lighter in colour, and have fewer distinct facial markings than the closely related Peregrine Falcon.

Distribution

Global

Prairie Falcons breed from central British Columbia, southern Alberta and Saskatchewan, south to Baja California, Arizona, New Mexico, Texas, and

Northern Mexico. They winter throughout their breeding range as well as east to the Mississippi and south to Central Mexico (AOU 1957; Howell and Webb 1995; Steenhof 1998).

British Columbia

Prairie Falcons breed locally in the Southern Interior ecoprovince, and along the Fraser and Chilcotin rivers of the southern Central Interior ecoprovince (Campbell et al. 1990). Small numbers may also breed in the Boundary region and in the East Kootenay Trench (Cooper 1998; Fraser et al. 1999).

After the breeding season the population is more widely scattered, although the majority of birds probably shift south, with many birds leaving the province (Campbell et al. 1990).

Forest region and districts

Southern Interior: 100 Mile House,* Arrow Boundary, Cascades,*² Central Cariboo,* Chilcotin,* Kamloops,* Kootenay Lake, Okanagan Shuswap,* Rocky Mountain

Ecoprovinces and ecosections

CEI: CAP, CAB, CHP, FRB
SIM: EKT³ (SCM, MCR wintering only)
SOI: GUU, NIB, NOB, OKR, SHB, SOB, SOH, STU, THB, TRU

Biogeoclimatic units

AT
BG: xh1, xh2, xh3, xw, xw1, xw2
ICH: (dw, mw2, xw – wintering only)
IDF: dk1, dk2, dk3, dk4, dm1, mw1, mw2, xh1a, xh2a, xm, xw
MS: xk

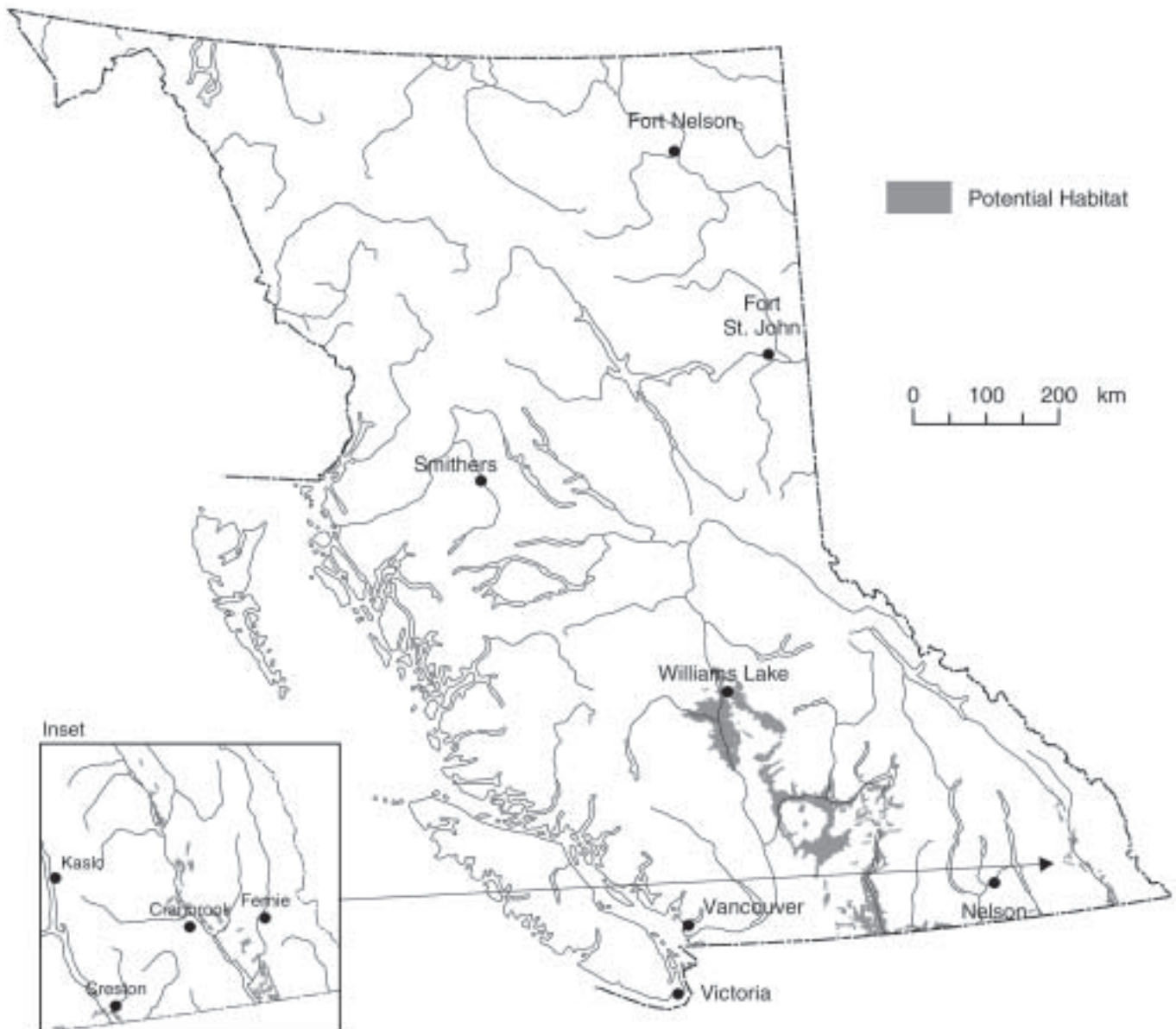
1 Volume 1 account prepared by M. Sarell.

2 * Indicates breeding.

3 Possible breeding.

Prairie Falcon

(*Falco mexicanus*)



Note: This map represents a broad view of the distribution of potential habitat used by this species. The map is based on several ecosystem classifications (Ecoregion, Biogeoclimatic and Broad Ecosystem Inventory) as well as current knowledge of the species' habitat preferences. This species may or may not occur in all areas indicated.

PP: dh1, dh2, xh1, xh2

SBPS: xc

Broad ecosystem units

Breeding: AB, BS, ME, RO, SS (DF, DP, PP – steep south facing slopes only)

Non-breeding: AB, BS, CF, CR, ME, SS, (DF, DP, PP – in seral stage 1 only)

Elevation

In British Columbia, nesting has been documented from 450 to 900 m elevation (Campbell et al. 1990). There are unconfirmed reports of nesting close to 2000 m elevation. In the non-breeding season, this species has been recorded from sea level to 2440 m (Campbell et al. 1990).

Life History

Diet and foraging behaviour

Prairie Falcons primarily prey on small- to medium-sized birds, including the Mourning Dove (*Zenaidura macroura*), Horned Lark (*Eremophila alpestris*), Western Meadowlark (*Sturnella neglecta*), and Vesper Sparrow (*Pooecetes gramineus*), and small mammals such as yellow-pine chipmunks (*Tamias amoenus*), ground squirrels, and the Yellow-bellied Marmot (*Marmota flaviventris*) (Cannings et al. 1987; Hunt 1993; Hooper and Cooper 1997). They also take small reptiles and insects, especially grasshoppers, although these likely constitute a smaller percentage of their diet.

Prey is typically caught on the ground with the falcon using its considerable speed to surprise and subdue its prey (Beebe 1974).

Reproduction

In the spring, Prairie Falcons return to their breeding grounds and pairs are typically reunited although, in areas with high densities, mate switching has been documented (Beebe 1974). Following a courting period involving aerial displays by the male, nesting may begin as early as late March, however late April is more common in British Columbia (Beebe 1974; Campbell et al. 1990). Records for 3 clutches from British Columbia had 3–4 eggs (Campbell et al. 1990). Elsewhere,

clutches of 3–6 eggs have been recorded, with 4–5 being most common (Baicich and Harrison 1997). The female does almost all of the incubating while the male feeds her, although the male may occasionally relieve her while she hunts (Beebe 1974; Call 1978). Incubation begins with the first egg laid and lasts from 29 to 33 days (Campbell et al. 1990; Baicich and Harrison 1997). Nestlings leave the nest after about 40 days. Young are fed by adults and may remain in the vicinity of the nest site for a variable amount of time after fledging (Beebe 1974; Cannings et al. 1987).

Prairie Falcons typically begin breeding at 2 years of age, although there are records of breeding in 1-year-old birds. One brood is raised annually.

Site fidelity

Prairie Falcons demonstrate a high degree of site fidelity at breeding areas and are often known to reuse the same site for several successive seasons and possibly for several generations (Lehman et al. 2000). Though nest sites are often reused, falcons may also use alternate nest sites within their breeding territory over successive seasons (Call 1978; Steenhof 1998). In one study of a prairie falcon population in Idaho the adult males sometimes moved to alternate aeries that averaged 1.5 km from previously used aeries (Lehman et al. 2000).

Prairie Falcons are solitary breeders although they may occur in higher densities in areas with abundant food supplies and nest sites. The densest known breeding concentrations are along the Snake River in southwestern Idaho, where up to 206 breeding pairs have been found along 130 km of river valley (Steenhof et al. 1999). In the Chilcotin-Cariboo region of British Columbia, there were an estimated one pair per 6 linear kilometres of cliff face (Hooper and Cooper 1997), but this estimate was based on very scant data.

Home range

No data are available for home range size in British Columbia. Elsewhere, birds have been recorded travelling up to 26 km from their nest site in search of food.

Migration is not well defined. Some birds remain in breeding areas year round; however, Prairie Falcons appear to leave areas with low food supply in the winter (although dispersal is not necessarily to the south) (Campbell et al. 1990). Young birds may also wander more extensively than mature adults (Beebe 1974).

There may be seasonal altitudinal movement, with falcons moving to higher altitudes in the late summer, post-fledging, where prey may be more accessible relative to their breeding areas (Beebe 1974). There are relatively numerous records in British Columbia of Prairie Falcons in alpine areas during August and September relative to other seasons (Cooper 1989; Campbell et al. 1990)

Habitat

Structural stage

- 1: non-vegetated
- 2: herb
- 3: shrub/herb

Important habitats and habitat features

Foraging

During the breeding season, Prairie Falcons usually hunt over grasslands and sagebrush steppe habitat near the aerie. Prairie Falcons require ample, accessible prey near the nest site. Because prey is usually taken on the ground, open areas (i.e., grassland habitat) are important to their forage success. Open areas with relatively low density, patchy vegetation provide suitable forage for small mammals and birds and opportunities for the falcons to access their prey.

Nesting

Extensive open areas such as grasslands and sagebrush steppe habitat, with an abundant prey base

and suitable cliffs for nesting are important breeding habitats (Cannings et al. 1987; Campbell et al. 1990).

Aeries are located in cliff faces, usually on a shelf, within a small cave or in a pothole in the cliff face (Baicich and Harrison 1997). An overhang over the nest is required, presumably to protect the nest from sun (Beebe 1974). Nest height from the base of the cliff in British Columbia ranges from 15 to 138 m (Campbell et al. 1990). Nests are almost always on rocky substrates, rarely on earthen banks, and consist of a shallow scrape (Call 1978; Baicich and Harrison 1997; Hooper and Cooper 1997). This species is also known to reuse abandoned cliff nests built with sticks by other raptors, but does not build stick nests itself (Baicich and Harrison 1997). Nests are usually near (0–6 km) open country.

Migration

Habitat requirements are probably similar to breeding season, although smaller open habitats, and habitats away from cliffs are used. Within British Columbia, alpine areas also appear to be used during the fall migration (Campbell et al. 1990).

Wintering

Open country with a sufficient prey base is required for populations wintering in British Columbia. Wintering birds occur regularly in small numbers near Kamloops and in the Okanagan Valley (Campbell et al. 1990).

Conservation and Management

Status

The Prairie Falcon is on the provincial *Red List* in British Columbia. In Canada, it is considered to be *Not At Risk* (COSEWIC 2002).

Summary of ABI status in BC and adjacent jurisdictions (NatureServe Explorer 2002)

AB	BC	ID	MT	OR	WA	Canada	Global
S3B, S2N	S2B, SZN	S5B, S3N	S4	S4	S3B, S3N	N3B, N3N	G5

Trends

Population trends

Historic population sizes are not well known, but it is generally believed that numbers in British Columbia are near all-time lows (Cooper 1998; Fraser et al. 1999). Many of the known, historic aeries are no longer occupied. Population size issues are further complicated by migration patterns that result in overlapping populations of wintering, migrating, and resident birds.

In British Columbia the Prairie Falcon population may have reached a peak in the 1920s when this species began to expand and occupy former Peregrine Falcon aeries. Peregrine Falcons were in decline at that time in southern British Columbia (Campbell et al. 1990). A similar situation occurred to some extent throughout the Prairie Falcon's entire North American range (Beebe 1974). By the 1940s, the Prairie Falcon population in the Okanagan was declining (Cannings et al. 1987) and, although data are limited, it seems likely that the same was happening across the province (Campbell et al. 1990). By the 1980s, the Okanagan Valley population appeared to be increasing (Cannings et al. 1987), perhaps in response to better wildlife management practices and positive effects from the ban on DDT use. However, the population in British Columbia may now have stabilized at an historic low (Cooper 1998; Hobbs 2001). In the rest of Canada, populations are currently thought to be increasing or stable (Kirk and Banasch 1996)

In general, population trends are difficult to determine because densities are too low for breeding bird survey results to yield significant data. In the United States, Christmas bird count data indicate that wintering populations there are stable (Platt and Enderson 1989). Nest area surveys are considered the only effective monitoring technique, but are expensive and labour intensive (see Hobbs 2000, 2001), and therefore have not been done on a large scale across the range (Fuller 1997; Hooper and Cooper 1997). One well-studied breeding population in the Snake River of southwestern Idaho, however, is known to have declined significantly from 1976 to 1997 (Steenhof et al. 1999).

Habitat trends

Foraging habitat near many traditional aeries has been altered (Fraser et al. 1999). Conversion of grassland and sagebrush foraging habitat to agricultural lands has reduced habitat availability in many areas (Cooper 1998). In the south Okanagan, developments have altered >60% of the grassland and shrub habitats, and only 9% remains in a relatively undisturbed state (MELP, no date). Since then, in the past 3 years, the amount of steppe habitat adjacent to the last regularly used aerie in the south Okanagan has been reduced significantly by a new vineyard. In addition, the amount of suitable breeding habitat available in British Columbia has been reduced and degraded by human activities (Fraser et al. 1999). Urban or industrial sprawl has encroached to the base of some former nesting cliffs (Cooper 1998).

Threats

Population threats

The Prairie Falcon population in British Columbia was probably impacted by the use of DDT in the province, with the decline in breeding pairs coinciding with the introduction of this pesticide (Cannings et al. 1987; Risebrough and Monk 1987). Although DDT is no longer being used in British Columbia, or elsewhere in Canada and the United States, there are residual organochlorines in the ecosystem, and falcons may also be exposed to pesticides on their wintering grounds if they leave the region (Risebrough and Monk 1987; Banasch et al. 1993). Furthermore, some prey species are migratory birds, and likewise may become contaminated with pesticides on their wintering ground (Banasch et al. 1993; Fraser et al. 1999). Renewed use of organochlorines or other biocides poses the greatest potential future threat for this species (Platt and Enderson 1989).

Other threats to the population include reduction of nesting productivity due to loss of productive hunting grounds through conversion to agriculture or urban sprawl (Cooper 1998). Availability of prey has been well documented as a critical factor for productivity of raptors (Garton et al. 1989). Prey availability in British Columbia may have been

reduced through persecution of ground squirrels, an important food item during the breeding season (MELP, no date). In Idaho, annual breeding productivity was closely linked with ground squirrel abundance, but no long-term trends correlated with ground squirrel abundance (Steenhof et al. 1999). Weather, in the form of droughts, affected ground squirrel abundance, and was therefore the causal mechanism for lower annual productivity (Steenhof et al. 1999). In Alberta, increasing amounts of land used for agriculture along the Bow River, and the correlated loss of ground squirrel populations were thought to be the likely cause of a declining occupancy rate of Prairie Falcon aeries (Hunt and Holroyd, pers. comm. in Kirk and Banasch 1996).

Human disturbance at aeries can lead to abandonment of nests and the long-term avoidance of traditional nesting cliffs (Campbell et al. 1990). Disturbance could be caused by recreational activities (e.g., rock climbing) or other land use practices (e.g., timber harvest near nest sites; Hobbs 2001). Disturbance due to intensive military training exercises in foraging areas in Idaho has proven to reduce foraging success by Prairie Falcons and is correlated with lower productivity (Steenhof 1998).

Harvest by falconers may be an ongoing threat, but is tightly regulated by government, and some studies have shown that controlled harvests do not affect populations (Platt and Enderson 1989). Shooting is unlikely to pose a current threat to populations, although in the past, extermination programs throughout the Prairie Falcon's range undoubtedly had an impact on historic populations (Cannings et al. 1987).

Habitat threats

Currently in British Columbia, the primary threat to this species is loss of foraging habitat near aeries, primarily through conversion of grassland and sagebrush steppe to agricultural land (Campbell et al. 1990; Hooper and Cooper 1997; Fraser et al. 1999). Fire suppression and subsequent forest encroachment into grassland also reduce suitable foraging areas (Cooper 1998; Hobbs 2001). For example, grassland habitats in the Chilcotin- Cariboo

region of British Columbia have been reduced by 30% in the last 30 years (Hooper and Pitt 1995). Invasion by exotic plants into native grasslands may negatively impact prey abundance and availability for Prairie Falcons (Steenhof et al. 1999).

Elsewhere, lack of availability of suitable nest sites near adequate prey supply are cited as the limiting factors for Prairie Falcon populations (Millsap et al. 1987).

Legal Protection and Habitat Conservation

The Prairie Falcon, its nests, and its eggs are protected from direct persecution in British Columbia under the provincial *Wildlife Act*.

In the Chilcotin-Cariboo region, three nest sites are within an existing wildlife habitat area (WHA) and another is in a provincial park (Hobbs 2001). Two historic Prairie Falcon aeries in the southern grasslands are in provincial parks, and one is protected within an ecological reserve (Hobbs 2000). One of these sites was active in 1995 but not in 2000 (Hobbs 2000), while the other has been taken over by Peregrine Falcons (Cooper 1998; Hobbs 2000).

Conservation of habitat on Crown land may be partially addressed by FRPA's range use guidelines. These include setting objectives for (1) "desired plant community" to promote Prairie Falcon prey species, (2) suitable livestock grazing levels in areas important for Prairie Falcons, (3) special conditions and practices to enhance habitat values for Prairie Falcons, and (4) provisions for limiting spread of invasive species.

Identified Wildlife Provisions

Wildlife habitat areas

Goal

Maintain suitable breeding habitat.

Feature

Establish WHAs at aeries active within the last 5 years.

Size

Approximately 300 ha but may vary depending on site-specific factors.

Design

Design will depend on natural features such as watercourses and contours, and other factors such as land tenure. In general, the shape of the WHA will reflect the best ecological protection possible of breeding and foraging habitats. The core area should be 300 m radius (~28 ha) around aerie (nest site). The management zone area will include the remaining area.

General wildlife measures

Goals

1. Minimize disturbance at breeding sites.
2. Maintain structural components of rangeland to enhance/maintain prey species and foraging opportunities for Prairie Falcons.
3. Maintain structural components of the forest edge including wildlife tree retention.
4. Minimize soil disturbance and invasion of invasive species.
5. Maintain suitable foraging habitat.
6. Prevent or control forest encroachment.

Measures

Access

- Do not construct roads within the core area.
- Do not construct roads or blast within the management zone area during the breeding season (15 March–30 July).

Harvesting and silviculture

- Do not harvest or salvage within the core area except for treatments to control forest encroachment.
- Do not harvest or salvage during the breeding season (15 March–30 July).
- Maintain a selection of mature trees (age class 6–9) and large snags largest within the stand, preferably of decay class 2–4.
- Maintain shrub patches.

Pesticides

- Do not use pesticides.

Range

- Plan livestock grazing (distribution, timing, intensity) to meet objectives described above (GWM goals).
- Delay burning or mowing of meadows near aeries (within 1 km radius of aerie) until after the breeding season (15 March–30 July).

Recreation

- Do not develop recreational trails, facilities, or structures within the core area.

Additional Management Considerations

MWLAP may need to build a co-operative relationship with landowners who own cliffs with aeries, or important grassland foraging habitat, to effectively conserve some individual breeding sites.

Areas near active aeries should be managed to minimize urbanization and negative impacts of disturbance by humans, vehicular traffic, and domestic animals, especially during the breeding season (15 March–30 July).

Incompatible human activities should be regulated within the WHA. These include plowing or tilling land, off-road vehicle use, camping, firewood cutting, and pesticide applications.

Information Needs

1. Status of historical breeding localities and inventory for new sites in areas that have not been surveyed recently, especially in the grasslands of the Thompson, lower Fraser, and Okanagan valleys; and the East Kootenays.
2. Impacts of urbanization and human recreational use of nesting areas on reproductive success.
3. Productivity of known breeding pairs.

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