

SPECIES ACCOUNT

Species Data

Common Name:	Flammulated Owl
Scientific Name:	<i>Otus flammeolus</i>
Species Code:	B-FLOW
BC Status:	Blue-listed
COSEWIC / SARA Status:	Special Concern



Project Data

Project Name:	Middle Shuswap River Sensitive Ecosystems Inventory
Project Type:	Terrestrial Ecosystem Mapping
Ecoprovince:	Southern Interior
Ecoregions:	Thompson-Okanagan Plateau
Ecosections:	Northern Okanagan Highland (NOH), Shuswap Highland (SHH)
BGC Units:	IDFmw1, ICHmw2
Map Scale:	1:20 000

Distribution

Provincial Range

Flammulated Owls are distributed throughout dry Douglas-fir forests of the southern interior of BC, from the Okanagan and Similkameen Valleys north to Alexis Creek, McLeese Lake and Riske Creek in the Fraser-Chilcotin valleys, and in the East Kootenays at least as far north as Radium Hot Springs (Cannings and van Woudenberg 2002). Breeding primarily occurs in the Okanagan and Thompson-Nicola regions of the Southern Interior, and the Fraser River from Lillooet to Williams Lake. The highest nesting densities occur in the Kamloops area (van Woudenberg 1999).

Elevation Range

Occur from 375 m to 1375 m elevation (Campbell et al. 1990, van Woudenberg et al. 1995).

Distribution in the Project Area

One record is known from the study area, west of Cherryville (H. Davis pers. comm.).

Ecology and Habitat Requirements

Flammulated Owls arrive in BC from their southern wintering areas from late April to early May, and generally leave from early September to mid-October (van Woudenberg 1999). Males often return first, and females follow and pair-bond with a male with an established territory. One or both of a pair may use the same nesting site in multiple years, sometimes in an alternate nest in the same tree or an alternate tree in the same foraging area (van Woudenberg 1999, Cannings and van Woudenberg 2002). Usually only one clutch is laid per year, and brood size is generally 2-3 young. Eggs are generally laid in June, but ranges from mid-May to late July (Campbell et al. 1990). Fledging usually occurs from mid-July through mid-August (Cannings and van Woudenberg 2002), but may occur later in colder weather or in mesic or cool-aspect sites (van Woudenberg 1999).

Flammulated Owls require a mixture of open and dense mature to old Douglas-fir forest, with dense thickets for security cover and open understorey or small openings for foraging (Williams et al. 1989).

As secondary cavity nesters, Flammulated Owls rely on natural cavities, or those excavated by Pileated Woodpeckers or Northern Flickers. Home range sizes in BC are roughly estimated to be 2.2 – 3.7 ha (van Woudenberg 1992), but have been recorded as large as 15.9 ha on average (McCallum 1994). Singing territories may initially encompass 20 hectares during the incubation period and then decrease to less than 10 hectares during the post-fledging period (Roberts and Roberts 1995). Foraging generally occurs within 300m of the nest site, but foraging distances of up to 586m have been recorded (Cannings and van Woudenberg 2002).

This species of owl is insectivorous, with the diet consisting mainly of larger insects of lepidoptera (butterflies and moths), orthoptera (grasshoppers and crickets) and coleoptera (beetles) (van Woudenberg 1999). Spruce budworm may be an important food source during outbreaks. Foraging strategies include hawking flying insects, and gleaning prey from vegetation.

The main predator of Flammulated Owls in BC is the Barred Owl, but also includes Sharp-shinned Hawk, Coyote, Black Bear, and even Northern Flying Squirrel and Red Squirrel (van Woudenberg 1999).

Reproducing (Egg-laying)

Security/Thermal Habitat

Mature and old, mixed-age Douglas-fir forest, with a multi-layered canopy, an understorey of grasses or low shrubs, thickets for security cover, and snags with cavities, is preferred nesting habitat for Flammulated Owls.

Nesting usually occurs in stands of well-spaced Douglas-fir of varying ages, with a general appearance of parkland, where the understorey is very open and consists of pinegrass, bluebunch wheatgrass, birch-leaved spirea and isolated larger shrubs such as saskatoon (Campbell et al. 1990b). The majority of nests have been located in the IDF biogeoclimatic zone, particularly the xeric subzones. All but four of the Flammulated Owl records in the south Okanagan (n=54) occurred in the IDFxh1 variant or at the boundary with PPxh1 (St. John 1991), and only one nest site has been found in the PPxh2 in the Kamloops area (van Woudenberg 1999). However, Flammulated Owls will use lower elevation, warmer and drier sites in wet cold years (van Woudenberg 1999).

Thickets of regenerating Douglas-fir, and veteran trees with heavy branching, provide security habitat around the nest, as well as for roosting and foraging (McCallum 1994, Cannings and van Woudenberg 2002). Flammulated Owls swoop into thickets and veteran trees for cover immediately after capturing prey on the wing in an adjacent opening (van Woudenberg 1992).

Flammulated Owls will use nest boxes, but generally rely on natural cavities or those excavated by Pileated Woodpecker or Northern Flicker in Douglas-fir, ponderosa pine or aspen. Snags are preferred over live trees; 91% of nest trees in Oregon were dead, and 75% of nest trees in BC were dead (Cannings and van Woudenberg 2002). Large diameter ponderosa pine snags are preferred nest trees, as they are more stable than smaller trees or other species (Cannings and van Woudenberg 2002). In BC, 67% of Flammulated Owl nests were in ponderosa pine, and 28% in Douglas-fir (van Woudenberg 1999). In Idaho, 17% of the Flammulated Owl nests were located in live aspens

(Powers et al. 1996), and half of all nests in Oregon were in aspen trees (van Woudenberg 1999). Although they may use aspen in a Douglas-fir stand, Flammulated Owls are not reported to use riparian habitats anywhere in North America (McCallum 1994).

Known nests in BC occurred in trees or snags at least 55 cm DBH (van Woudenberg et al. 1997). However, in the US, nests have been found in trees >30 cm DBH (Rodrick and Milner 1991).

In BC, nest trees are generally on moderate to steep slopes, with a range of about 10-70% (Williams et al. 1989, Christie and van Woudenberg 1997). Nests generally occupy mid- to upper-slope positions and are often associated with benches or ridges (van Woudenberg 1999). Although van Woudenberg (1992) found that north aspects had a higher frequency of nesting owls, no nests in the Kamloops area occurred on directly north aspects, and aspect varied between east and west in the Fraser River valley, and north and south along the Chilcotin River (van Woudenberg 1999). It is possible that warm aspects are preferred in cooler, mesic Douglas-fir forest, and cool aspects preferred in warmer, drier Douglas-fir/ponderosa pine forest.

Food

Owls hunt in grassy or partially shrubby openings for grasshoppers, crickets and beetles, and in the forest canopy for moths and caterpillars (van Woudenberg et al. 1997). During spruce budworm outbreaks, Flammulated Owl have been observed gleaning budworm larvae from the infested canopies of Douglas-fir thickets, and during non-outbreak periods and in drier habitat types they were observed foraging in small forest openings (van Woudenberg 1992). Food is found in open, mature, and old forests but also in early seral stages and in clearings and grasslands (Okanagan LRMP Species Notes 1995; Rodrick and Milner 1991). Furnis and Carolin (1980) reported that ponderosa pine and Douglas-fir forests have the highest diversity of butterflies and moths of all coniferous forest types.

Most sites in the Kamloops Forest District were grazed; this may create the open understory components needed in foraging habitat, by maintaining lower shrub cover, but may also reduce plant diversity and insect abundance (Williams et al. 1989). After grazing had reduced grasses to <10 cm tall, Flammulated Owls were not observed nesting in areas they had previously occupied (van Woudenberg 1999).

Ratings

This model employs a 4-class rating scheme because there is insufficient knowledge of habitat requirements to use a 6-class scheme yet there is sufficient knowledge to go beyond a 2-class rating scheme. This complies with the recommended rating scheme in the RIC standards manual (1999).

Provincial Benchmark

Ecosection	South Thompson Upland (Wheeler Mtn.)
Biogeoclimatic Units	IDFxh2
Habitats	Douglas-fir or Fd/Ponderosa pine forests, with snags, Fd thickets and grassy openings

Map Themes

Habitat Use	Life Requisite	Season	Rating Code	Ecosystem Attributes
Reproducing	Security/ Thermal, Food	Growing season	RE	<ul style="list-style-type: none"> heterogenous mature or old Fd or Fd/Py forest, with openings and thickets

Ratings Assumptions

Reproducing (RE) – Security/Thermal, Food	
Site Series	<ul style="list-style-type: none"> Open, mature or old Fd or Fd/Py forest (WD:co) rated up to High; Closed Fd forest rated up to Moderate
Structural Stage	<ul style="list-style-type: none"> Stages 6 and 7 rated up to High, stage 5 up to Moderate, stages 1-4 rated Nil.
Shrub Density	<ul style="list-style-type: none"> No effect on rating
Aspect	<ul style="list-style-type: none"> No effect on rating
Slope	<ul style="list-style-type: none"> No effect on rating
Condition	<ul style="list-style-type: none"> No effect on rating

Map Interpretation

Only the reproducing (RE) map theme is rated in the Flammulated Owl model, which includes habitats used for nesting territories during the growing season.

The highest value method is used to portray habitat ratings on the map, displaying the rating for the highest value unit occurring in the polygon.

Flammulated Owl home ranges can be quite small, and foraging generally occurs in the same area as breeding, so there is little concern over the size or proximity of suitable habitats.

Literature Cited

- Campbell, R.W., N.K. Dawe, I. McTaggart-Cown, J.M. Cooper, G.E. Kaiser and M.C.E. McNall. 1990. The birds of British Columbia, Vols. 2. Royal British Columbia Museum and Canadian Wildlife Service, Victoria, BC.
- Cannings, R.A., R.J. Cannings, and S.G. Cannings. 1987. Birds of the Okanagan valley, B.C. Royal B.C. Mus., Victoria, BC. 420pp.
- Cannings, R.J. and A.M. van Woudenberg. 2002. Flammulated Owl, in Standards for managing identified wildlife, Version 2. K. Paige ed. Min. of Water, Land and Air Protection. Victoria, BC.
- Howie, R.R., and R. Ritcey. 1987. Distribution, habitat selection, and densities of Flammulated Owls in British Columbia. Pages 249-254 in R.W. Nero, R.J. Clark, R.J. Knapton, and R.H. Hamre, eds. Biology and conservation of northern forest owls. Proc. Symp. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-142
- McCallum, D.A. 1994. Review of technical knowledge: Flammulated Owls. Pages 14-46 in Flammulated, Boreal, and Great Gray owls in the United States: a technical conservation assessment. U.S. Dep. Agric. For. Serv. Rocky Mtn. For. and Range Exp. Stn. and Rocky Mtn. Reg. Gen. Tech. Rep. RM-253.
- Resources Inventory Committee (RIC). 1999. British Columbia wildlife habitat rating standards, Version 2.0. Min. of Environ, Lands and Parks, Resource Inventory Branch. Victoria, BC.
- Rodrick, E. and R. Milner. 1991. Management recommendations for priority habitats and species. Flammulated Owl. Washington Dept. Wildlife, Olympia, WA.
- Roberts, G., and A. Roberts. 1995. Distribution, habitat selection, and densities of Flammulated Owls (*Otus flammeolus*) in the Cariboo-Chilcotin. B.C. Minist. For., Cariboo Forest Region, Williams Lake, BC. Unpubl. rep.
- St. John, D. 1991. The distribution of the Flammulated Owl (*Otus flammeolus*) in the South Okanagan. B.C. Minist. Environ., Lands and Parks and Okanagan Reg. Minist. Environ., Lands and Parks and Okanagan Reg. Wildl. Heritage Fund Soc. Unpubl. rep.
- van Woudenberg, A.M. 1999. Status of the Flammulated Owl in British Columbia.
- van Woudenberg, A.M. 1992. Integrated management of Flammulated Owl breeding habitat and timber harvest in British Columbia. Thesis Univ. B.C., Vancouver, BC.
- van Woudenberg, A.M. and D.A. Christie. 1997. Flammulated Owl population and habitat inventory at its northern range. Pages. 466-476 in J.R. Duncan, H.H. Hohnson, and T.H. Nicholls, eds. Second Int. Symp. Biology and conservation of owls of the Northern Hemisphere. February 5-9, 1997. Delta Winnipeg Hotel, Winnipeg, MB.
- Williams, G., G. Woodward and F. Bunnell. 1989. Distribution and general habitat requirements of *Otus flammeolus* in the Kamloops Forest Region: Job completion report. British Columbia Conservation Foundation, BC Fish and Wildlife Branch, and BC Forest Service.

Personal Communications

- Davis, Helen. 2011. Artemis Wildlife Consulting. Armstrong, BC.
- Hobbs, Jared. 2004. Ministry of Environment. Victoria, BC.

Flammulated Owl Suitability: Middle Shuswap River

