

## SPECIES ACCOUNT

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### Species Data

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

### Project Data

Project Name:	Central Okanagan Terrestrial Ecosystem & Wildlife Habitat Mapping Project
Project Type:	Terrestrial Ecosystem Mapping
Area:	Central Okanagan
Ecoprovince:	Southern Interior
Ecoregions:	Thompson-Okanagan Plateau
Ecosections:	Northern Okanagan Basin (NOB)
BGC Units:	IDFxh1, PPxh1
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***

Although little inventory has been conducted in the Central Okanagan, Flammulated Owls have been recorded from the project area.

## 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 were 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).

### **General Living during Growing Season**

#### 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, and 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 at all times, 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 <10cm 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 Zones	IDFxh2
Habitats	Douglas-fir (Fd) or Fd - ponderosa pine (Py) forests, with snags, Fd thickets and grassy openings

### **Map Themes**

Life Requisite	Habitat Use	Season	Rating Code	Ecosystem Attributes
Living	Security/Thermal	Growing season	STLIG	• heterogenous mature or old Fd or Fd/Py forest
Living	Food	Growing season	FDLIG	• openings in Fd or Fd/Py forest, or clearings or grassland adjacent to Fd thickets

### **Ratings Assumptions**

<b>General Living – Security/Thermal</b>	
Site Series	<ul style="list-style-type: none"> <li>• PP zone rated up to M; IDF rated up to High.</li> <li>• Xeric to mesic Fd stands rated up to High; stands lacking Fd rated up to Low.</li> </ul>
Structural Stage	<ul style="list-style-type: none"> <li>• Stages 6 and 7 (dbh&gt;30cm) rated up to High.</li> <li>• Stages 1 - 5 rated Nil.</li> </ul>
Aspect	<ul style="list-style-type: none"> <li>• South aspect for xeric sites rated up to M; cool aspect for mesic sites up to M.</li> </ul>
Slope	<ul style="list-style-type: none"> <li>• Gentle rated down 1 class. Mid- and upper slopes, ridges and benches rated up to High.</li> </ul>
<b>General Living – Food</b>	
Site Series	<ul style="list-style-type: none"> <li>• Xeric to mesic Fd forest rated up to High.</li> <li>• Fd clearings and grassland rated up to Moderate.</li> </ul>
Structural Stage	<ul style="list-style-type: none"> <li>• Stages 4 and 5 down 1 class due to tree density.</li> </ul>
Aspect	<ul style="list-style-type: none"> <li>• No effect.</li> </ul>
Slope	<ul style="list-style-type: none"> <li>• No effect.</li> </ul>
Range Condition	<ul style="list-style-type: none"> <li>• kc seral associations down 1 class due to lower insect abundance.</li> </ul>

## **Map Interpretation**

Only one map theme, or layer, will be portrayed on the map: cover for nesting, roosting and foraging (*security/thermal habitat for general living during the growing season, STLIG*).

The highest-value method will be used to display suitability ratings, so the highest rating of any of the ecosystem units occurring will be used to color the entire 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.

## **Management Recommendations**

Ensure critical habitat features are maintained in suitable habitats, including wildlife trees and sufficient recruits. Habitats should be linked with other natural areas to provide adequate buffers. Light recreation is appropriate providing wildlife trees can be maintained.

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# Flammulated Owl Suitability Map

