Northern Long-eared Myotis

Myotis septentrionalis

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Disclaimer: The following document was compiled based on a review of information currently available for this species as of January 9, 2006. This document can be used to assist with the identification of this species and to support the development of management recommendations as they relate to forestry activities. For more information on this species, please refer to the reference section or consult with a Species at Risk specialist.

Description

Myotis septentrionalis is a medium sized bat best recognized by its long rounded ears, which extend beyond the tip of the nose when laid forward. It has a comparatively longer tail and larger wing area than Myotis species of similar size; these structural adaptations are associated with its gleaning foraging strategy[1].

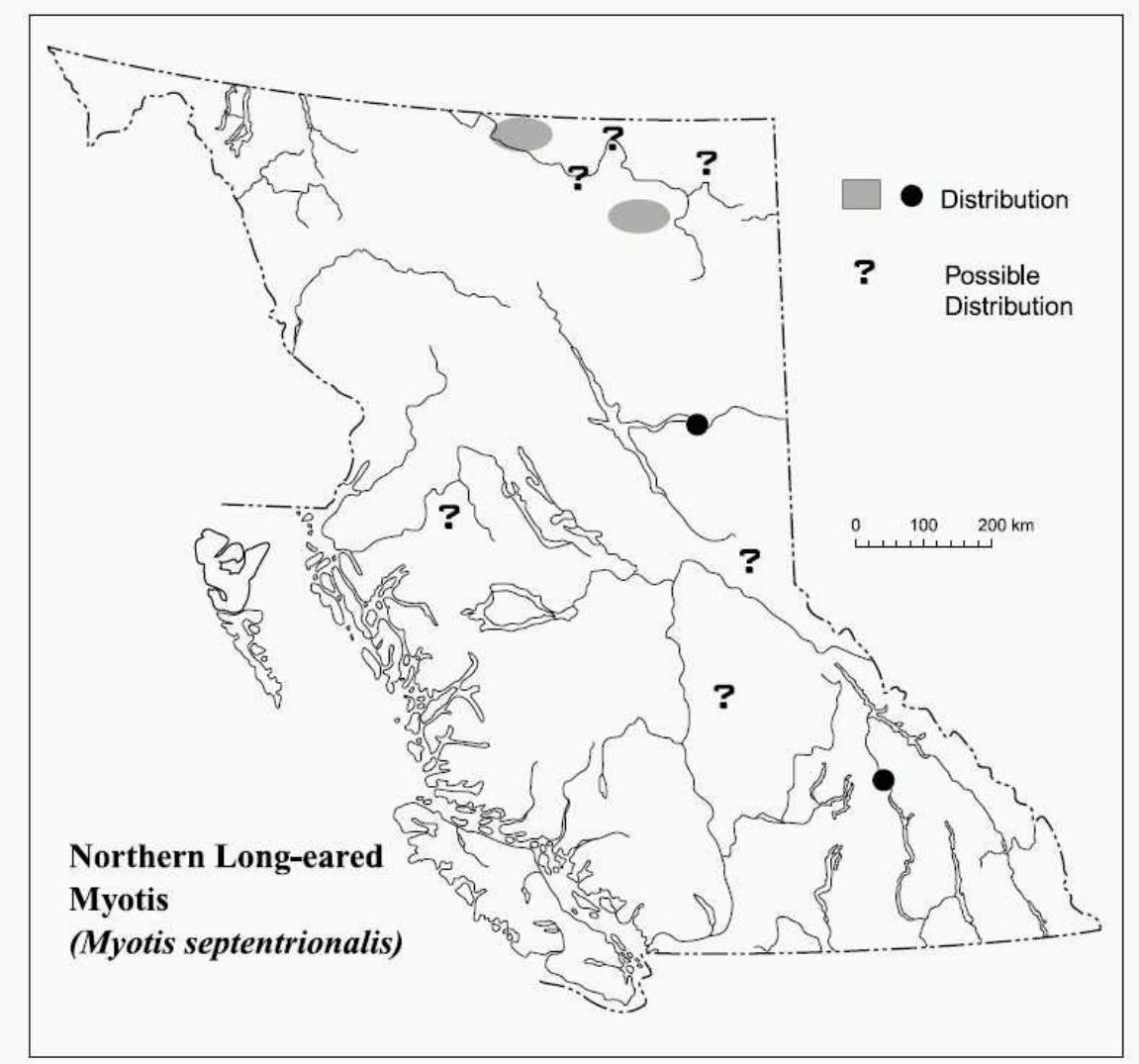
The total body length of Northern Long-eared bats is 78 mm. The tail measures 26 mm, the foot measures 9 mm, the ears measure 17 to 19 mm, and the forearm measures 35 mm. Northern Long-eared bats have a wingspan ranging between 23 and 26 cm and weigh 6 to 9 grams. The females of this species are generally larger and heavier than the males[1]. *Myotis septentrionalis* is essentially the same size and colour as the little brown bat, but with long rounded ears and a dull brown shoulder spot[,2]. Generally, the ears of Northern Long-eared Myotis extend slightly beyond the end of the nose when lightly pressed forward. In a similar position, the ears of Little Brown Bats do not reach the end of the nose and in Western Long-eared Bats they extend well beyond the nose (at least 5 mm[3]). The Western Long-eared Bat also tends to have much darker wing and ear membranes and paler fur than the Northern Long-eared Bat[3,4]. However, the distinguishing characteristics of these species require careful examination as, at first glance, these three species appear alike.

Photo courtesy of Tim Carter
(http://www.geocities.com/golfmutt/batstuff/imagesales/Batpage.html)

Distribution

Although its range may cover much of the northern part of British Columbia, the Northern Long-eared Myotis remains one of the rarest and least known bats in the province[4,5].

The Northern Long-eared Myotis has been found at a number of sites scattered through eastern, central and northern British Columbia, including the Peace River, Revelstoke, and Liard River areas. Knowledge of range is hampered by difficulty in the identification of this and related species. There are 8 known occurrences; undoubtedly more exist[5].



Distribution of Northern Long-eared Myotis in British Columbia[5]

***Forest Districts*[6]**

- Central Cariboo Forest District (DCC)
- Columbia Forest District (DCO)
- Fort Nelson Forest District (DFN)
- **Headwaters Forest District (DHW)**
- Mackenzie Forest District (DMK)
- Okanagan Shuswap Forest District (DOS)
- Peace Forest District (DPC)
- Prince George Forest District (DPG)
- Rocky Mountain Forest District (DRM)

***Biogeoclimatic Units*[6]**

- BWBS
- ICH
- MH
- SBS

Elevation
Not available

Map of Known Locations
Although this species is known to occur in the Headwaters Forest District, occurrence data from the Conservation Data Centre is not available. If a bat roost is discovered in your operating area, please consult with a professional biologist to verify the identity of the species.

Biology

Reproduction
Copulation occurs in the late summer and early fall during the swarming period when large numbers of bats congregate in and near certain hibernaculum. Females store sperm during hibernation, although some may copulate again at spring emergence. The majority of males become reproductively active in August and September. Females ovulate at the time of emergence and parturition (birth of young) occurs 50-60 days later. Later parturition dates at higher latitudes are due to later emergence and therefore later ovulation[6].

Females bear a single young, with parturition in British Columbia occurring in late June or early July (based on limited breeding information)[5,7]. Young-of-the-year may reproduce in their first fall, but the proportion of the cohort doing so is unknown. Nursery colonies are relatively small, most often including 2-30 adults (10-90 individuals, including young)[6].

Reproductive females roost communally during the summer, switching frequently between several roost trees. In Fort Nelson, maternity roosts were found in live trees of early decay stages, in mature stands, and in comparatively open areas of the stand. During the winter, Northern Long-eared bats have been located hibernating in caves and abandoned mine tunnels, although no records exist for British Columbia. Beyond these generalizations, little is known about the ecology of this species within the province. Also, there is no information regarding population trends due to the difficulty of monitoring bat populations away from sites where individuals congregate predictably (e.g., hibernacula or stable maternal colonies in buildings or caves)[8].

Foraging
Myotis septentrionalis emerges shortly after sunset to hunt. Hunting occurs over small ponds, forest clearings and forest edges at a height of 1 to 3 meters. Hunting is coupled with periodic rests (night roosting), followed by a second peak of hunting just before dawn[1]. These periods correspond to peaks in insect activity. However, the occurrence and duration of these activity peaks is highly variable and may be dependent upon air temperature, insect availability, precipitation, and energy needs of individual bats[9].

In general, these bats consume a variety of smaller night-flying insects, but they may sometimes glean sitting prey as well[1]. Generally, *M. septentrionalis* uses various food items including species of Hemiptera (true bugs), Lepidoptera (moths), Hymenoptera (bees and wasps), Diptera (flies), and Homoptera (includes leafhoppers and aphids). In

late summer and fall, species of Coleoptera (beetles), Trichoptera (caddis flies), and Lepidoptera were most common in the diet[3].

Photo courtesy of Forsite

Habitat

Throughout most of its range, the Northern Long-eared Myotis is associated with boreal forests; in British Columbia it is also found in the wet forests of the Interior Cedar–Hemlock Biogeoclimatic Zone. Elsewhere in North America, day roosts and nursery colonies have been found in buildings and under the bark of trees. In late summer or early autumn the bats gather to move to hibernacula, which may be up to 56 km away from foraging habitat[6].

Important Habitats and Habitat Features

Habitat selection by the Northern Long-eared Bat can be divided into two major components: winter hibernacula as well as summer roosting and foraging habitat.

1. Winter Hibernacula.
   The Northern Long-eared Myotis hibernates alone or in small groups, and selects narrow crevices where temperatures may be as low as 1.6°C[5]. Within hibernacula, *M. septentrionalis* generally occurs with other species of bats, but forms a small proportion of the total hibernating population. Northern Long-eared Bats usually hang singly in small narrow crevices and may therefore be easy to overlook[10,11,12].

   Full torpor and hibernation begins when there are no longer sufficient numbers of flying insects to make continued foraging worthwhile (usually after one or two killing frosts in September).

Bat hibernacula (photo courtesy of Trevor Moelaert)

2. Summer Roosting and Foraging Habitat.
   Northern Long-eared Bats commonly use crevices behind peeling bark or cavities in partially-decayed trees as summer day roosts[4].

Examples of roost trees used by radio-tagged bats. Photos courtesy of M. Kellner

Northern Long-eared Myotis under tree bark. Photo courtesy of Tim Carter (http://www.geocities.com/golfmutt/batstuff/imagesales/Batpage.html)

Individuals will switch among a number of roost trees, sometimes on a daily basis; however, roosts tend to be within a few hundred metres of each other[9,13]. Studies in the Interior Cedar-Hemlock Zone of British Columbia indicate that tall, wide-diameter, partially-dead trees with a high percent of the bark remaining are favoured by the Northern Long-eared Bat. Such trees tend to be found in over-mature forest stands[14].

Studies of foraging and habitat use also indicate the importance of mature forest stands to Northern Long-eared Bats. In the Interior Hemlock Forest Zone of British Columbia, 19 (25%) of all bats captured in old-growth forest stands (>120 years) were Northern Long-eared Bats. Unlike *M. septentrionalis*, the other Myotis species (*M. evotis. M. lucifugus, M. volans and M. californicus*) were distributed both in old-growth forest and logged areas[9].

In one study in northeastern British Columbia, nine female and 4 male Northern Long-eared Myotis were outfitted with radio-transmitters, yielding 21 and 17 roost trees respectively. Females roosted primarily in cracks (17), followed by primary cavity excavator hollows (3), and beneath loose bark (1), and males roosted primarily beneath loose bark. Females typically roosted in colonies, whereas all males roosted alone[15]. Female roost trees were farther away from the nearest neighbouring tree than were cavity trees from the same forest patch. No tree or site characteristics significantly discriminated between roost trees and cavity trees in other areas of the same stand. Females roosted at random with respect to the availability of tree species and decay stages, although all roosts were decay stage 2 trembling aspen or balsam poplar trees, and were located in age class 6 (mature) stands. Almost all cavity trees measured were deciduous. Bats commonly switched roosts each day, even when they were caring for nonvolant young, and the distance between roost trees was small (approximately 200 m on average)[15].

Conservation and Management

Status[6]
Global Rank: G4 (Uncommon but not rare; some cause for long-term concern due to declines or other factors)
Prov. Rank: S2S3 (Rare to uncommon)
BC List: Blue (Special Concern)

Threats
Northern Long-eared Bats are very sensitive to human disturbance in hibernacula and nursery colonies. Disturbing females with young can severely lower breeding success. Repeated disturbance at winter hibernacula can cause energy loss, abandonment of the caves and death. Various land use or industrial activities near bat colonies or in their foraging areas can adversely affect this species. Insecticide spraying on agricultural or forest lands is of particular concern, because it can potentially destroy the bat's food supply[4,9].

Like other bats, this species has a very low reproductive rate. Females bear only one young per year. Thus, even low rates of mortality caused by human disturbance, when added to natural losses can result in population declines and eventual elimination of local colonies[4,9].

Management Recommendations

In areas where this species is identified:

- Protect hibernacula and maternity sites from disturbance. Bat-friendly gates can be used to stop the public from entering these sites.

- If the area of forestry operations includes sites with cliffs or rock outcroppings which have openings or crevices (especially those which have sunny aspects), then these sites should be incorporated into wildlife tree patches (WTPs) where possible, or some other retention strategy which preserves the integrity of the site.

- Create a buffer zone such as a wildlife tree patch around identified hibernacula and maternity sites. The size of WTPs or other retention patches around hibernaculum or maternity roosts should be a minimum of 3.0 ha (approximately 100 m radius or equivalent area), and if possible be centered on the habitat feature. The WTP may be larger depending on other site factors (e.g., presence of nearby wetlands, lakes or streams as foraging habitat; presence of potential movement corridors for feeding and dispersal to alternate roosts). This will reduce disturbance from machinery as well as maintaining canopy cover near roosting sites.

- Retain forest patches that include large numbers of suitable cavity trees for bat roosting habitat.

- Do not blast, remove rock or talus, or construct roads within the WTP or other retention patch surrounding the hibernaculum or maternity roost unless there is no other practical option. Consult with Ministry of Environment staff in this situation.

- Do not harvest or salvage trees within the WTP or other retention patch surrounding the hibernaculum or maternity roost.

- When harvesting in areas immediately adjacent to the WTP or retention patch, encourage a relatively open residual stand structure by using partial harvesting systems that maintain >50% basal area.

- Retain a selection of stand structural elements, such as large green trees, snags, logs on the forest floor, and canopy gaps. Where available, snags should have cracks, peeling bark, bird holes, broken tops and hollow interiors.

- Do not use pesticides, particularly near wetlands and riparian areas.

Additional Management Recommendations:

Budget permitting, develop a habitat model to help identify high value habitat found within your areas of interest. The complexity of the model, and therefore its accuracy, will be dependent on budgetary constraints.

References

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