
Appendix 5.4.14A

Little Brown Myotis Species Account

BLACKWATER GOLD PROJECT

APPLICATION FOR AN
ENVIRONMENTAL ASSESSMENT CERTIFICATE /
ENVIRONMENTAL IMPACT STATEMENT
ASSESSMENT OF POTENTIAL ENVIRONMENTAL EFFECTS



Project Name: Blackwater
Scientific Name: *Myotis lucifugus*
Species Code: M_MYLU
Status: Yellow-listed species by the British Columbia Conservation Data Centre; listed as Endangered by COSEWIC.

1.0 DISTRIBUTION

Provincial Range

Little brown myotis is one of the most widespread and abundant bats in British Columbia (BC). It is found in all parts of the province, including Haida Gwaii.

Elevational Range

Up to at least 2,288 metre (m) elevation.

Provincial Context

Little brown myotis is the most far-ranging bat species in BC and is found in a variety of habitats from coastal rainforest to arid grassland, including urban areas. However, it is generally not found above the treeline. Little brown myotis may migrate up to 1,000 kilometres (km) to hibernacula, typically caves and abandoned mines. As a result, little brown myotis is considered a year-round resident.

While abundant in BC, this species has shown catastrophic declines (94% to 99%) in eastern North America in populations exposed to white nose syndrome. This syndrome is caused by a fungus discovered in 2006, which has been spreading at rates of between 200 km/year to 400 km/year. Concern has been expressed that if white nose syndrome spreads to BC, this species could become functionally extirpated in the future.

Project Area:

Ecoprovince:	<i>Central Interior</i>
Ecoregions:	<i>Fraser Plateau</i>
Ecosctions:	<i>Nazko Upland</i>
Biogeoclimatic Zones:	<i>Sub-Boreal Spruce</i> <i>Sub-Boreal Pine – Spruce</i> <i>Englemann Spruce – Subalpine Fir</i> <i>Boreal Altai Fescue Alpine</i>

Project Map Scale:

Project-specific

2.0 ECOLOGY AND KEY HABITAT REQUIREMENTS

Little brown myotis are small insectivorous bats, primarily active from April until October and hibernate during winter in hibernacula that may be found up to 1,000 km from their summer range. During summer, they may be found anywhere below the treeline and where there are aerial insects available. Males may be more abundant than females at higher elevations. Feeding sites can vary based on age, with juvenile bats foraging mostly in clearings and along roads and adults in more cluttered environments. Feeding typically takes place in two or more bouts approximately 15 to 20 minutes each. Over the course of a night, little brown myotis may consume their body weight equivalent (7 g) in insects. Feeding ranges may exceed 30 hectares, but are typically smaller for females, particularly during nursing.

Bats utilize up to four types of roosting environments: summer nocturnal and diurnal roosts, nursery colonies, and hibernacula. Summer roosts are the most variable, as they typically require fewer microclimate attributes, whereas nursery sites need stable high temperatures and hibernacula require cool stable sites with high humidity. Summer roosts may change frequently during the summer months, especially following the abandonment of nursery colonies.

3.0 HABITAT USE: LIFE REQUISITES

Living (LI)

The Living life requisites for little brown myotis are satisfied by the presence of suitable reproductive, feeding, and security/thermal habitat, which are described in detail below.

Reproducing (young)

Mating occurs prior to hibernation, but the pregnancy does not take place until the following June. Pregnancy lasts for 7 to 9 weeks, and females typically gather in nursery colonies that are situated in hot (30°C to 55°C), stable, and protected environments. Attics are frequently preferred in areas where human settlement exists; however, caves are more typically used in natural settings. Young take about three weeks to become free-flying, at which point they also begin eating solid food. Nursery colonies break down once the young are free-flying, typically late July to early August.

Feeding

Little brown myotis forage aerially in open areas around buildings, waterbodies, meadows, cliffs, and openings in forest. Prey composition may change seasonally, depending on availability. Insects form the entire diet with emergent aquatic insects forming the bulk of the prey taken; however, beetles and moths are also taken. Foraging bouts typically last for about 15 to 20 minutes, and temporary nocturnal roosts may be used while digesting. The foraging area surrounding the diurnal roost may be quite large.

Security/Thermal

Security and thermal requirements are satisfied by the presence of diurnal roosts and hibernacula. Summer roosts may include buildings, caves, abandoned mines, and tree cavities; however, hibernacula require high humidity and a constant winter temperature of 1 °C to 5 °C and are typically found only in caves and abandoned mines. Nursery roosts also require the site to have stable hot (30 °C to 55 °C) temperatures.

4.0 TERRITORIALITY

Little brown myotis are not known to be territorial, with hundreds to thousands of individuals using diurnal roosts and hibernacula. Males and females will usually use separate roosts during the summer when females are nursing.

5.0 SEASON OF USE

Although little brown myotis are resident in the Project area, the habitat requirements and the location of the Project indicate that they will be impacted only during the growing season (spring, summer, and fall) when most of their activity occurs (**Table 1**).

Table 1: Monthly Life Requisites for Little Brown Myotis

Month	Season*	Life Requisites
January	Winter	-
February	Winter	-
March	Winter	-
April	Early Spring	-
May	Late Spring	Reproductive/Feeding/Security and Thermal
June	Summer	Reproductive/Feeding/Security and Thermal
July	Summer	Reproductive/Feeding/Security and Thermal
August	Summer	Reproductive/Feeding/Security and Thermal
September	Fall	Reproductive/Feeding/Security and Thermal
October	Fall	-
November	Winter	-
December	Winter	-

6.0 HABITAT USE AND ECOSYSTEM ATTRIBUTES

Table 2 outlines how each life requisite relates to specific ecosystem attributes (e.g., site series / ecosystem unit, plant species, canopy closure, age structure, slope, aspect, terrain).

Table 2. Relationship between Terrestrial Ecosystem Mapping (TEM) Attributes and the Life Requisite for Little Brown Myotis

Life Requisite	TEM Attribute
Living (reproduction, feeding, security/thermal)	Site – site series, site disturbance, elevation, structural stage Vegetation – % cover by layer, species list by layer, structural stage modifier, stand composition modifier

7.0 RATINGS

There is an intermediate level of knowledge of the habitat requirements of little brown myotis in BC; therefore, a four-class rating scheme is used.

Table 3. Habitat Suitability Rating Scheme used for Little Brown Myotis

% of Provincial Best	Rating	Code
100%–76%	High	H
75%–26%	Moderate	M
25%–1%	Low	L
0%	Nil	N

Habitat Suitability Ratings

Habitat suitability is defined as the ability of the habitat in its current condition to provide the life requisites of a species (Resources Information Standards Committee, 1999). When a suitability rating for little brown myotis is assigned to a particular habitat, that habitat is assessed for its potential to support the species for a specified season and life requisite compared with the best habitat in the province (i.e., the provincial benchmark) for the same season and life requisite. Each biogeoclimatic zone, site series, and structural stage (stages 1–7) is evaluated and assigned a suitability rating class based on its ability to provide the life requisites for little brown myotis for the growing season (spring, summer, and fall).

Provincial Benchmark

Ecosection: Unknown

Biogeoclimatic Zone: Unknown

Habitats: Mature to old-growth mixed forest
 (structural stages 6 and 7), wetlands, and clearcuts.

Ratings Assumptions

1. Units with structural stages of 6 and 7 with mixed (deciduous and coniferous) species components will be rated up to high.
2. Units with structural stages of 0–3 will be rated up to moderate.
3. Wetlands will be rated up to high.
4. Rocky cliffs will be rated up to high.

Table 3: Summary of General Habitat Attributes for Little Brown Myotis

Season	Life Requisite	Structural Stage	Requirements
Summer	Living (Reproduction, Feeding, Thermal/Security)	6, 7	Mature forest and old-growth forest with mixed tree species.
Summer	Living (Reproduction, Feeding, Thermal/Security)	0	Wetlands, rock faces, and cliffs.

8.0 RATINGS ADJUSTMENTS

Mapping adjustments to habitat ratings are suggested to reflect the extent of suitable habitat, and to reflect individuals detected during field surveys and areas where habitats have been rated.

BLACKWATER GOLD PROJECT

APPLICATION FOR AN
ENVIRONMENTAL ASSESSMENT CERTIFICATE /
ENVIRONMENTAL IMPACT STATEMENT
ASSESSMENT OF POTENTIAL ENVIRONMENTAL EFFECTS



REFERENCES AND BIBLIOGRAPHY

- British Columbia Conservation Data Centre. 2014. BC Species and Ecosystem Explorer. BC Ministry of Environment, Victoria, BC. Available at <http://a100.gov.bc.ca/pub/eswp/>. Accessed March 2014.
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2012. Emergency assessment concludes that three bat species are endangered in Canada.
- Fenton, M.B. 1969. Summer activity of *Myotis lucifugus* (Chiroptera: Vespertilionidae) at hibernacula in Ontario and Quebec. *Canadian Journal of Zoology*, 47:597-602.
- Henry, M., D.W. Thomas, R. Vaudry, and M. Carrier. 2002. Foraging distances and home range of pregnant and lactating little brown bats (*Myotis lucifugus*). *Journal of Mammalogy*, 83: 767-774.
- Kunz, T., J. Reichard. 2011. Status review of the little brown myotis (*Myotis lucifugus*) and determination that immediate listing under the Endangered Species Act is scientifically and legally warranted. Available at <http://www.bu.edu/cecb/files/2010/12/Final-Status-Review.pdf>. Accessed October 2013.
- Nagorsen, D. 1993. Bats of British Columbia. Royal British Columbia Museum, Victoria, BC.
- Resources Information Standards Committee (RISC). 1999. BC Standards of Wildlife Habitat Mapping. Resource Inventory Committee Manual.