

SPECIES ACCOUNT

Species Data

Common Name: **Townsend's Big-eared Bat**
Scientific Name: *Corynorhinus townsendii*
Species Code: M-COTO
BC Status: Blue-listed
Identified Wildlife Status:
COSEWIC Status:

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
Ecoregions: Northern Okanagan Basin (NOB)
BGC Units: IDFxh1, PPxh1
Map Scale: 1:20 000

Distribution

Provincial Range

The Townsend's Big-eared Bat is sparsely distributed in BC. This species is found in southern and central BC, west to Vancouver Island, east to Cranbrook, and as far north as Williams Lake (Nagorsen and Brigham 1993, Cannings *et al.* 1999).

Elevation Range

Sea level to 1070 m in British Columbia.

Distribution in the Project Area

There are no documented observations of Townsend's Big-eared Bats from the study area but they are regularly found south of the study area, and there are a number of records from the Vernon area, including Cameron Point (RBCM records).

Ecology and Habitat Requirements

The Townsend's Big-eared Bat occurs in a variety of habitats such as coniferous forest, riparian communities, xeric shrub-grassland, arid plateaus, and desert. Two subspecies are recognized; one inhabiting the southern interior of the province and one in coastal habitats. The range of the interior subspecies extends from the Cascade to the Rocky Mountains to south of Williams Lake. Overall habitat preference seems to be rugged, arid landscapes, often with open forests and riparian areas (Rasheed and Garcia 1995). They seem to avoid very high elevations or very wet parts of the southern interior.

Townsend's Big-eared Bats usually form small colonies, although a colony consisting of approximately 200 individuals was found summer roosting in a building near Cranbrook (M.Firman pers. comm.). Buildings and cavernous rock features provide the only known roosts in BC, which is consistent with observations elsewhere in its range. Males usually roost alone in caves and other rock features.

Unlike most BC bat species, hibernacula of Townsend's Big-eared Bats have been observed throughout their range. About 16 hibernation sites have been discovered for both subspecies, although the total known winter population is less than 100 bats (Blood 1998). Most are comprised of very few individuals, hanging singly in open portions of caves and mines (Nagorsen *et al.* 1993). The hibernacula are often well-ventilated, suggesting that *C. townsendii* may be tolerant to colder hibernacula temperatures than some other bat species (Kunz 1982). During fall, these bats fly 10 to 65 km to hibernacula.

Townsend's Big-eared Bats are highly maneuverable in flight, and forage along waterways and edges of forests. This species feeds primarily on small moths, although selected lacewings, beetles, and flies are also taken (Kunz 1982, Van Zyll de Jong 1985).

Mating occurs in autumn, at the hibernacula or prehibernacula staging areas. Fertilization is delayed until spring and the young are born in July at nursery sites, which are used throughout the growing season. Only a few maternity colonies have been documented in BC; most have been found in abandoned buildings. Females annually give birth to a single pup and longevity records for *C. townsendii* suggest a lifespan of 16.4 years (Kunz 1982).

Townsend's Big-eared Bats are at risk because they are confined to small regions of suitable habitat at low elevations in the southern part of BC. This species is sparsely distributed across its range and is particularly vulnerable to disturbance by people. Townsend's Big-eared Bats roost in open chambers, unlike some other bat species that hide in crevices, and so they are very susceptible to intrusions. Disturbance of females with young can severely lower breeding success. Repeated disturbance at winter hibernacula can cause energy loss, abandonment of the hibernation site, and death.

Living during Growing Season

Security/Thermal Habitat

Security habitat is habitat that provides sites for day roosts. Day roosts may be found in caves, mines, crevices in cliffs, and likely in large trees with hollows and crevices. Warm roosts (e.g., buildings, large tree hollows) are required by adult females for fetal and young development. Males are much more tolerant of cool conditions (e.g. caves, mines, tunnels). TEM does not capture mines, caves or buildings, but cliffs are captured and large trees are inferred, which enables some modeling of security thermal habitats during growing season.

Trees that may offer suitable maternity roosting habitat must be well over 50 cm dbh and are probably either ponderosa pine or cottonwood.

Food

Townsend's Big-eared Bats feed primarily on small moths (3 to 10 mm long) and secondarily on other insects such as lacewings, dung beetles, flies and sawflies (Blood 1998). This species forages in or over shrubby riparian vegetation and along ridgelines within mature, insect-rich Douglas-fir forests. The dominant vegetation in these riparian habitats includes willows, cottonwoods, water birch, and red-osier dogwood. They also hunt along the edge of forests bordering grasslands and disturbed areas such as clearings. As gleaners, these bats can pick insects off vegetation or other surfaces. Gleaning behavior may allow this bat to take advantage of forest habitats that are not used by some less maneuverable bat species (Blood 1998).

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	East Kootenay Trench
Biogeoclimatic Zones	Ponderosa Pine
Habitats	Riparian habitats, tall wetland vegetation and open mature forests, with nearby warm aspect caves or large tree cavities

Map Themes

Life Requisite	Habitat Use	Season	Rating Code	Ecosystem Attributes
Living	Food	Growing season	FDLIG	<ul style="list-style-type: none"> • areas with abundant insects, especially deciduous groves and open coniferous forests
Living	Security/ Thermal	Growing season	SHLIG	<ul style="list-style-type: none"> • cavernous features in rock or very large trees (Py, Ac, Fd)

Ratings Assumptions

Living, Growing season – Food	
Site Series	<ul style="list-style-type: none"> • Deciduous and mixed stands rated up to High, even if dense. • Open coniferous forest rated up to High. • Grasslands rated up to Moderate. • PD (Ponds) rated up to High. • CT (Cattail marsh) rated High.
Structural Stage	<ul style="list-style-type: none"> • Open structural stage 6 and 7 rated up to High. • Dense structural stages of coniferous ecosystem units rated lower than open structural stages. • Stage 2 usually rated Low or Mod, but up to High (e.g. Cattail marsh rated H).
Living, Growing season – Security/Thermal	
Site Series	<ul style="list-style-type: none"> • Warm aspect cliffs, rock outcrops, and boulder fields that have potential for large crevices and openings rated High. • Cool aspect cliffs, rock outcrops rated up to Moderate. • Forested units rated up to High.
Structural Stage	<ul style="list-style-type: none"> • Stages 6 and 7 (likely to contain snags dbh > 50cm) rated up to High. • Stage 5 rated up to Moderate for coniferous forest and aspen stands; up to High for cottonwood stands. • Stage 4 up to Low. • Stages 1 to 3 rated Nil for forest units.
Aspect	<ul style="list-style-type: none"> • Warm aspect rated higher than cool aspect and no aspect (i.e. gentle slopes).
Slope	<ul style="list-style-type: none"> • No direct effect.

Map Interpretation

Two habitat uses will be portrayed. The most important of these is security/thermal during the growing season. This habitat use represents day roosts, including maternity colonies. Summer foraging habitat will be portrayed below roosting, as the required attributes are much broader and more available.

The highest-value method will be used to portray roosts, showing the highest value of any ecosystem unit occurring in a polygon, as they are the most limiting and critical habitat feature. Foraging habitats will use the largest area method, portraying the rating for the ecosystem with the largest area in a polygon.

Management Recommendations

Management of these areas should focus on ensuring there are no disturbances to roosting habitats. Sites can be investigated to determine whether roosts are actually present, but inventories should be conducted at least once over the four seasons. Alternatively, roosts could be assumed to be present where field checking confirms the presence of suitable habitat. A “no disturbance” buffer should be placed around roosting habitats and, if necessary, the roost should be protected. Foraging habitat should be incorporated into the buffers around roosting habitat and riparian leave areas.

Literature Cited

- Blood, D.A. 1998. Townsend's Big-eared Bat; Wildlife at Risk in British Columbia. Brochure. BC Environment. Victoria, BC.
- Cannings, S.G., L.R. Ramsay, D.F. Fraser and M.A. Fraker. 1999. Rare amphibians, reptiles, and mammals of British Columbia. Ministry of Environment, Lands and Parks and Resource Inventory Branch, Victoria, BC.
- Kunz, T.H. and R.A. Martin. 1982. *Plecotus townsendii*. Mammal. Species 175:1-6.
- Nagorsen, D.W. and R.M. Brigham. 1993. Bats of British Columbia; Volume 1 The Mammals of British Columbia. Royal British Columbia Museum Handbook. UBC Press, Vancouver B.C.
- Nagorsen, D.W., A.A. Bryant, D. Kerridge, G. Roberts, A. Roberts and M.J. Sarell. 1993. Winter bat records for British Columbia. Northwest Naturalist. Winter 1993, 74: 61-66.
- Rasheed, S.A. and P.F.J. Garcia. 1995. Status of Townsend's Big-eared Bat (*Plecotus townsendii*) in British Columbia. Prepared for the Wildlife Branch, BC Environment, Victoria, BC.
- 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.
- Roberts, F. and A. Roberts. 1996. Habitat Selection by Townsend's Big-eared Bats.
- Van Zyll de Jong, C.G. 1985. Handbook of Canadian Mammals. Vol. 2. Bats. Natl. Mus. Of Nat. Sci. Natl. Mus. of Can., Ottawa, Ont.

Townsend's Big-eared Bat Suitability Map

