

WILDLIFE



VIEWING

.....
YUKON
Bats
.....



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A Guide to **YUKON BATS**

This booklet provides some basic information about bats and some specific details about Yukon bats. It gives you a glimpse into a year in the life of Little Brown Bats in Yukon, and provides hints at how and where you can look for bats yourself. Learn about what to do if bats move into your house and how you can help protect bats by providing them with new homes.

While we still have lots to learn about Yukon bats, we do know a bit about their diet, their life cycle, and their habits. Use this booklet to challenge bat myths and learn bat facts so that you too can appreciate one of Yukon's most mysterious animals.

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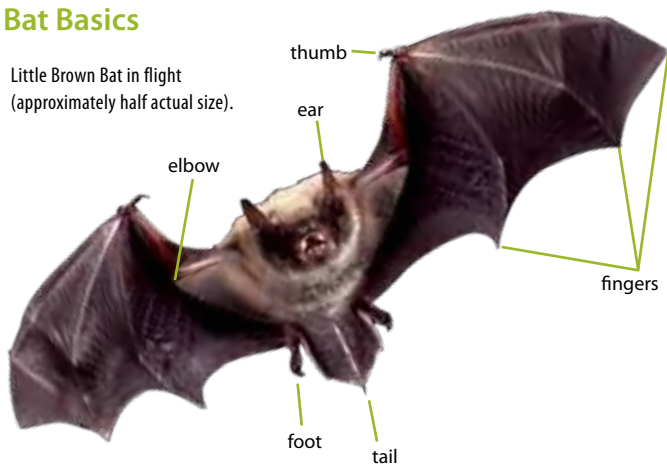
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Get to know bats and dispel images like this one.



Bat Basics

Little Brown Bat in flight
(approximately half actual size).



Worldwide there are about 1,100 species of bats, representing nearly one-fifth of all types of mammals. In Yukon, the Little Brown Bat is the most widespread. The Northern Long-eared Bat and Big Brown Bat have been recorded in the far south of the territory.

Bats are an important part of our ecosystems. Over 50 million years, bats have evolved into many sizes, body forms, and food habits. Different types of bats have different behaviours that benefit humans:

- Some bats disperse fruit seeds; most tropical trees depend entirely on bats to spread their seeds.
- Many bats pollinate flowers, like the agave plant used for making Tequila.
- Most bats, including those that live in Yukon, eat large amounts of insects, including those annoying mosquitoes!

Night-time animals

Bats are nocturnal so they only fly at night. This gives them a unique niche (place in nature) as nocturnal (night-time) insectivores (insect eaters). If they flew during the day, bats would be competing with birds for food.

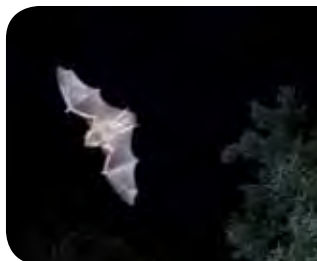
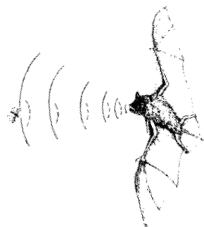
Night-time flying is safer for bats. Other than owls, there are few flying predators at night. Also, bats get hot when flying; night-time temperatures help keep them cool.

Echolocation

Because they fly in darkness and eat small insects, Yukon bats rely much more on their ears than their eyes. Bats locate objects in the darkness by listening for their echoes. "Echolocation" tells bats the distance, speed, direction, texture, and size of objects and prey. It has a short range — only a few metres.

Bats seem like silent creatures to humans because bat voices are on a higher frequency than we can hear.

Human audible range: 0.02 to 20 kHz	
Bat call: 20-200 kHz (out of range of human ears)	Intensity: 50-120 decibels
Normal human conversation: 0.5 to 3 kHz	Intensity: 50 decibels



A camera flash lights up a Little Brown Bat at night. (Lea Randall)

Scientists use a machine that converts bat calls to a sound humans can hear. These "bat detectors" help us locate bats in the dark of night, and to listen to bats communicating within their roost.

Hunting and feeding

Little Brown Bats often feed over water and along the margins of lakes and streams. Yukon's Little Brown Bats have unique adaptations such as large ears, shorter wings, and higher frequency calls that allow them to effectively feed in forest habitats.

Around solstice, Little Brown Bats in Yukon feed continuously without roosting between meals to take advantage of the short summer nights, unlike bats further south. They feed mainly on flying insects but will also glean (pick off vegetation) spiders and insects. A colony of 100 Little Brown Bats can eat almost 20 kilograms of insects in four months.

It's a bat's life

Little Brown Bat
echolocating.



Long-lived

Though they are small like mice, Yukon's bats live more like Grizzly Bears: they have long lives and few young. Animals similar in size to Little Brown Bats, such as mice and shrews, produce dozens of young each season but only live for one or two years. In contrast, Little Brown Bats in Yukon only raise one pup every one or two years but can live up to 34 years.

Spring

In April, Little Brown Bats emerge from hibernation and migrate to their summer habitats in Yukon through May and June.

Throughout the seasons, adult bats roost in separate male and female colonies. Because pregnant and nursing females require a very warm roost, hundreds of bats will huddle together to generate temperatures of 30°C to 55°C. The warmth encourages rapid fetal growth and good milk production. Male bat colonies are cooler with fewer individuals (sometimes only one or two) sharing a roost.



Bats in a cabin roost. (Brian Slough)

The stereotypical 'bat cave' is not common in Yukon. Instead, Little Brown Bats roost in rock crevices, on the underside of bark, in standing dead tree cavities, and in cabins warmed by the sun.

Roosts are always within a few kilometres of water for drinking and foraging for insects. Bats are loyal to their roosts and may return to the same place year after year.

Bat bit: Twenty million Mexican free-tailed bats live in Bracken Cave, Texas, eating 250 tons of insects each night. There are so many (largest accumulation of mammals in the world) that their exodus compels the local airforce base to shut down.

Summer

Little Brown Bats usually give birth to a single pup in July. Females will spend most of their energy raising the pup over the summer. Remarkably, pups can fly at two or three weeks, and are weaned and self-sufficient within a month. Nursery colonies start to break up by August, with the females and their quickly maturing pups moving to other feeding areas.



Habitat is where it's at. The Northern Long-eared Bat likes dense boreal forest with small ponds.
(YG-Cameron Eckert)

Fall and winter

Environment Yukon receives reports of bats well into September and even early October, though most have migrated to their out-of-territory hibernating areas by then. If temperatures dip below 5°C — which can happen in early fall here — bats can go into torpor (a short-term state of hibernation) to conserve energy.

Biologists are unsure where Yukon bats overwinter but suspect they move to areas where there is more moisture, like Alaska's coast or near hot springs. Yukon's winter air is so cold and so dry that hibernating bats would freeze solid or dry out before spring returns.



Hibernation allows bats to conserve energy at a time when temperatures are cool and food is scarce. When active, bats have a resting heart rate of 100 to 200 beats per minute and 1,000 beats per minute when flying. During hibernation, bats reduce their heart rate to 20 beats per minute and drop their body temperature from 40°C to 5°C.

Little Brown Bat hibernating, covered in condensation.

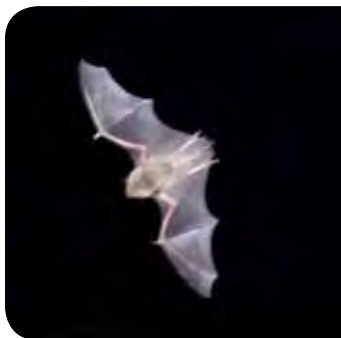
Viewing bats

While bats live and feed in almost any low-elevation habitat, they seem to prefer the forest-water edge. Insects such as mosquitoes are found in abundance over ponds, bays, or small lakes. Bats will travel at night from their roosts to the water to feed and drink.

Stand by the water's edge so you might see bats swooping low over the surface. Look between the trees as well, because Yukon bats have adapted to hunting in the forest.

The best place to see bats is at their roosts, watching them come and go. The best months are June, July, and early August when large nursery colonies are busy feeding in the short summer nights.

Viewing is most exciting when the bats first leave the roost — generally within an hour after sunset — but you can watch individuals coming and going until sunrise. Bats normally don't fly about during the day, but you may spot them spreading their wings at roost entrances to cool down in the heat.



With some patience you can watch bats come and go from their roosts.

(Lea Randall)



Attend a late-night bat interpretive walk offered in the summer, hosted by the Wildlife Viewing Program. (YG-Brian Charles)

Key bat-viewing areas



Rock crevices near water, such as at Miles Canyon, in Whitehorse, and Paint Mountain, near Haines Junction.

(Brian Slough)



Trails and forest openings and edges near water and mature forests.

(David Nagorsen)



Lakeside cabins and shelters.

(David Nagorsen)



The Watson Lake Airport Control Tower.

(YG-Tom Jung)



Bat houses such as this one are a great place to wait at sunset for bats to emerge. Bat houses have been installed in many Yukon government campgrounds such as Squanga Lake, Marsh Lake and Swan Haven.

(YG-Carrie McClelland)

Mature forests and large snags near water.

(YG-Tom Jung)

Bat biographies

Little Brown Bat *Myotis lucifugus*

Wingspan: 25 cm

Weight: 8 g (6-10 g) (about the weight of a toonie)

Lifespan: Up to 34 years

Roosts: Human-made buildings, rock crevices, tree cavities, under tree bark

This medium-sized bat has cinnamon-buff to dark brown fur above, and buff to pale grey fur underneath. Wings are dark brown. Young born that year have dark fur and their wings appear waxy.

Males and females lead separate lives.

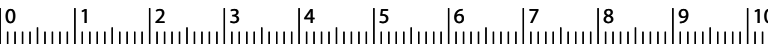
Males live alone or in small colonies, often in cooler day roosts and in marginal habitats at higher elevations (but less than 1,000 m) than females. Females roost in larger, warmer colonies of up to several hundred bats — the largest found in Yukon had more than 800.

Unfortunately we know very little about male Little Brown Bats in Yukon. They make up less than 10 per cent of known colonies.

The conservation status of the Little Brown Bat in Canada is *Secure* due to its widespread distribution and apparently healthy local populations. However, Little Brown Bat populations in Yukon occur at relatively low densities compared with other parts of Canada. Population trends are unknown.



Little Brown Bat resting in a pine tree. (Jennifer Talerico)



Distribution of the Little Brown Bat



Bat bit: When most active, one Little Brown Bat can catch up to 1,200 mosquito-sized insects in one hour!



One of the best known Little Brown Bat colonies can be viewed at Chadburn Lake Recreation Site, near Whitehorse. (Brian Slough)

RESEARCHER LEA RANDALL recently studied the effects of forest disturbance on habitat selection of Little Brown Bats in the Haines Junction area. She found that Yukon bats preferred to fly and forage in beetle-affected forest rather than in logged or burned forest. This was especially true near summer solstice, perhaps because these areas are darker on bright summer nights and may provide darker areas to fly and forage, thus avoiding nocturnal predators. In general, she found severity of beetle infestation had little effect on habitat selection by Little Brown Bats.

Northern Long-eared Bat *Myotis septentrionalis*

Wingspan: 23 cm

Weight: 6-9 g

Lifespan: About 20 years

Roosts: Tree cavities and under tree bark

Northern Long-eared Bats were first captured in the LaBiche River valley in southeast Yukon in 2004. They have also been spotted in Watson Lake. Biologists suspect that its range includes the southern Liard River Basin, east of Watson Lake. It forages in dense forest.



The Northern Long-eared Bat has dark brown fur on the back and pale or tawny fur on the underside. Though it looks similar to a Little Brown Bat, its body is smaller and its ears are actually 4 mm longer.

The conservation status of the Northern Long-eared Bat is *Sensitive* in Yukon, *Secure* in Canada. Because of its narrow range of habitat and small populations, it may be affected by land use activities such as forestry.



Old, dead and dying trees offer great roosts for bats on or under bark and in cavities made by birds. (YG-Tom Jung)

Big Brown Bat *Eptesicus fuscus*

Wingspan: 33 cm

Weight: 15-18 g

Lifespan: About 20 years

Roosts: Human-made structures

We only know about the Big Brown Bat from audio recordings in the Teslin area in 1999 and 2007. The Big Brown Bat is known to be present in northern British Columbia and Alberta. A single record of the Big Brown Bat exists for Central Alaska.

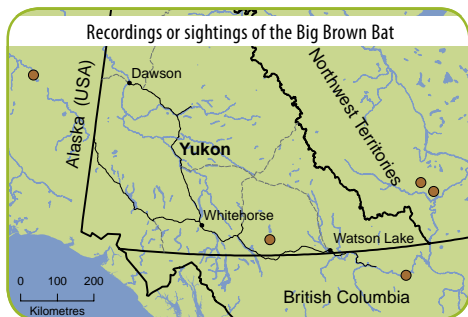


The Big Brown Bat often roosts in buildings. Roosting, feeding, migration, reproduction, and hibernation behaviours are similar to the Little Brown Bat's but — not surprisingly, given its name — Big Brown Bats are physically larger. They are also less tolerant of high temperatures, preferring roosts below 35°C.

Big Brown Bats have a large broad head and long pale to dark brown fur that appears oily. They tend to emerge at dusk much earlier than Little Brown Bats.

The conservation status of the Big Brown Bat in Yukon is *Undetermined* until it is confirmed to reside in Yukon and more information becomes available. It is *Secure* in Canada.

Bat bit: One colony of Big Brown Bats can protect a farm from up to 18 million rootworms each summer.



Living with bats

One of the most common ways bats encounter humans is when they set up colonies in dwellings, usually in the roof, attic, eaves, or walls. Bats enter through openings as small as 1.5 cm x 3 cm in windows, walls, doors, or chimneys.

If a bat is flying around your house, don't panic — simply turn off the lights and open all the doors and windows. The bat will quickly find its way out.

If a bat is roosting (hanging upside down), catch it with a pillowcase or cardboard box and carry it outdoors. If the weather has been cold and you find a pile of bats that are alive, but not moving ("torpor"), you can gently scoop them up with a shovel and carry them out of the building.

Though Little Brown Bats will never attack you, they have a lot of teeth and will bite if they feel threatened. Be sure to wear leather gloves when handling bats.

A bat roost in your house or cabin can be a challenge. While you might tolerate a few bats, a big nursery colony means noise (scratching and squeaking pups) and smells (bat droppings). Bats will return to the same roost so plan to gently evict your unwanted guests as soon as possible.

Remember that any large colony will have nursing or pregnant females present. Avoid disturbing it until mid-September when the pups are self-sufficient.



Bats roosting on the ceiling of an old cabin.
(Brian Slough)

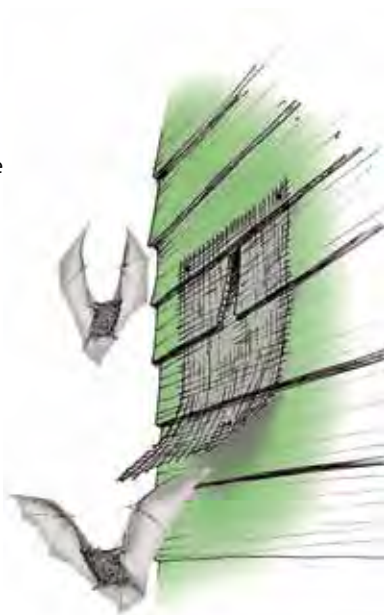
BAT DROPPINGS (also known as guano) are mostly insect parts and crumble to the touch, unlike similar looking, but solid, mouse droppings. You may see guano below roost entrances or patio umbrellas, or on outside walls or furniture.

If bats are present

- Find out where the bats are exiting — watch at dusk.
- Put a one-way sleeve exit over the entry or exit point (see image at right).
- Discourage roosting by hanging thin strips of Mylar foil or suspending balloons in attics or near roost entrances to interfere with bat sonar.
- Light up your attic to dissuade bats from staying.

If bats are not present (after September and before April)

- Find out where the bats are entering by looking for cracks and holes stained by oily fur, or are above guano.
- Seal the access points with screening or polyurethane expanding foam before the bats return next season.



Exclusion technique: one-way door.

Eviction is stressful for bats. It can be difficult if you can't find all of the entrances. Providing a bat house as an alternative roost may be the best solution. (See the 'Bat House' section on page 18.)



Bats can squeeze through the size of a quarter. To keep them out of your house, carefully seal all windows, soffits and eaves with foam or caulking, and fix places where joined materials have warped or shrunk.

(Brian Slough)

Bat myths

Myth: Bats are a kind of flying mouse

Bats are not flying mice and are more closely related to humans than any other North American mammal. They belong to the family Chiroptera, which means “hand-wing.” Smaller bats (microchiropterans), like the Little Brown Bat, are believed to be descendants of a shrew-like ancestor. Large bats (megachiropterans) may have evolved from lemurs.

Myth: Bats are blind

Bats smell, hear, taste, feel and see, just like we do. They are also able to use echolocation to navigate in darkness.

Myth: Bats fly into people's hair

While you might feel a “swoosh” as a bat deftly catches an insect near your head, these expert flyers won't get tangled in your hair. Though they may fly straight towards you, once they detect your head with echolocation they'll veer off. Enjoy the close encounter!

Myth: All bats drink blood

There are three South American species of bats that live off the blood of animals, but most bat species do not. Some bats eat only pollen; others only fruit. One bat is able to eat toxic frogs. However, all bats in the boreal forest hunt insects at dusk or at night.

Myth: Bats give humans rabies

Since 1925, only five cases of rabies in Canada have been contracted from bats, and none have been reported in Yukon. Bats are no more likely to become rabid than other wild animals. Sick bats die quickly. They usually only bite in self-defense and do not become aggressive like rabid dogs. Rabies cannot be transmitted through guano. One rabid bat has been reported in southeast Alaska to date.



This Little Red Flying Fox is a megachiropteran and quite different from the Little Brown Bat.



Bats will never attack you but have many teeth and may bite you if they feel threatened.

So many questions...

Though we continue to learn more about Yukon bats, there are still so many things we don't understand.

Why do bats migrate to Yukon?

Though there are plenty of insects to eat in Yukon, the region is really unsuitable for a bat's lifestyle.

The summer nights are too short and cool, and the winters too dry, so why come at all? Yet the Little Brown Bat is found all over southern Yukon.



Researchers work at night capturing bats and recording data. (YG-Carrie McClelland)

Why aren't bats found north of Dawson City? Some bats in Europe range beyond the Arctic Circle and have adapted to foraging in the light of the midnight sun. Perhaps northern Yukon is just too far for bats to migrate from their hibernating sites. Or perhaps it's because there isn't enough food or the right habitat.

Where do Yukon bats hibernate? Biologists don't know for sure but suspect Yukon bats move to areas where there is more moisture, such as areas surrounding hot springs or caves along the southeast Alaska coast where the air is humid and temperatures remain around 1°C to 5°C.



This Harp Net and catch bag was placed at exit of a bat house to gently catch bats as they leave the roost. In the summer, biologists capture bats briefly to measure and weigh them, and add a small metal band to their forearm. The numbers on the band allow us to keep track of individual bats and follow their lives over many years. (YG-Carrie McClelland)

Bats at risk

Bats have low reproduction rates. They usually give birth to only one pup per year. Cool, short summer nights may force Yukon bats to conserve their energy to survive and so they may not have young every year.

Bat populations as a result are quite sensitive to disturbances such as disease or habitat loss. When bat colonies crash, it takes many, many years for their population to recover. Nearly 25 per cent of bat species in the world are in decline or endangered.

Go to bat for bats!

Just like us, bats need food, water, shelter, and space to survive. Bats help plants grow and eat a lot of insects. Here are some things you can do keep our environment healthy and bat-friendly:

- Do not disturb roosting bats, especially in June and July when they are taking care of their pups.
- Help keep wetland and forest habitats in the natural condition, so bats have a place to feed, sleep, and raise their young.
- When cutting down trees, leave large snags (standing dead trees) with loose bark because these provide valuable roosting sites.
- Consider having a bat house (see the 'Build a Bat House' section for details) so they'll have a safe place to live — and you'll have fewer mosquitoes.
- Share your knowledge of bats with friends — help dispel the harmful myths about bats.



Environment Yukon's Y2C2 crews installed a bat house at Swan Haven in 2009. (YG photo)

IF YOU SUSPECT *illegal activity related to bats or other wildlife, please call the Turn In Poachers (TIP) hotline at 1-800-661-0525.*

White nose syndrome

A new threat to bats is white nose syndrome (WNS), named for a distinctive fungal growth on a bat's muzzle and wings. It is responsible for more than a million bat deaths since 2007 when it was first identified in North America.

Bats with WNS are emaciated and dehydrated, and exhibit strange behaviour such as flying during the daylight and leaving hibernation too early in the spring. The bats are weakened by the lack of food and easy prey for day-time predators such as hawks.

In 2010, WNS was confirmed in Ontario and Québec, and biologists fear the disease is spreading west. Scientists do not yet know how the disease spreads or how best to treat it.

There is no known human health risk from WNS but people are advised not handle dead bats.



Hibernating Little Brown Bats infected with WNS in a New England cave. (Alan Hicks, NYSDEC)



The white fungus can be seen around the nose of this Little Brown Bat. (Alan Hicks, NYSDEC)

IF YOU FIND A BAT, do not touch it. If it appears sick or shows no fear of humans, report it to a Conservation Officer at 1-800-661-0525 (toll free). If you are bitten by any animal, including bats, seek medical help immediately. For more information on bats and health issues, contact Yukon Communicable Disease Control at (867) 667-8323 or 1-800-661-0408, ext. 8323 (toll free in Yukon).

Build a bat house

Though you may not want a colony of squeaking bats in your attic, bats are great to have nearby. By installing a bat house on your property you can give bats a safe place to live while benefiting from their insect control services.

You can build your own bat house. If you buy a commercially built one you should modify it to meet the needs of Little Brown Bats in Yukon's cool climate. Successful Yukon bat houses should be:

- fully caulked and unvented
- multi-chambered
- painted or stained a dark colour to absorb sunlight
- mounted high on the southfacing wall of building

Download detailed instructions for building a Yukon-specific bat house from the government website.

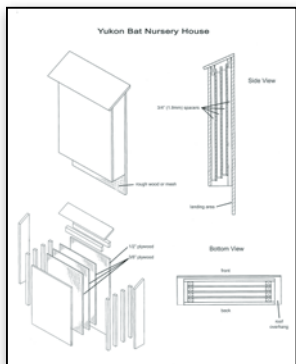
Be patient. It may take a year or two for bats to discover and occupy a new house, but the wait will be worth it. Happy bat viewing!



Home-made bat house on stilts. (YG-Tom Jung)



This homeowner enjoys constant natural pest control thanks to bats by night and swallows by day. (Brian Slough)



Build your own bat house by requesting detailed instructions from Environment Yukon's Wildlife Viewing Program. (YG photo)



How you can contribute to science

People have observed bats in Yukon for hundreds of years. Scientists have studied them since the early 1900s. However, the first map of bat populations was not produced until 1975 and included only the Little Brown Bat. Two new species were found after research and monitoring increased in 1995.

Today, researchers are particularly keen to hear about roost sites, hibernation areas, and migration arrival and departure dates from your area. By reporting your own bat observations to Environment Yukon's Biodiversity Program you can contribute to science and to our understanding of Yukon bats.



Bat detectors record ultrasonic bat calls nightly, for up to a week. (YG-Tom Jung)

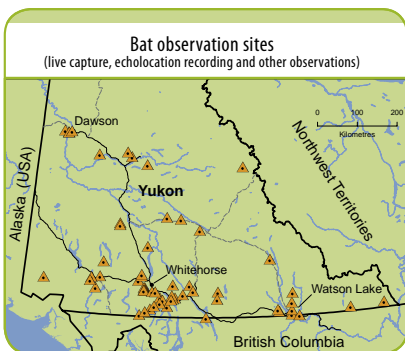


Bat researchers capture, band and take tissue samples to find out genetic variation, roost fidelity, longevity, movements and, by chance, hibernation sites.

(YG-Tom Jung)

IF YOU SEE INTERESTING BATS

or large colonies, please report them to the Wildlife Viewing Program.



Are other bats moving to Yukon?

Only three species of bats have been documented in Yukon but there might be more. After all, several other species live just across Yukon's borders.

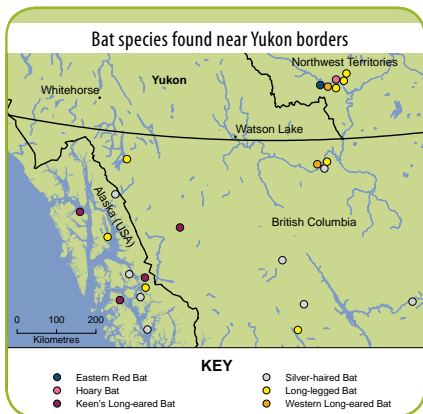
The Western Long-eared Bat (*Myotis evotis*) lives in northern British Columbia and the California Bat (*Myotis californicus*) in southeast Alaska. The Long-legged Bat (*Myotis volans*), Keen's Bat (*Myotis keenii*) and Silver-haired Bat (*Lasionycteris noctivagans*) have been found in both northern B.C. and Alaska. Recently, new audio recordings have been documented that indicate some of these species may be moving into southern Yukon.



A 2006 study in NWT's Nahanni River drainage, close to Yukon's southeast border, found five species: the Western Long-eared Bat, the Long-legged Bat, the Little Brown Bat, the Northern Long-eared Bat, and the Big Brown Bat. The presence of two more bats, the Hoary Bat (*Lasiurus cinereus*) and the Eastern Red Bat (*Lasiurus borealis*), was suspected.

With more research, along with changes in climate, how many more bat species will we discover in Yukon in the years to come?

The Hoary Bat is the greatest migrator of Canadian bats. It weighs 30 grams, the weight of four loonies.





- Why do bats hang upside down?
- There are many theories as to why bats evolved the unique ability to hang upside down. What do you think?
- To be able to fly, these mammals had to reduce the weight of their hind limbs. This may be why they can't walk, run or stand.
 - It makes it easy to scan, drop and glide into flight.
 - It allows them to roost safely out of the reach of predators and in a group, preserving body heat.
 - Their hind feet lock tightly using only the weight of the body. No muscles or energy are involved. Bats can hibernate or go into torpor without fear of falling.
 - Their hind feet have five toes and their front only have thumbs.
 - It is an adaptation that allowed bats to fill an unused niche (place in nature) for roosting.

Want to learn more?

Books

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In Austin, Texas, Bat Conservation International and citizens rallied to save a colony of Mexican Free-tailed Bats by preventing the destruction of a bridge. Now, the Batfest and viewing of three-quarters of a million bats contribute to the economy by drawing millions of tourists per year. (©Karen Marks, Bat Conservation International)

Find out more on how you can help bats at www.batcon.org.



For free distribution only.

www.wildlifeviewing.gov.yk.ca

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