



The Leaflet

Change and Not-change

By Jim Fyles

Fall 2019

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Change is a curious thing. I first started coming to the Arboretum 30 years ago. For all those years, I have visited and enjoyed its open green vistas and its cozy shaded corners in every season. As a teacher and researcher, I have collected observations and all sorts of data, everywhere. When I look closely at the Arboretum, much has changed. Saplings have become trees; trees have become logs on the ground; logs have disappeared into the soil. But from a distance, much has stayed the same. The woods are woods; the fields are fields; the trees arching over shaded pathways still arch; the sounds of woodpeckers and spring peepers still echo. Change and not-change are integral to the Arboretum's nature.

This spring saw change and not-change in the administration of the Arboretum. After being the Director since 2008, I decided to step down as I prepare for my forthcoming retirement from McGill. My colleague Benoît Côté has generously agreed to take up the mantel in my absence.

Benoît and I were hired in the same year and have worked together on many projects. He is an ecologist, tree physiologist and a forester. He brings to the Arboretum a vast knowledge of forests and forest management, along with 30 years of activity on site, including a decade as Director. He teaches courses in integrated forest management, and you have likely seen him with his students exploring the Arboretum at any time of year. My sense is that Benoit is a firm believer in the idea that sending students out into the deep snow to measure trees is essential to their professional training and, I suspect, to building their character. I am happy that Benoit has agreed to become Director. With Benoit collaborating with our staff and volunteers, the Arboretum is in good hands.

That said, I am not disappearing. Peering ahead into the mists of retirement, the Arboretum is a bright spot of clarity for me. Over the years, I have been inspired by our many volunteers who have donated some of their well-deserved retirement to projects in the Arboretum. I am looking forward to following in their footsteps. The opportunities are many. Perhaps I will even get to guest author an article or two for the Arboretum newsletter. And having more time to walk, ski and consider how the trees still arch and the late afternoon light still filters through the canopy will be a gift. Change and not-change.



Witch-hazel: a native shrub that flowers in November, in Blossom Corner

See you on the trails!

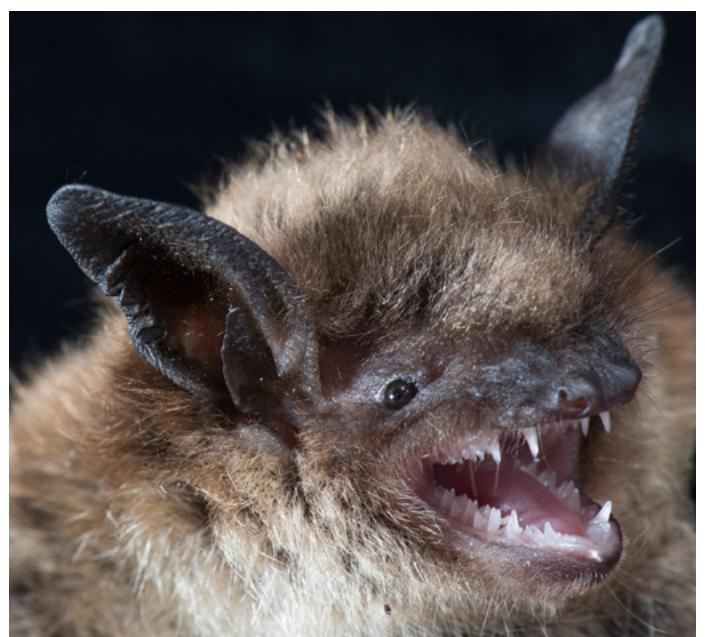


Going Batty?

By Hannah Legault, Communications Assistant

A Big brown bat in flight

If you read the title of this and weren't intrigued... I encourage you to read on. As my contract comes to its end at the Arboretum, I have been reflecting on what I have learned and what the community has learned about me. Many have witnessed my passion and excitement when discussing birds, plants, trees, and practically anything outside or taking place in the Arboretum. What few know is that my study of wildlife began with bats as a research assistant, and my first training shift was right here in the Arboretum! Bats are one of the most misunderstood mammals: the majority of common knowledge is based on myths, coupled with fear and disgust. If you read on, I hope that this short article will inspire you with the magic and intrigue that bats have to offer, all the while revealing (once again) that I have no shortage of enthusiasm for all things nature.



A Little brown bat smiles for the camera

Why bats?

Bats are important in Quebec for many reasons, chief among which is their ability to eat thousands of insects in a single evening. During my work with bats, I was always told to stress this fact about bats so that they would seem more useful to people, but the truth is bats do a lot more than just help control insect populations. There are other types of bats that eat fruit, but the eight species found in Quebec are all insectivorous. Several species of bat are known to pollinate flowers as well as distribute seeds from plants and trees. Like other pollinators, bats are an indicator species, meaning they signify the health and stability of the ecosystems in which they live. If you are in an area with an abundance of insects, and plenty of tree cover and darkness (know any such places?), and you don't see bats – it might be time to worry about why they aren't there.

Bats are physically interesting: their wings are made of skin, and their bone structure reveals that their wings are in fact hands. The claw that is often visible at the top of a wing is actually the thumb. Their wing skin connects their hands, feet and tail, giving them the ability to fly, but also creating a unique physical attribute that can only be described (at least by me!) as cute. When climbing along a wall their tail and wings make them appear to be wearing parachute pants. Their furry bodies and "snouts" or muzzles give them the appearance of tiny dogs with big ears; especially the Flying Foxes and other large bats found in the Southern Hemisphere. Some species (including several of the ones found in Quebec), have ears that look remarkably similar to our own. Bats are unique, helpful, and immensely interesting to learn about.

Bats at a Glance

Bats are the only mammals that can fly. They belong to the taxonomic order - a way of categorizing living things based on key features - called Chiroptera (roughly translated from Latin meaning "hand-wing"). They are further divided into Macro-Chiroptera (tiny dog faces with big eyes like Flying Foxes and other fruit-eating bats), and Micro-Chiroptera (smaller noses and "muzzles" like the bats found here in Quebec).



Experimental bat houses in the Branchery Field

What Bats live at the Arboretum?

I learned about echolocation while recording in the Arboretum. These sonogram recordings can be used to identify which species of bat are in a particular environment, as each species calls at different enough frequencies and with a distinguishable pattern. The person who trained me was a McGill University PhD student, Amélie Fontaine, whose work furnished the Arboretum with a collection of bat houses, currently located in the Branchery Field, off the Orange Trail. Her studies seek to establish which orientation and design of bat house best reflect the needs of the *Myotis* genus bats, two of which are endangered here in Quebec. Often, the bat houses have stood unoccupied, although we once surprised a solitary male while changing the temperature data recording device inside.

During my work as a research assistant, Amélie took me under her wing (pun entirely intended) and showed me how to find and record bats who were hunting in the Arboretum. The sonogram recordings we took in 2017 revealed that at least three species of bats hunt in the Arboretum: Big brown bats, Little brown bats, and the Northern long-eared bats, the latter two of which are endangered. The presence of bats in the Arboretum is a good sign and means that these bats are here playing their ecological roles, including mosquito control. It is of course possible that any of the other five species of bats resident to Quebec could be living in the Arboretum, but further study is required to confirm their presence.



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Pharmacien-propriétaire

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Habitats & Behaviour

Bats are nocturnal creatures who hunt insects using echolocation. They tend to be found in areas with bodies of water, such



A 3 days old Big brown bat

as lakes and ponds that attract large numbers of insects. Almost all of the species of bats in Quebec stay at one location during the summer to reproduce and raise offspring, and will then move to a hibernaculum to overwinter. Most species show fidelity to their hibernating and maternity sites, meaning they often come back to the same locations every year. Big brown bats occasionally stay in the same roost year-round, although this is uncommon.

Some species of bats are known to roost in human dwellings, but the development of more “wildlife proof” building construction has limited bats’ access to their usual roost sites.

Bat Fact:

The Hoary bat, a species found in Quebec, uses an echolocation frequency low enough that a human with perfect hearing would be able to hear it without using a listening device or a sonogram.



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Issues

Unfortunately, a disease called white-nose syndrome, or WNS, is wiping out bat populations across North America. WNS is caused by a microscopic fungus that grows on the exposed skin of a bat, causing an

infection, which wakes it up during hibernation. Each time a bat wakes up, it uses up valuable fat reserves required to survive the winter, when insects are scarce. Species with smaller bodies have fewer fat reserves and are therefore more likely to succumb to starvation than the larger ones, which is why this disease has been so detrimental to certain species, causing major population drops after every winter.

The disease has spread to the point that three out of eight of our native bat species are now officially endangered: the Little brown bat, Northern long-eared myotis, and the Tri-coloured bat or Eastern pipistrelle. If you have not heard of it already, a quick search will reveal years of plunging population numbers. For the Little brown bat, an emergency study conducted in 2012 revealed a population loss of more than 75% in only six years.

It is widely believed that WNS has been spread by humans, visiting caves in which the fungus is found and bringing contaminants into unaffected areas. In human-modified environments (urban, suburban and rural areas), habitat loss, pesticide use, and the loss of potential roost-sites adds to the struggle of our bat populations.



A Red bat with a Motus tag,
a device used to track animal movements



A pair of Hoary bats pictured as they fly and dive for insects

What can you do to help bats?

Education and myth busting go a long way towards encouraging people to see bats in a more positive light and recognize how beneficial they are. Educating yourself about the wildlife with which you share an ecosystem and the risk of exposure to rabies will help keep you, your family, and your pets safe. The website BatWatch.ca holds a wealth of information on the subject of bats, and we welcome you to visit the site to find out more. Here are a few of their suggestions as to how you can contribute to bat conservation:

- Give the bats a place to live: keep old trees that are still standing and keep an uncut margin of trees next to bodies of water.
- Install a bat house: they come in a variety of shapes and sizes, and information about installing one can be found online. Bats don’t always move in right away, but leaving your bat house up for many seasons increases your chances of success.
- Limit the amount of light coming from and around your home at night.
- Refrain from removing bats from their habitation between the months of May to the end of September: during these months, bats have babies inside the maternity colony and blocking entrances may exclude the adults while trapping the young inside.
- Refrain from visiting caves in the winter: hibernating bats are sensitive to disturbances, and already facing big challenges due to WNS. Avoiding disruptions to their hibernation will give them a better chance of surviving.
- Stop the spread of pesticides, and avoid using them on your property: bats eat thousands of insects each night, and pesticides can build up in their system and weaken their health.



A Little brown bat in flight

The birds of the Arboretum are fed by



<https://pqspb.org/bpqpoq>



A silver-haired bat with a Motus tag

Because streams and wetlands are good foraging territory for bats, you can ensure their safety by helping clean up waterways in your area.

• Educate people around you on the condition of bats: help spread the word that we must support the bats, which will in turn continue to help us.



An Eastern small-footed bat with a wristband

An Eastern small-footed bat with a wristband

To find out more about bats and WNS, watch the USDA Battle for Bats video or consult the website maintained by the White-Nose Syndrome Response Team, an interagency collaboration across Canada and the United States. 

Quebec's Bat Species

By Hannah Legault, Communications Assistant

Eight species of micro-chiroptera bats call Quebec home. Enjoy these species' unique characteristics, and learn more about these tiny neighbours who clear the sky of insects at night.



A Hoary bat hangs from its perch

Big brown bat

Grande chauve-souris brune *Eptesicus fuscus*

Description: Females are a little bit larger than males. Fur on the back ranges from tan to chocolate brown, and the stomach fur is lighter. The face, ears, wings and tail are black.

33, rue St-Pierre
Ste-Anne-de-Bellevue (Québec)
H9X 1Y7

Tél.: (514) 457-5731
Fax: (514) 457-5731

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Description: Little brown bats appear to be the classic North American bat. They have a wide range of fur colours, from dark to golden brown, reddish and olive brown and their wings and tail are dark brown or black. They have tall and narrow, slightly pointed ears.

Found at the Arboretum? Yes!

Wingspan: 33 cm

Average Lifespan: up to 19 years

Cool Fact: In torpor (hibernation), the heart rate of a Big brown bat can be as low as 4 bpm, and in short flights can increase to 1097 bpm.



An Eastern pipistrelle

Eastern pipistrelle/Tri-coloured bat

Pipistrelle de l'Est *Pipistrellus subflavus*

Description:

The nickname "tri-coloured" is derived from the colouration of the individual hairs covering this bat's body. Each hair is dark at the base, yellow in the middle, and dark at the tip. The "fingers" in the wings of this species are lighter than the wing membrane too – a unique look compared to other species.



Portrait of an Eastern pipistrelle

Found at the Arboretum? Not yet

Wingspan: 22-25 cm

Average Lifespan: 4-8 years

Cool Fact: These bats are at the northern end of their territory in Quebec: their territory ranges to Central America.

Little brown bat

Petite chauve-souris brune *Myotis lucifugus*

Description: Little brown bats appear to be the classic North American bat. They have a wide range of fur colours, from dark to golden brown, reddish and olive brown and their wings and tail are dark brown or black. They have tall and narrow, slightly pointed ears.

Found at the Arboretum? Yes!

Wingspan: 22-26 cm

Average Lifespan: 6-7 years

Cool Fact: Myotis is from the Greek word for "mouse-eared." Little brown bats enter daily torpor – they "hibernate" during the day, and they use the air temperature to indicate when they should wake up. Little brown bats are incredibly quick eaters: they chew 7 times per second, and digest a meal in less than an hour.

Eastern small-footed bat

Chauve-souris pygmée de l'Est *Myotis leibii*

Description: The Eastern small-footed bat has a completely black facemask and ears, giving its face a unique look. The name comes from their size: the feet are the only ones of similar species that measure less than 9 mm. Their hairs are black at the base and shiny brown at the tips, giving their back a glossy appearance.

Found at the Arboretum? Not yet

Wingspan: 21-25 cm

Average Lifespan: 6-12 years

Cool Fact: These bats are one of the rarest species in North America. They fly very low to the ground (only 30 cm to 6 m above ground) which is often how they are distinguished. Another of their unique features is that they hibernate horizontally.



A Northern long-eared bat flying

Hoary bat

Chauve-souris cendrée *Lasiurus cinereus*

Description: The biggest bat found in Quebec, the Hoary bat's body is still only the size of a fat mouse. They have arguably the fanciest fur of the bats found in Quebec: a black tipped-muzzle and ears, a yellow/honey head, and white tips on their fur (hence the common French name "cendrée," meaning "frosty or ash coloured").

Found at the Arboretum? Not yet

Wingspan: 43 cm

Average Lifespan: about 2 years

Cool Fact: Hoary bats have a huge geographic range, from the tree limit in Canada to South America, and they are the only bats found in Hawaii.

Red bat

Chauve-souris rousse *Lasiurus borealis*

Description: The Red bat varies from brick red to a yellowish-red in fur colour, but each hair has white at the tip giving a frosted appearance. Males tend to be more red in colour while the frosted look is more prominent in females.

Found at the Arboretum? Not yet and not likely

Wingspan: 33 cm

Average Lifespan: up to 12 years

Cool Fact: Unlike most of the other species found in Quebec, female Red bats have four mammary glands (where others have two).

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The photos of bats in this article were generously provided by Brock and Sherri Fenton. Brock Fenton is Professor Emeritus in the Department of Biology at Western University in London, Ontario. He has advanced the study of bats throughout his career and authored many books about them. We thank Brock & Sherri sincerely for their many contributions to the knowledge of bat populations worldwide.

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Morgan Arboretum

21,111 Lakeshore Road P.O. Box 186
Macdonald Campus

Sainte-Anne-de-Bellevue, QC, H9X 3V9

Tel.: 514-398-7811

Fax: 514-398-7959

Email: morgan.arboretum@mcgill.ca

Web Site: www.morganarboretum.org

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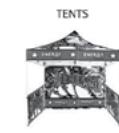
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