



Canadian Bat Box Project Newsletter, October 2023

Welcome to the sixth newsletter for the Canadian Bat Box Project! This past summer was the final field season for this 3-year project, but we are brainstorming research directions based on the results of this study. Even though the project in its present form is ending, I can still add records to my database of when bats return to your bat box next spring as the final publication of results is still at least a year or two away. Also be sure and let me know how late into the fall bats stay in your bat boxes! We got our first batch of guano results this past June, as discussed in the ‘Summer Results’ article below. We expect to get our second batch of guano results next June.



CANADIAN WILDLIFE
FEDERATION
FÉDÉRATION
CANADIENNE DE LA FAUNE

We have started receiving microclimate loggers back from everyone who had one, and we will be looking at these data this coming winter. If you have loggers in your box, don’t forget to remove them and mail them back to us! Given the volume of data still coming in, this issue will not be the last issue of this newsletter as I want to ensure I keep everyone updated on project progress.



The Canadian Wildlife Federation is looking for an individual or business who can build bat boxes based on the results of our project. Many of the bat boxes commercially available at nature stores and farmer markets across Canada are too small to be effective for bats. Affordable, effective bat boxes can be difficult to find. If you know of anyone who may be interested in producing bat boxes on a commercial scale, please contact James Page: [jamesp\[at\]cwf-fcf\[dot\]org](mailto:jamesp[at]cwf-fcf[dot]org)

To date we have received 1,491 survey responses from across Canada, including all provinces and almost every territory. Very impressive – thank you to all who submitted!

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For those who have not yet [registered](#) your bat box with the [program](#), please do – your information adds a valuable component to this nation-wide project! The surveys will remain open until spring 2024. Please consider contributing an article, pictures, or an article idea to this newsletter by emailing Karen Vanderwolf: [kjvanderw\[at\]gmail\[dot\]com](mailto:kjvanderw[at]gmail[dot]com)



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Funding for this project was
provided in part by the
Government of Ontario.



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NEW BRUNSWICK MUSEUM
MUSÉE DU NOUVEAU-BRUNSWICK

Thanks to James Pagé for editing the newsletter.

Summer Results by Karen Vanderwolf

I was able to visit some of you in New Brunswick and Ontario this past summer to check out your bat box(es) and take samples. Thank you to everyone for your hospitality and enthusiasm!

The photo to the right, taken by Debbie Gray in Ontario, shows, from left to right, Lucas Greville, Lily Hou, and I checking out two bat boxes with a little brown bat colony.

Visits by myself and other colleagues this past summer resulted in 44 swab samples of bat boxes to test for the fungus that causes white-nose syndrome. All samples were negative, so it does not appear that bat boxes are a major environmental reservoir involved in the transmission cycle of the fungus. Good news!





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We received results on bat species identification based on molecular analysis of all the guano samples participants mailed to us as of October 2022, as shown in the table below. The table shows the number of bat boxes with each species by province. There were a few samples in British Columbia where the identification was uncertain. The lab will perform further analysis on these samples to resolve the identification issues. Outside of British Columbia, only Little Brown Myotis and Big Brown Bats use bat boxes, which means the other seven bat species that live east of British Columbia do not appear to use bat boxes. Some bat boxes harbored both Little Brown Myotis and Big Brown Bats, but multi-species colonies cannot be detected through our guano analysis protocol since the lab only analyses one guano pellet per samples. These colonies were identified by professional biologists and therefore the occurrence of multi-species colonies in bat boxes is likely higher than these data suggest. The endangered Little Brown Myotis is the most common species using bat boxes in most provinces.

Province	Little Brown Myotis	Big Brown Bat	Little Brown & Big Brown	California Myotis or Western Small-footed Bat	Little Brown Myotis or Long-eared Myotis	Yuma Myotis
Alberta	78	14	6	0	0	0
British Columbia	1	1	0	2	3	1
Manitoba	3	0	0	0	0	0
New Brunswick	5	1	0	0	0	0
Newfoundland & Labrador	14	0	0	0	0	0
Northwest Territories	0	0	0	0	0	0
Nova Scotia	12	0	0	0	0	0
Ontario	78	39	3	0	0	0
Prince Edward Island	13	0	0	0	0	0
Quebec	5	1	0	0	0	0
Saskatchewan	3	8	5	0	0	0
Yukon	15	0	0	0	0	0
Total	215	64	14	2	3	1

Participants came through this summer and submitted lots of bat count data from their bat boxes! To the left of the dotted line, the table shows the number of boxes with and without bats; 38.7% of bat boxes registered with our project currently have bats or had bats in the past. To the right of the dotted line, the table below shows the maximum number of bats (organized by category) counted in each bat box by province. The majority of boxes had fewer than 10 bats. Large colonies of bats will use bat boxes, but it is relatively rare in Canada. Thank you to everyone for submitting count data! It's not too late to submit more count data if you have not yet done so. Just email me or fill out this [short survey](#).



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Province	Total Boxes	% Occupied	No Bats	Bats Present	Bats present, but unknown number	<10 bats	10 to 49 bats	50 to 99 bats	100 to 200 bats	>200 bats
Alberta	175	72.0	49	126	11	60	36	12	5	2
British Columbia	88	48.9	45	43	12	24	3	2	0	2
Manitoba	44	29.5	31	13	5	3	5	0	0	0
New Brunswick	199	16.1	167	32	10	16	5	0	0	1
Newfoundland & Labrador	19	73.7	5	14	2	0	3	4	3	2
Northwest Territories	1	0.0	1	0	0	0	0	0	0	0
Nova Scotia	75	44.0	42	33	10	14	2	6	1	0
Ontario	647	34.3	425	222	50	94	37	33	7	1
Prince Edward Island	43	41.9	25	18	7	3	1	7	0	0
Quebec	76	23.7	58	18	5	11	1	0	0	1
Saskatchewan	46	47.8	24	22	1	16	5	0	0	0
Yukon	25	60.0	10	15	0	11	2	1	0	1
Total	1438	38.7	882	556	113	252	100	65	16	10

Bat-Friendly Communities by Emina Lai, Undergraduate student, University of Ottawa

Bats may just be the unsung heroes of our night skies, assisting with insect control. However, even heroes need a helping hand. With human threats to bats from wind turbines, the destruction of roosting and foraging habitat, and pet cats on the rise in many regions, bats are up against a world of challenges. What makes this situation even more concerning is the slow reproductive rate of bats, rendering them particularly vulnerable to these threats. Many bat species coexist with human communities, and some like the little brown bat rely heavily on human structures for roosting. Therefore, it's vital to manage and protect bat populations near or within our cities for their continued success.

To protect the bats of British Columbia (BC), the Northeast Community Bat Program and the BC Community Bat Programs put together the [Bat Friendly Communities Program](#). Bat-friendly communities must encourage bat appreciation, bat-friendly management information, and bat-friendly spaces within cities. The program offers a certification to any city that [fulfills the requirements for being bat-friendly](#) and six communities in BC are officially bat-friendly as of



2023. The most recent addition is Comox, marking the first city on Vancouver Island to be bat-friendly!

So, what exactly does it take to become certified? The three main components needed to become certified are to create and protect habitats, provide information, and promote learning about bats. First, the city needs to pinpoint [bat habitats that can be enhanced or better protected](#). Some examples could be buildings with roosting bats, local wetlands, and creeks.

The town of [Comox](#) being presented with their bat-friendly certification



Communities also need to install and monitor at least one bat box or protect at least one existing colony. Additionally, other activities to preserve bats are required such as planting bat-friendly gardens and cottonwoods, a fast-growing tree found across Canada that often produce cavities for roosts.

Information about bats also needs to be available in city hall. The BC Bat community has brochures that can be printed and made available to the public at their city desk. Proper bat management guides must also be distributed alongside building permits and building licenses.

Last but not least, cities need to promote learning about bats! Bloodsuckers, hair grabbers and disease carriers... bats do not have the best reputation among the public despite the important ecological role they play in insect control. To promote giving love to our furry flying friends, cities also need to adopt Bat Week as promoted by Bat Conservation International. Bat-related activities at daycares, schools, or libraries must be encouraged, and there needs to be at least one sponsored bat-related event. Once all these



[Bat information booth](#)



requirements are complete, the city will be awarded a ‘bat-friendly community’ certificate and an acknowledgement on the BC bat website and Facebook page.

Apart from cities within BC, no other communities in Canada receive certification or acknowledgement for creating bat-friendly communities. Fostering bat-friendly communities isn’t just preserving bats, it’s preserving the delicate balance of our ecosystems. Awarding a shiny certification for being bat-friendly is a great way to encourage actions that work towards protecting bats!

Turn Off the Lights for Bats by Natalia Sandoval Herrera

Natalia completed her PhD at the University of Toronto on the effects of pesticides in tropical bats, and her MSc at the University of Costa Rica. She is currently a postdoctoral researcher at the Swedish University of Agricultural Sciences.



Bat populations are vulnerable to many human activities, including habitat destruction, wind turbines operation, climate change, agrochemicals, and a new growing threat, light pollution.

Light pollution is caused by excessive artificial light produced by human activities for safety and security, economic reasons, and aesthetics. These include illuminated (advertising) signs, streetlamps, car lights, and lighting of buildings. In cities in industrialized countries, artificial light at night is so ubiquitous that even the brightest stars are no longer visible. It is a growing problem in many parts of the world and significantly impacts nocturnal wildlife, especially bats. Bats are adapted to find prey in the dark, which also helps them avoid predators. Therefore, artificial lightning at their resting and feeding sites can be very disruptive and threatening.

Artificial light [affects bat species differently](#). Light-tolerant bats, mainly fast-flying species, may opportunistically feed on insects attracted to streetlamps; however, this light exposes them to predators like owls and hawks. Slow-flying species, on the other hand, might be more sensitive to light, avoiding lit areas altogether and being forced to change their commuting routes and feeding sites. The presence of lighting near a bat roost can lead bats to leave their roosts and search for new habitats to live in. Artificial light can also disrupt bats’ navigation and feeding patterns, making it difficult for them to find food and mates. For example, artificial light can prevent bats from noticing nightfall or emerging from their roosts, which delays their feeding time and limits insect availability.

Light pollution can have serious consequences for bats’ survival. It can cause bats to become disoriented and fly into buildings or other obstacles, leading to injury or death. Artificial light



can also disrupt their internal clocks and affect their ability to reproduce, leading to a decline in their populations.

However, it is not all bad news; [a recent study](#) suggests that when used appropriately, artificial UV lights can actually serve to enhance foraging habitats for vulnerable species, such as those impacted by White-Nose Syndrome (a deadly disease caused by a fungus). UV lights attracted insects to their hibernacula, aiding sick bats to survive the winter and cope with the disease.

Preserving naturally dark roosting and feeding sites, connected by dark corridors, is essential for bats. To protect bats from the harmful effects of light pollution, it is important to use light responsibly. This can include:

- Do not directly shine lights on bat roosts
- Using motion sensors or timers to reduce the amount of light produced at night.
- Shielding outdoor lights to reduce glare and direct light downwards where it is needed while minimizing illumination of roosts, trees, and the sky
- Turning off unnecessary lights when they are not in use.
- If lights are needed, use low-intensity red or amber lighting, installed at least 50 m away from bat habitats.
- Using warm-colored LED lights, such as red, instead of cool-colored lights in the blue spectrum. Ultraviolet wavelengths attract more insects.

Dim your lights and help your neighbor bats!

Go Dark!
Turn off outdoor lights at night

Use Lights Wisely
Use timers or motion sensors to turn off the light

Use Warmer Colored lights
Avoid UV and blue lights

Face Lights Downward
Proper shielding for street lamps

Very bad Bad Good Very good

Illustration created with BioRender.com



As individuals, we can also help by spreading awareness about the dangers of light pollution and supporting bat conservation efforts. Some ways you can help include:

- Educate others about the importance of bats and the impact of light pollution on their populations
- Supporting organizations that work to protect bats and their habitats.
- Providing roosting sites for bats in dark areas of your yard or community
- Visit and support [Dark-Sky Preserves](#).

Together, we can work to protect bats and ensure that these important creatures continue to thrive in our environment.

Killbear Provincial Park Bat Boxes by Shannon Taylor

Shannon is a Park Naturalist from Killbear Provincial Park and a recent graduate of the Ecological Restoration program at Fleming College and Trent University. Her curiosity for bats guided her to lead emergence counts in the Park for the last 3 seasons to find out more about the population.

Bats are bustling with life throughout Ontario Parks! Nestled north of Parry Sound, Ontario, [Killbear Provincial Park](#) has been a hotspot for many bat residents. Our staff have been taking part in emergence surveys for the past three seasons with great success. Our journey began with the installation of two bat boxes near the Park's Amphitheatre in 2017. In 2021, staff began regularly taking part in emergence counts. As the sun began to set, staff would set up chairs and count the number of bats that exited and entered the boxes. We quickly realized that the boxes were well used. The bat's positive response to our boxes motivated us to expand our efforts. The decision to add 14 more boxes was guided by bat sightings throughout the park.



After finding several bats in the attic of a park building, efforts were made to move them out of the building. In addition to installing one-way exits for bats in the attic, 12 bat boxes were installed nearby to offer a variety of roosting sites. Due to their success at the amphitheatre, both a rocket box and a 4-chambered design were chosen. Each box was placed facing south, giving



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the boxes lots of sunlight throughout the day, creating a warm, safe haven for bats. Staff members volunteered their time throughout the summer to participate in several emergence surveys on the newly constructed boxes with many boxes holding 30 or more bats on a single night.

This season, Discovery Staff were able to lead an evening program on bats and were thrilled with the turnout! Hundreds of visitors flocked to the Amphitheatre to learn about the diverse species of bats in Ontario and what they can do to help them out. Outreach and education are vital components of our mission. We believe that public awareness is essential to maintain ecological integrity. Visitors were excited to share stories of bat encounters they had at the park in years past, and jumped at the opportunity to watch the bats fly from the nearby boxes. In the future, we are eager to continue our bat conservation efforts, which include installing more boxes and having visitors take part in bat monitoring efforts.



Our bat conservation journey has not come without some challenges, as we currently have three boxes that have yet to have any bat residents. We remain hopeful that these boxes will work out in years to come, but their placement may be the cause. These boxes are shaded by nearby trees, lowering the temperature in the boxes considerably. To those embarking on bat box construction, be patient and observe the bats in your area. We believe that trial and error is all part of the process.

As the seasons change and bat activity slows for the winter, we are reminded of the impact

collaborative conservation efforts can have on the natural world. Bat conservation and protection is a team effort and Killbear has been grateful for the support of the teams at the Canadian Wildlife Federation, the University of Waterloo, Myotistar, Shawanaga Species at Risk, and Ontario Parks. Together, we can create safe spaces for bats in our backyards and our protected green spaces. The rewards of building boxes are well worth the wait.





Bat species diversity and health risks put into context by Jordi Segers



Jordi Segers is the national bat health program coordinator with the [Canadian Wildlife Health Cooperative \(CWHC\)](#). The CWHC conducts bat health surveillance and knowledge mobilization to provide guidance to those in Canada responsible for managing bat species. The primary objective of the national bat health program is to promote healthy, resilient, diverse, and self-sustaining bat populations in Canada.

What is a bat? We often speak about bats like they are one animal, or like they can be represented with a single statement.

However, there are over 1400 different bat species around the globe, each unique in where they live, what they feed on, and what important roles they play in the ecosystem. Being so numerous in species diversity, the only other group (technically called “order”) of mammals more diverse than bats are the rodents with over 2000 species.

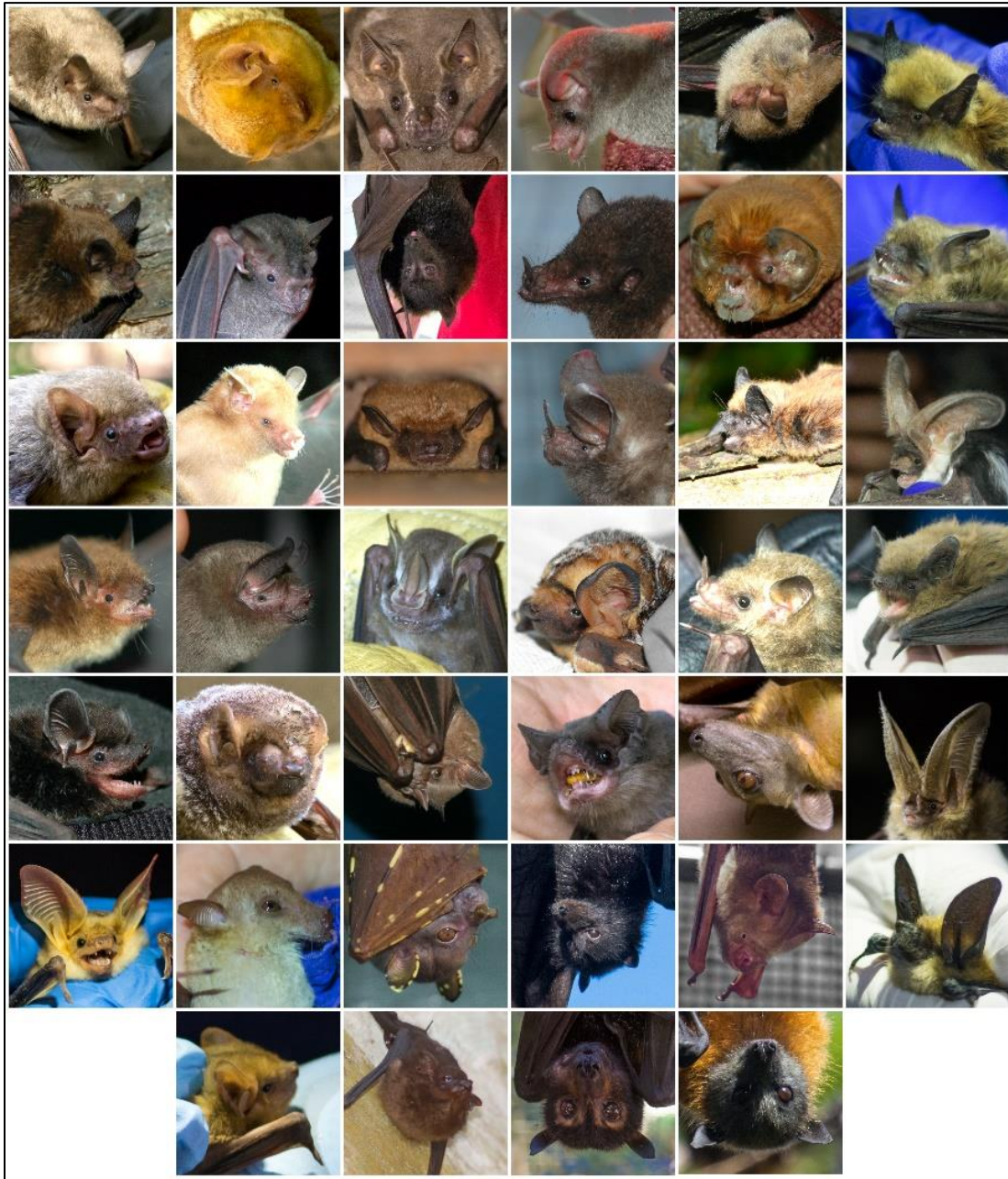
Referring to bats when we really mean to speak about one particular species is like talking about rodents when we are only trying to discuss guinea pigs. Sometimes it is correct to talk about bats collectively, but too often this is done incorrectly, providing misleading messages about this group of mammals.

Bats around the world often get a bad reputation due to their association with diseases. The truth is that most wildlife can carry diseases that could be passed on to humans (zoonotic diseases) and the more diverse a group of animals is, the more diverse their disease ecology is. Thus, 1400 bat species are bound to carry some diseases of importance to human health, and this very thing has been studied by scientists. A [study published in 2020](#) concluded that the number of zoonotic diseases carried within a group of animals is proportional to the species richness within that group of animals. Therefore, they suggested that both the orders of bats and rodents are unexceptional as zoonotic reservoirs when compared to the orders of other species.

The global media publishes many articles describing zoonotic diseases of bats affecting humans around the world. While these stories report that the disease has been traced back to bats, often bats are blamed in cases when there is no evidence of them being the source of the disease in question. Regardless, this should be put into perspective. Some zoonotic diseases are highly host species specific, being transmitted by one or a few bat species in a small part of the world. It is important to note that this most often happens in unique circumstances that are related to the destruction of the natural habitats. When these natural habitats are destroyed, bats are forced to move into areas they typically would not choose otherwise, often bringing them in close proximity to humans. In these cases, there may be an increased possibility of transmission of diseases between bats and humans. An example of confusing reporting can be found in [a](#)



[Canadian news article](#) covering a zoonotic disease associated with the Indian flying fox, a species of fruit bat in India, where an expert is quoted stating, "If you look at where the bat home range is, it's massive," he said. "There are lots of areas for potential spillover events and lots of people living in the area of the geographic range of the bat." The lack of specificity can unfortunately promote public fear of bats in regions of the world, such as North America, where that particular bat species and the disease are not even found.



Collage of 40 different bat species from around the world, including from North America, Central America, the Caribbean, Australia, and Africa



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In Canada, we have about 17 different bat species. The only reported zoonotic diseases associated with Canadian bats are rabies and histoplasmosis. Although infection with either of these diseases in humans in Canada is extremely rare, the risks do need to be taken seriously, but can also be mitigated in most cases.

All mammalian species can contract and potentially spread [the rabies virus](#), and bats are no different. However, very few bats in Canada carry rabies, likely less than 1% of all bats, but it is often impossible to tell if a live bat has rabies. Rabies is transmitted through the saliva of an infected mammal, typically through a bite or a scratch. Direct contact with any wild animal should be avoided whenever possible. If humans, our pets, or other domestic animals (like horses and cows) do come in contact with a bat, public health or a veterinarian should be consulted to assess whether any steps should be taken to protect human and animal health. A public health official or veterinarian may recommend post exposure prophylaxis (vaccination), in essence, treatment against rabies that can be administered after potential exposure to the virus. However, ideally any physical contact with bats is avoided altogether, a good general rule of thumb for all wildlife species.

[Histoplasmosis](#) is a disease that can be contracted from breathing in fungal spores that may be present in bird or bat droppings, also known as guano. It is not well understood where this fungus occurs in Canada so precautions should always be taken. Larger accumulations of guano in poorly ventilated spaces, such as inside attics, should be avoided to minimize risks. Of course, large colonies of bats can produce large quantities of guano, but there are appropriate ways to regularly dispose of these droppings, allowing bats to live in close proximity to humans (including attic spaces). See the [CWHC's histoplasmosis fact sheet](#) for details. As long as bats and their droppings cannot enter the living spaces of our houses and the volume of bat droppings in attics are managed yearly, people and bats can live in close harmony with each other without any significant health risks.

Guano can accumulate under bat boxes as well, especially if the bat box is occupied by a large colony. The risk of contracting histoplasmosis is greatly reduced in ventilated spaces, so bat boxes typically pose little risk. However, it is still recommended to not unnecessarily dig around through piles of guano or the soil around it. Keep children and pets away from accumulations of guano under bat boxes and clean up guano if otherwise it becomes unmanageable.





Even though individual species of bats do not appear to carry more zoonotic diseases than other animals belonging to different groups, there are some ways in which the biology and ecology of bats are unique when it comes to disease transmission. Bats are the only flying mammals and this makes them highly mobile and able to reach places many other mammals cannot. Additionally, all Canadian bat species are relatively small, especially those species that tend to live in our attics or bat boxes. The little brown myotis is obviously little, but despite its name, the big brown bat is not much bigger. Their small, flying bodies allow these bats to very easily crawl through tiny holes and accidentally enter our living spaces. As mentioned before, bats can live in harmony with humans as long as they don't share a physical indoor space, but once that boundary is crossed, it is very important to [act appropriately and prevent it from happening again](#). The small size of bats as well as the affinity of some species to roost in buildings increases the chances of them coming in contact with us and therefore may elevate the potential for bats to transmit zoonotic diseases above that of non-flying animals.

So, what should you do if you find a bat in your house? If a bat may have been in your bedroom when you were asleep or if any human or domestic animal may have come into contact with a bat, contact public health and your veterinarian to determine the best approach to protect human and animal health. The bat may need to be collected and may need to be humanely euthanized by a professional for rabies testing. Note that many bat species are regionally or

federally protected and thus any assessment should only be done by public health and wildlife professionals. If a bat is flying or roosting inside a living space but there was absolutely no contact between the bat and a human or pet, there are [ways to safely get the bat outside](#).

If a bat is found dead, whether it is indoors or outdoors, prevent direct contact with humans and domestic animals and [contact your Canadian Wildlife Health Cooperative regional centre](#) to inquire about carcass submission. Examination of bat carcasses can provide us with lots of valuable information about bat health across species in Canada, which informs wildlife managers on the status of these species and helps us understand how to better protect them. Some provinces and territories offer a bat hotline to help answer such questions (for example: [Atlantic Canada](#), [British Columbia](#), [Alberta](#)), but otherwise contact your provincial or territorial wildlife division.

The vast majority of bats are healthy and safe to be around, but all wild animals need and deserve to be kept at a safe distance so they can fulfill their essential role in the ecosystems across Canada and the rest of the world.

A Myotis bat species flying in the evening sunlight





Bat Boxes Across Canada: pictures with the caption in *italics* are occupied by bats





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*Tiana Phillips
Alberta*



Yukon

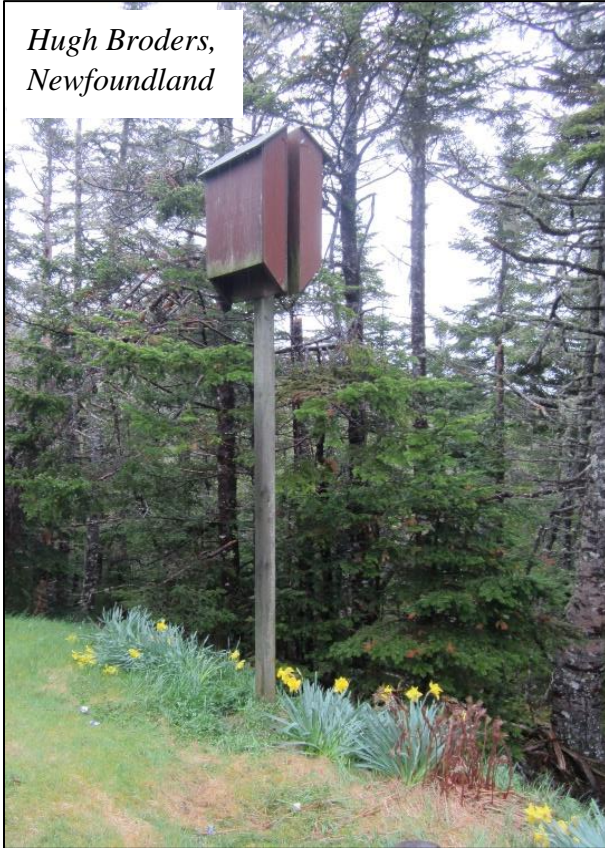


*Matthew Martinuk
Manitoba*



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*Hugh Broders,
Newfoundland*



*Kylie Green,
British Columbia*



Ontario





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