



Canadian Bat Box Project Newsletter, April 2022

Welcome to the third newsletter for the Canadian Bat Box Project! This coming summer is the second of three field seasons (2021 – 2023) for the project. We have been busy mailing out microclimate loggers to many of you and filling in missing information in our database in preparation for analysis.



CANADIAN WILDLIFE FEDERATION
FÉDÉRATION CANADIENNE DE LA FAUNE

We received our first microclimate logger data from bat boxes collected last summer but results on identifying bat species in bat boxes by analyzing guano samples are not expected until this August. All swab samples collected from inside bat boxes in Saskatchewan and Alberta this past fall were negative for the fungus that causes white-nose syndrome. With your help we will be expanding the number of locations we get guano and swab samples this coming summer!

In this Issue:

- Preliminary Results.....2-3
- You can Count on Bats.....4-6
- Gardening for Bats.....6-8
- Concrete Bat Boxes.....8-10
- Bats in Umbrellas.....10
- Bat boxes across Canada....11-14

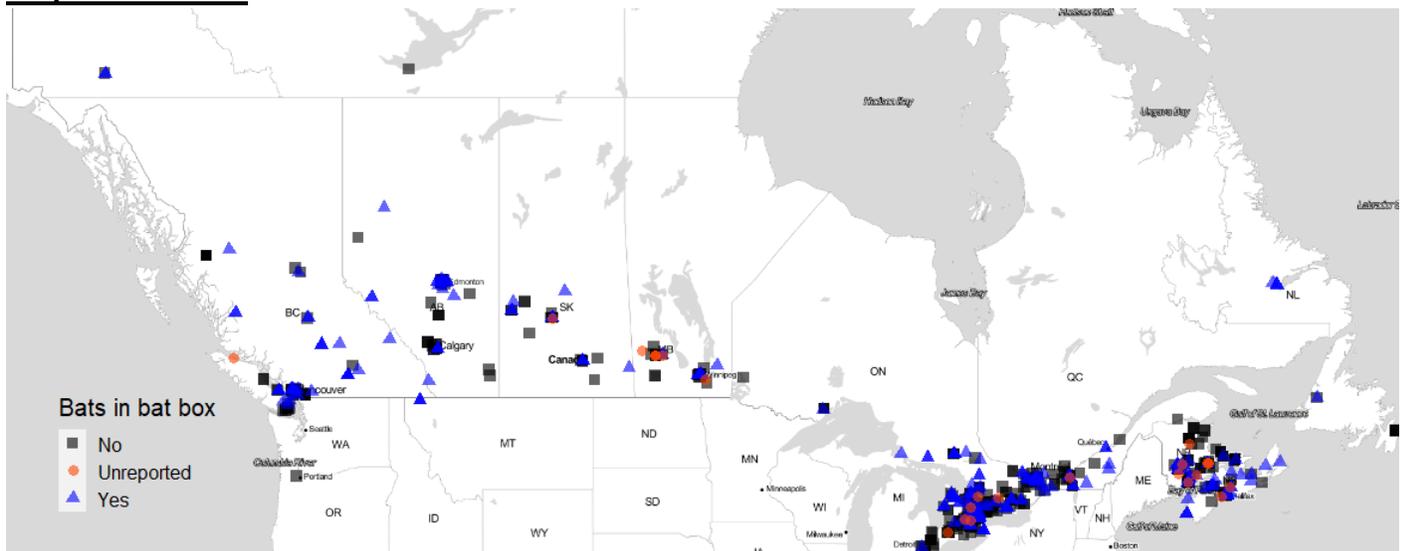
To date we have received over 1,200 survey responses from across Canada, including all provinces and almost every territory.



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! 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)

Map of Bat Boxes



Thanks to our supporters and partners:



Environment and
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Parks Canada Parcs Canada



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



Thanks to Cori Lausen, Jordi Segers, and James Page for editing the newsletter.

Preliminary Results by Karen Vanderwolf

Thanks to your contributions to date, we had a busy winter doing *preliminary* analyses using information from 973 boxes. As more participants become involved and contribute more information, our results will become more robust and patterns may emerge for different areas of the country. So be sure to keep that information coming to give us a better picture over the next two years! The number of survey responses received to date is broken down by province in Table 1. One of the main questions we ask in this project is what characteristics of bat boxes are related to occupancy by bats. So far, a few variables seem to be important, such as what the bat box is attached to, box size, years since installation, and landscape context.

What the boxes are mounted to is important: only 25% of boxes attached to trees had bats compared to 31% of boxes on poles, 45% of boxes on human-unoccupied buildings, and 54% of boxes on human-occupied buildings. Bigger boxes are more likely to be used by bats compared to smaller boxes. Older boxes are also more likely to be occupied, so don't be discouraged if your box is not used by bats in the first few years after installation. Landscape context is also



Canadian Bat Box Project Newsletter, April 2022

important as 49% of boxes in rural forested areas had bats compared to 35% of boxes in rural agricultural areas, 35% in suburban areas, and 13% in urban areas. Other variables, such as box color and what direction the box faces, were not important predictors of bat use. However, 37% of boxes face south and an additional 16% face southeast, meaning the data is skewed.

For occupied boxes, data on the number of bats in each box were available for 163 boxes nationally. Of those, the maximum number of bats observed in each box at one time was 1-10 bats for 63% of boxes, 18% of boxes had 11-50 bats, 15% had 51-100 bats, 2% had 101-200 bats, and 1% had >200 bats. For more information on how to determine how many bats are using your box be sure to read the next article in this newsletter written by Jordi Segers.

Bats do not use bat boxes during the winter and the timing of when bats return in the spring varies by location and bat species. We have reports of big brown bats returning to bat boxes as early as March in southern Ontario and Yuma Myotis returning to some bat boxes in March in southwestern British Columbia, but in many other places May is a good time to look for returning bats. You can report your bat counts and the earliest date you see bats in your box [here](#).

Thank you to all our participants - your input and enthusiasm is fundamental to this project, and I look forward to receiving more data to analyze!

Table 1: Responses to multiple choice survey about the physical characteristics of bat boxes. Not all participants indicated their province.

Province	Number of survey responses	Number of participants with bats in boxes	% of boxes used by bats
British Columbia	76	19	25
Alberta	61	20	32.8
Saskatchewan	49	19	38.8
Manitoba	29	5	17.2
Ontario	430	80	18.6
Quebec	46	7	15.2
New Brunswick	207	18	8.7
Nova Scotia	81	24	29.6
Prince Edward Island	34	6	17.6
Newfoundland & Labrador	10	2	20.0
Yukon	9	4	44.4
Northwest Territories	1	0	0
Nunavut	0	0	0
Totals	1033	189	19.7%



Jordi Segers is the national bat health and white-nose syndrome 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.

You can Count (on) Bats by Jordi Segers

[Installing bat houses](#) is a great way to bring bats closer to your home. The national bat box project will help answer many questions we have about what factors influence the chance of occupancy of bat boxes. In the meantime, you would probably like to know if you have bats living in your bat box and there are several ways you can find out.

An easy way to find out is by shining a light up into your box during the day or putting a white cloth or some other light-coloured, waterproof sheet or board below the box and regularly check for guano (bat poop) deposit. If you find regular new deposits of guano, you can be pretty sure that you have some bats living in the box, but how can you tell how many bats are in your colony?

A colony emergence count is the most effective and accurate way to determine colony size and the more often you conduct these counts the more accurate your estimate will be. Typically, bats will start emerging from their summer roosts shortly after sunset on evenings with nice weather (no rain or fog and temperatures at or above the average for the time of year). Best done in June or July, position yourself in clear, unobstructed line of sight of the bat box about 15 minutes before sunset. Don't take your eyes off the bat box, as the emergence of a single bat can be missed with almost the blink of an eye. It helps to position yourself so that the silhouettes of emerging bats can be seen against the background of the relatively brighter evening sky, as it becomes harder to see bats coming out of a roost as it gets darker. Count every bat that emerges from the bat box, but subtract any number of bats you observe entering the bat box. You may find an app on your phone to be a useful tool (e.g. free [Tally Counter](#); to verify you have clicked the + or – button you can enable sound and use headphones). As more bats start to fly around, it may become difficult to distinguish between emerging bats and circling bats. If you are not sure whether a bat emerged or was already flying around, do not count the bat. The bat count should continue until no bat is seen emerging for 10 minutes after the last one or until an hour after sunset if no bats at all have been seen emerging. If the latter is the case, the bat box may either be unoccupied, or perhaps the weather wasn't so suitable for bats after all. If you suspect bats are



Canadian Bat Box Project Newsletter, April 2022

inside the bat box, try your count again on another evening. Note: count methods may differ slightly when part of regional monitoring initiatives (like the [Neighbourhood Bat Watch](#) and the [BC Annual Bat Count](#)).

While a colony emergence count can give you good estimates on the population size, it doesn't usually tell you what species you are looking at. Acoustic bat detectors can usually help answer this question. These detectors come in different shapes, sizes, brands, and models. In general, there are [active detectors](#) and [passive detectors](#). They detect ultrasonic sounds produced by bats that humans cannot hear.

Active detectors typically make a sound every time they pick up something in the ultrasonic spectrum in which bats echolocate. However, you should be aware that not all such sounds are produced by bats as objects like cell phones or jangling keys can also produce ultrasonic sounds. The [Pettersson D100 Ultrasonic Detector](#) is an affordable active bat detector. The use of active bat detectors can help during colony counts because the sound they make can alert the observer that a bat may be in the vicinity. However, it is very important to still confirm visually that it was in fact a bat and that it came out of the bat box, instead of being a bat or other source of ultrasonic sound that passed by.

Passive bat detectors typically do not make any sounds but quietly record ultrasonic sounds for later analysis (some active bat detectors can also make recordings). A very affordable passive bat detector is the [AudioMoth](#). Recorded ultrasonic sounds have a time and date stamp and can thus be referenced back to visual count observations. Similar to active detectors, visual confirmation that a bat emerged from the roost is essential.



Recorded sequences of bat echolocation calls can be helpful in determining the species of bat as many bat species have uniquely recognizable echolocation call characteristics. It is not uncommon to record bats that are simply passing by and are not known to use bat boxes. A basic understanding of the local bat species and their roosting habits is helpful in determining whether



a recording was of a bat using the local roost or of a species that was merely flying by at the time of recording. Some bat detectors have screens or plug right into your mobile phone, like the [Wildlife Acoustics Echo Meter Touch](#) or the [Titley Scientific's Anabat Scout](#). The latter detector is specifically designed for emergence counts -- it has a built-in tally counter (+ and – buttons) for counting bats while you record and listen to them. The Scout however does not have a screen to see the echolocation calls as they are made like the Echo Meter Touch, so if that is of interest, you might instead consider [Titley Scientific's Anabat Walkabout](#). The Echo Meter Touch and Walkabout give auditory (echolocations converted to audible sounds) and visual feedback (a live spectrogram of the bat call on a screen). The Touch can even suggest what bat species it is recording. Although these automatic identifications are not always correct, it is a fun way to help figure out what bat species you may be housing.

So, grab your favourite beverage, sit down in your lawn chair this summer, and keep your eyes and bat detectors on that bat box. You'll be amazed how beautiful it is to observe the emergence of your very own bat colony, and you'll be thankful for the many insects they'll consume long after you've already gone to bed.

My name is Bailey Bedard from Cornwall, Ontario. I recently graduated from the University of Ottawa with a Master's degree in Biology and a focus on Environmental Sustainability. I worked as a research assistant studying bats throughout the summers of my undergraduate degree which led me to my Master's thesis on Eastern Ontario bats and their high mercury concentrations. I began working for the Canadian Wildlife Federation as a Bat Research Technician helping with the Canadian Bat Box Project. I am excited to be continuing to research bats after finishing up my degree!



Gardening for Bats by Bailey Bedard

In Canada, all bat species are insectivorous which means they eat only insects. You can use your garden to attract bats by planting a “bat friendly” garden that will give bats a good spot to feast on insects. This does not mean attracting biting insects like mosquitos, although bats do help reduce mosquito populations, but rather attracting other night-active insects that bats like to feed on like some beetles, flies, mayflies, caddisflies, lace wings, and moths using plants in your garden. Planting a variety of



Copyright © Walter Muma
Yellow Violet – *Viola pubescens*



native plant species will attract native insect species by providing food and shelter. Specifically, night-blooming and night-scented plants with pale-coloured flowers that are easily seen in the dark attract moths that bats can feed on (photos of native plants that can be used to attract insects for bats below). You can search through the [Canadian Wildlife Federation's native plant encyclopedia](#) to find species suitable for your region.

The use of pesticides and herbicides are harmful to insects and the plants they use for food. Organic gardening is a good practice when trying to attract insects like moths and the bats that eat them. Another great way to attract insects that bats like to feed on is to let your garden go a little wild. A lot of native plants that we might consider weeds are fed on by moths or their caterpillars (i.e. Goldenrod). These insects also need fallen leaves and other plant debris for sheltering away from predators and as a suitable shelter to overwinter. Rather than clearing out leaves, stems, and dead plants in the fall, wait until the spring so it can be used by these insects over the winter, ensuring a healthy population of insects in the spring for bats to feed on when returning from their winter hibernation sites.

[Insect hotels](#) are another method of attracting beneficial insects to your garden and in turn attracting bats. Insect hotels offer alternative habitat that mimics insects' natural habitat benefiting their populations in areas that may be lacking natural habitats (i.e. landscaped gardens). Increasing the numbers of beneficial insects help to control pests, reduce the need for pesticides, and balance the gardens ecosystem.



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Goldenrod – *Solidago* spp.



Copyright © Walter Muma
Trailing Arbutus – *Epigaea repens*



Copyright © Walter Muma
Bush Honeysuckle - *Diervilla lonicera*



Copyright © Walter Muma
Bunchberry - *Cornus canadensis*



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Canada Anemone – *Anemone canadensis*



Fireweed – *Chamerion angustifolium*



Other ways to make your garden bat friendly is adding a pond with clean open water as a drinking source for the bats and reducing light in your yard at night which deters bats. Bats also

act as great allies through their guano, which can be used as a good fertilizer for plants once it is composted. Bat guano is loaded with nutrients like nitrogen, phosphorous, and potassium, all of which help promote strong, green healthy plants. To use as a fertilizer, you can sprinkle bat guano pellets or powder forms of bat guano around the base of your plants and water it into the soil thoroughly.



Blue Flag Iris - *Iris versicolor*



Wild Strawberry - *Fragaria virginiana*



Asters - *Symphotrichum* spp.



Turtlehead - *Chelone glabra*

Concrete Bat Boxes by Lucas Haddaway

When we think of bat boxes, what typically comes to mind is a design made from plywood or similar timber materials. Wood is most frequently used throughout North America, Australia, and Asia. However, wooden designs are not as ubiquitous in Europe where bat boxes are often made of woodcement also known as woodcrete, a material produced using a mixture of sawdust and cement.

The use of cement in woodcement boxes offers a greater durability and resistance to natural factors such as rain, wind, snow, rot, and damage from wildlife. Woodcement bat boxes can greatly outlast





wood boxes, with an estimated life expectancy of 25-30 years compared to about 5-10 years for timber boxes. However, the benefits of the material properties of woodcement come at a tradeoff from a North American perspective. For those interested in do-it-yourself projects, there is greater accessibility to timber products such as plywood, which many people may have just laying around in their house or garage. For North Americans interested in purchasing a woodcement box, they will likely be limited to ordering from Europe, which imposes potential time and financial constraints with shipping and related costs.



[Schwegler](#)

Another important aspect is how bats use boxes made from these two materials. Woodcement is a denser construction material than wood. This means that woodcement boxes have a greater capacity to buffer high temperatures and can potentially protect bats from overheating events. However, these insulative properties come with tradeoffs, as reducing maximum temperatures under certain conditions may create colder microclimates within the roost that are less suitable for pup growth.



[British Columbia](#)

Although wood is the primary bat box material used throughout Canada, there is at least one documented success story involving alternative materials. The Fish & Wildlife Compensation Program in British Columbia installed nine experimental single-chambered artificial rock bat roosts made from a mixture of concrete and fibre. Fecal samples were obtained from five of them, indicating the design was successful in attracting bats to more than half of the roosts.

Perhaps the most important factor when discussing these building materials is what types of boxes do bats prefer? Based on available research for different



materials, bats will make use of both woodcment and timber boxes. Some species seem to prefer one type over the other and select different types of boxes at different times of year. Roost requirements change across seasons, and thus any one type of box is unlikely to meet all roost requirements all the time.



Bats in Umbrellas by Karen Vanderwolf

Participants have noted bats roosting in patio umbrellas in Alberta, British Columbia, Ontario, Nova Scotia, and Quebec. In some cases, bats seem to prefer roosting in the umbrellas instead of nearby bat boxes. Usually only one or two bats roost in an umbrella at one time. They are most commonly seen in July and August. You may find them when [you are camping](#), and inadvertently bring them home! We are interested in hearing more about these sightings including the dates you note bats roosting in your umbrella and how many bats there are. Please email Karen [kjvanderw\[at\]gmail\[dot\]com](mailto:kjvanderw[at]gmail[dot]com) if you see a bat in your umbrella!



Bat Boxes Across Canada



Rich Waiz, British Columbia



Guano tray, Jasper National Park, Alberta



Glenn, Quebec



Canadian Bat Box Project Newsletter, April 2022



Jim Leslie, Alberta



Kluane Cabins, Yukon



Nadine Brossart, Saskatchewan



Canadian Bat Box Project Newsletter, April 2022



Ontario



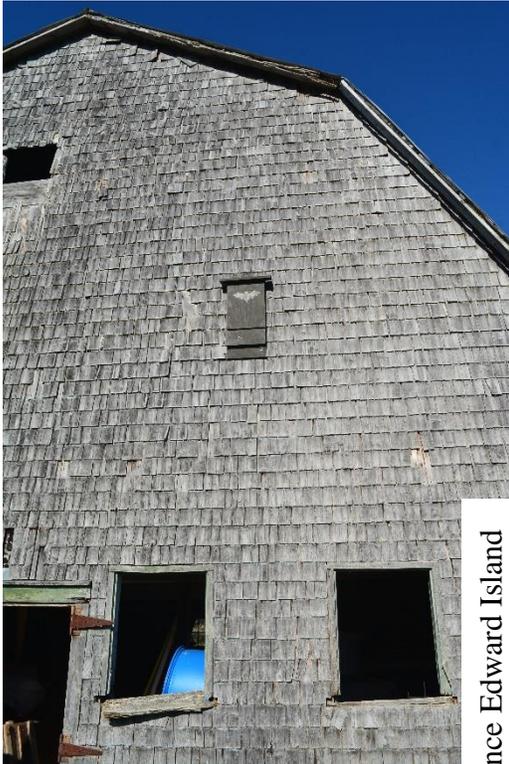
Ontario



Catherine Baier, Ontario



Canadian Bat Box Project Newsletter, April 2022



Cam Renaud, British Columbia



Canadian Wildlife Health Cooperative, Atlantic, Prince Edward Island



Nova Scotia