



Canadian Bat Box Project Newsletter, October 2022

Welcome to the fourth newsletter for the Canadian Bat Box Project! The second of three field seasons (2021 – 2023) for the project has wrapped up. Microclimate loggers have started streaming in and we are about to be buried in data!



CANADIAN WILDLIFE
FEDERATION
FÉDÉRATION
CANADIENNE DE LA FAUNE

All the guano samples you sent in will be submitted to the lab November 2022 so the bat species can be identified. We expect the results back by August and will contact you individually to let you know which bat species you have. We will submit the swabs of bat boxes you sent us to the lab for analysis this fall and will contact participants individually to let you know if we detected the fungus that can cause white-nose syndrome. Thank you to everyone for all their hard work this past summer collecting samples, counting bats, and installing microclimate loggers!

In this Issue:

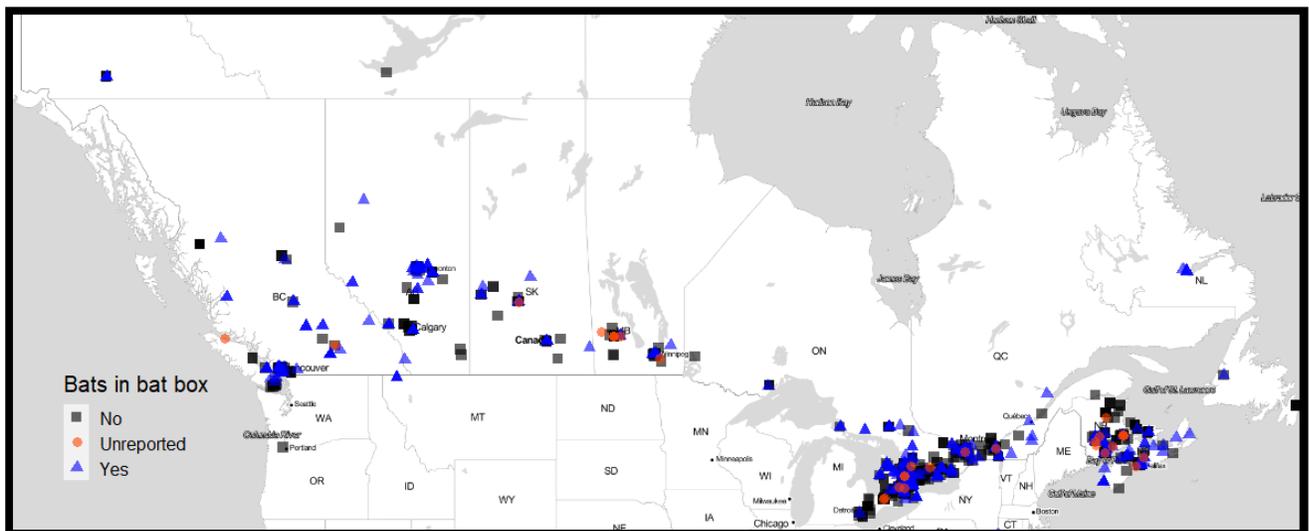
- Bat Haven.....2-4
- Summer Fieldwork - Ontario.....4-8
- Bat Box Research in Canada.....9-10
- Bat boxes across Canada.....11-14

To date we have received almost 1,400 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



By Karen Vanderwolf



Canadian Bat Box Project Newsletter, October 2022

Thanks to our supporters and partners:



Environment and Climate Change Canada
Environnement et Changement climatique Canada

LIBERERO
FELLOWSHIP PROGRAM



Ontario

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



Parks Canada
Parcs Canada



CANADIAN WILDLIFE HEALTH COOPERATIVE



Thanks to Jordi Segers for editing the newsletter.

Bat Haven by Blythe Beynon, Parks Canada

For the past two years, Blythe has worked in Canada's Protected Areas Establishment and Conservation directorate, having the good fortune to research North American bats. Of course, becoming an avid bat fan in the process!

Bats have been found in almost all of Canada's national parks below the Arctic, as well as in many national historic sites. Through conservation and recovery efforts, Parks Canada is working to keep it that way.

In Canada, bats face many threats ranging from habitat loss to disease. One fungal disease, white-nose syndrome, has decimated many bat populations since its arrival to North America in 2006. As a direct result, three bat species suffering particularly severe population declines required emergency listing under the *Species at Risk Act* in 2014. This listing led to the publication of a federal recovery strategy which





Canadian Bat Box Project Newsletter, October 2022

recommends actions aimed to arrest or reverse the decline of bat populations. Guided by this strategy, Parks Canada has increased its work to support all bats.

Some key bat conservation and recovery initiatives at Parks Canada include:

- outreach events and materials to dispel myths and foster public support for bats;
- bat research in collaboration with government and non-government organizations, and academia; and
- bat monitoring to gain insight into bat populations and their health, as well as to identify key habitat for protection.

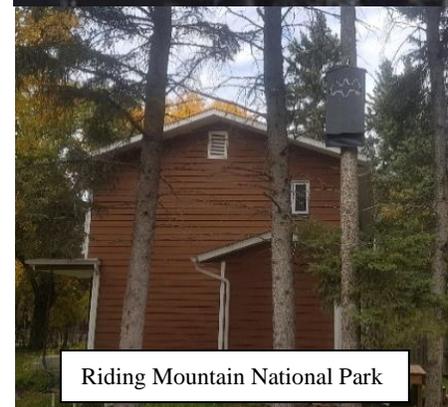


The primary goal is always to maintain existing bat habitat. Unfortunately, this is not always possible. Roosts are especially important habitat; bats use different types of roosts. Some roosts provide shelter while bats rest and digest and special roosts called “maternity roosts” are used by female bats to give birth and to raise their babies, or “pups”. Loss of roosts can result in reduced reproductive success and can also cause bats to abandon the surrounding area altogether. Worse still, in order for bats to survive white-nose syndrome they require ample fat reserves and increasing and maintaining weight depends heavily on access to quality roosting sites. To mitigate roost loss, many organizations recommend the installation of bat boxes. Some experts believe that well-designed bat boxes will also support the recovery of bat populations that have suffered white-nose syndrome by increasing birth rates. However, there is a knowledge gap concerning the effectiveness of bat boxes in Canada since most existing research on bat boxes comes from warmer climates. The Canadian Bat Box Project will help address this knowledge gap.

At Parks Canada we’re particularly excited to be part of the Canadian Bat Box Project. Parks Canada’s enthusiasm for this project is best described by Fiona Moreland, an ecologist working at Prince Albert National Park. Fiona identifies a desire to help bats that is shared throughout Parks Canada. “Bats in Canada need all the help we can give them, so when we were approached to participate in the bat box project, it was easy to say Yes! in the hope that the information we’d provide would help determine the types of bat boxes being used successfully and shed some light on why ours were not very popular.”



Prince Albert National Park



Riding Mountain National Park



Canadian Bat Box Project Newsletter, October 2022

Parks Canada is well suited to assist the Canadian Bat Box Project in addressing this knowledge gap. Managing more than 450,000 of diverse lands across Canada, our sites act as ‘living labs’ to develop and test approaches for species conservation and recovery. The Canadian Bat Box Project is a perfect example of these labs being put into action in support of species conservation. Parks Canada’s access to regions all across Canada broadens the scope of the project by providing data for underrepresented regions. In this way, we hope to determine whether the optimal design for a bat box varies regionally.

Parks Canada has already had some exciting results. For example, David Bruinsma, Resource Management Officer at Elk Island National Park, installed bat boxes in 2020 to provide alternative roosting sites for a maternity colony using the roof of the park’s garage and other nearby operational buildings. Although, initially these boxes did not appear to attract bats, by mid-summer 2021 they took off. As David explains “joining the Canadian Bat Box project



motivated us to monitor our bat boxes more closely, including conducting exit counts, counting guano pellets, and installing temperature and humidity data loggers. The overall number of bats in the colony has remained stable at around 150, but it’s been really neat to see how much they shift between roosts – on any given day, the majority of the bats may be roosting in the original garage roof site or in any one of the three bat boxes”. This type of observation is the kind that is typically shared at Parks Canada’s Bat Community of Practice meetings, the aim being to continue to improve our approach to bat recovery and conservation.

Fiona Moreland sums it up: “We are excited to see the preliminary results coming in, and hope to make the necessary changes to the bat boxes we use in Prince Albert National Park, with the ultimate goal of helping these important members of the natural world survive.”

Summer Fieldwork - Ontario by Bailey Bedard

This past summer has been busy for everyone, and bat researchers are no exception! After organizing the mailing and installation of over 300 temperature and humidity data loggers for bat box participants across Canada, our focus for the summer turned to monitoring bat boxes in Ottawa and surrounding areas. Our crew of bat research technicians shone a flashlight up into bat boxes to check for bats once a month. When we saw bats, we did our best to count the number of individuals roosting in the box. We also checked below the box for fresh bat guano, evidence the bat box had been used this summer. As you can see in the photos, there is a great variety of bat box designs installed by participants so we also recorded physical characteristics (e.g., height, aspect, colour, number of chambers etc.) that will help us analyze what types of boxes bats are most likely to use.



Canadian Bat Box Project Newsletter, October 2022

In addition to five bat boxes known to be occupied by bats for years, we found seven new boxes that had one or more bats roosting in it through the summer! These boxes have all been installed for 4-5 years and are finally being used by bats. Four other bat boxes were empty at the time of monitoring but had fresh guano below or on the walls of the interior chambers, indicating it had been used at some point over the summer. We collected swab samples to test for the presence of the fungus that causes White-Nose Syndrome in five of the occupied boxes. In boxes with lots of guano where we were unsure of the species, we took guano samples for bat species identification.



Parry Sound, Ontario



Wesley Clover Parks Campground, Ottawa, Ontario



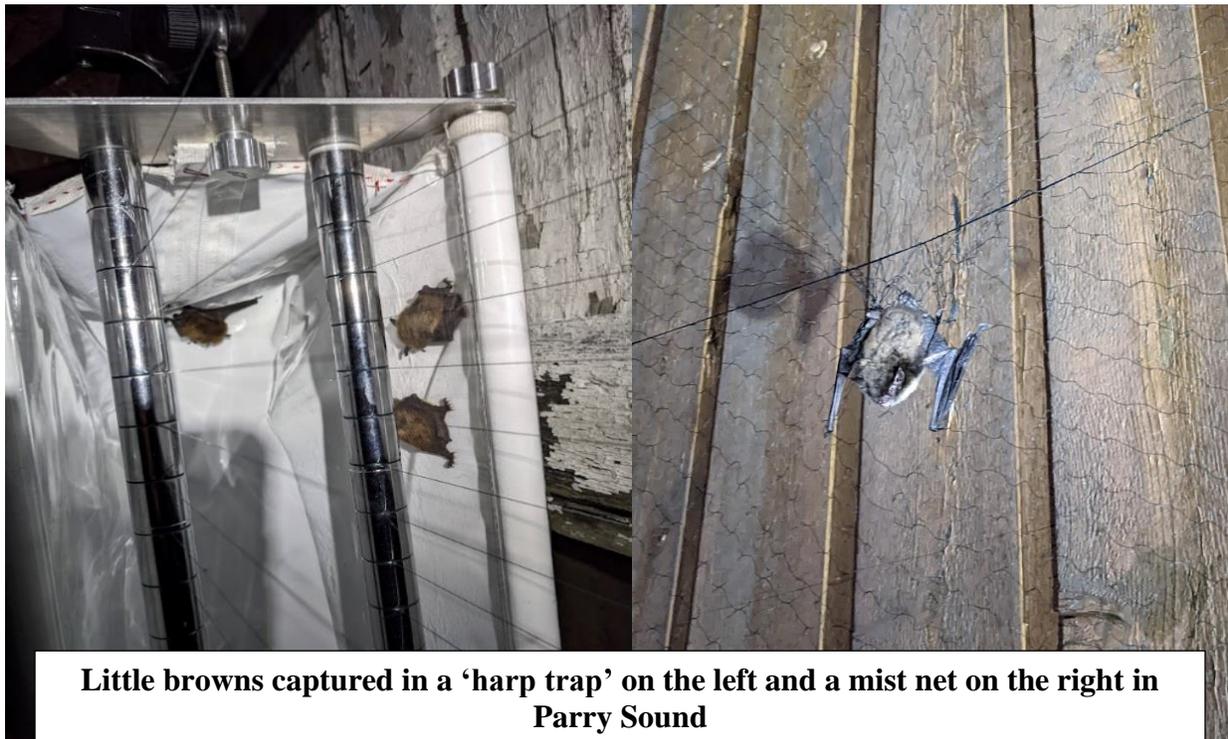
Little brown myotis roosting in a chamber of a two-chambered bat box



We also conducted two bat tracking studies this summer whose objective was to identify new little brown roosting sites and determine what roost characteristics the bats prefer. To do this, our team captured endangered little brown myotis and used radio transmitters to track individuals to their roosts. We glued radio transmitters to bats' backs with skin adhesive and then released the bats. The tags fall off naturally after two to three weeks.

Our first tracking study took place from late May – early June at a cottage in Parry Sound, Ontario. Colleagues went to this same site last year for a similar tracking study. We tracked 12 little browns and were able to locate nine almost on a day-to-day basis. The bats roosted in buildings or bat boxes around Parry Sound within five kilometers of the cottage. Individual bats used the same roosts day-to-day, but sometimes they would alternate between two or three roosts. After about a week and a half all the tags had likely fallen off, so we stopped tracking.

Our second tracking study took place at the MacSkimming Outdoor Education Centre in

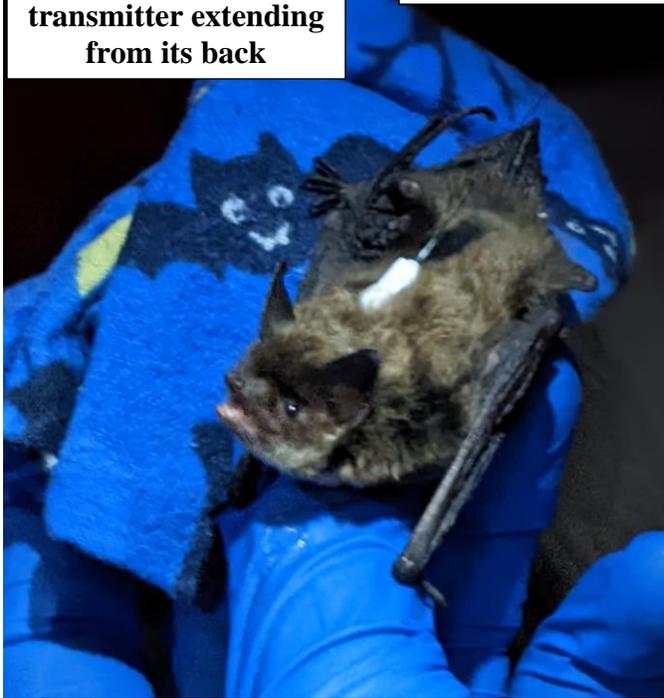




Cumberland, Ontario. Little brown myotis and big brown bats roost in multiple buildings at this site, much to the delight of the landowners who are advocates for bat conservation. While they do not plan on evicting bats from the buildings, they have also installed nine bat boxes throughout the site to provide alternative roosts.

We visited this site in early July to do an emergence count of bats exiting one of the main buildings. We noticed large quantities of bat guano along the side of the building and counted over 150 little brown myotis bats in one hour! This result confirmed the site was viable for capturing and tracking bats to alternative roosts, so we returned in early August and set up nets. We brought along a sizeable crew consisting of bat experts, volunteers, a news crew, and a youth education group from the Canadian Wildlife Federation's [WildOutside program](#) to learn about the biology of bats and conservation research.

Notice the thin radio transmitter extending from its back



Little brown bats at MacSkimming



Notice the silver band on its wrist in case of recapture

As the sun set, we anticipated a hectic night of catching, weighing, and banding the large colony of bats that were about to start emerging from the building. However, perhaps due in part to the noise and commotion of the crowd, the time of year when some bats start heading to swarming sites to mate, and just being outsmarted by the bats, hardly any bats exited from the original spot. In fact, we only caught five bats! To our surprise, one of these five bats was a silver-haired bat, a species that is



Silver-haired bat at MacSkimming



uncommonly encountered and studied in the area because they roost high up in tree cavities and lifted bark.

After tracking our four little brown myotis and one silver-haired bat over the next two weeks, we found the little browns alternated between buildings on the MacSkimming site, houses/sheds that neighbour this site, and even bat boxes on neighbouring properties. We found the silver-haired bat roosting in different trees in the forest surrounding the MacSkimming capture site, often in snags with plenty of roost cavities. After about two weeks of tracking, we lost track of all but the silver-haired bat. This is likely because their tags were beginning to fall off and because by late August, the bats were likely heading to swarming sites to mate before spending the winter hibernating in caves. At this point we wrapped up our second tracking study of the year.

Catching a rarely-caught species among our unexpectedly small number of captured bats was a great ending to a busy field season and a perfect summation of how field work typically goes: not how you expected!

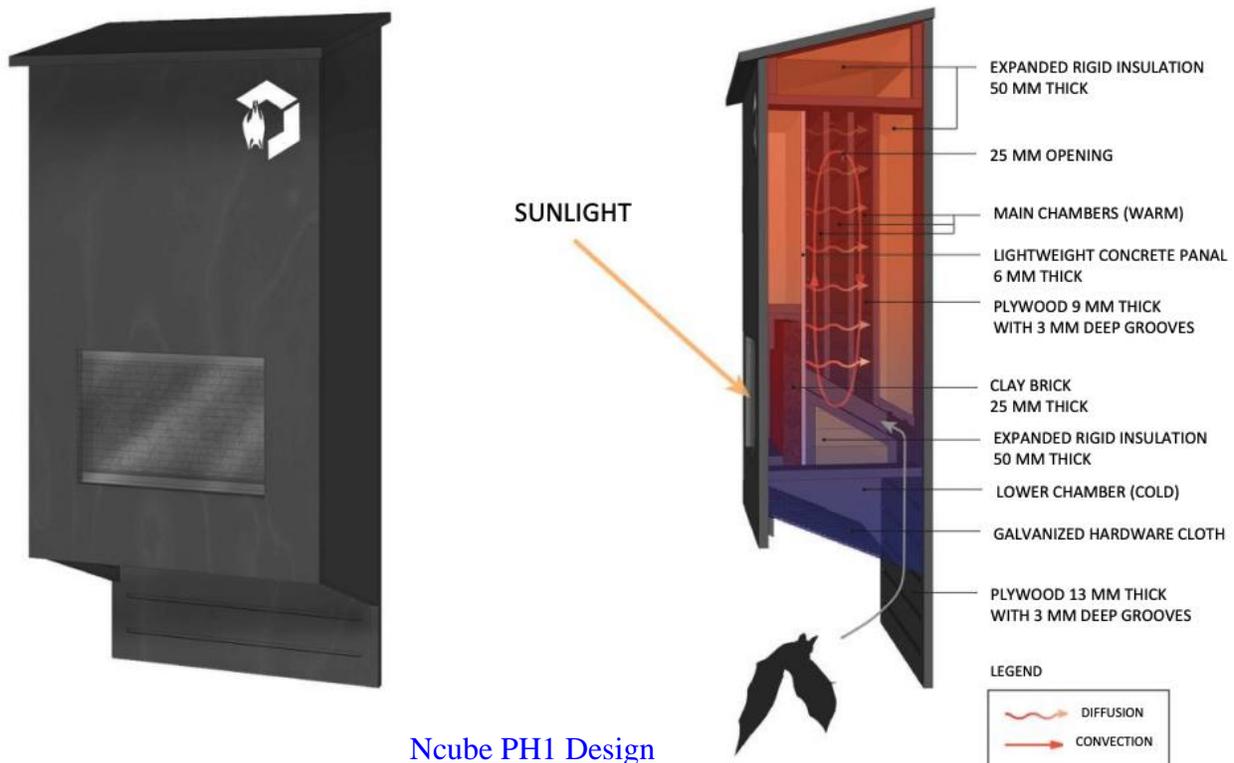




Bat Box Research in Canada by Lucas Haddaway

Bat box research is a relatively new field that is growing in importance as threats such as white nose syndrome and habitat loss continue to endanger Canadian bats. Most bat box research projects fall into two broad categories: those focused on understanding factors that make up suitable bat boxes, and those focused on monitoring existing bat boxes.

Studies on what makes a suitable bat box typically focus on factors affecting temperature within bat boxes, and how these factors can be optimized for bats. Colour, design, materials, orientation, and mounting can all affect the internal temperatures of bat boxes. Past research found that multi-chambered and/or larger bat box designs are more suitable than smaller/single-chambered boxes. [A study in Quebec](#) found that upper and lower chambers are preferred over side-by-side chambers such as in the Ncube PH1 design below. Multiple chambers provide better insulation and create temperature gradients. This gives bats more flexibility in choosing the best roost spot when external temperatures vary. Insulated bat boxes are also less likely to overheat. Some studies have experimented with heating bat boxes, such as [this one in Manitoba](#), and using materials other than wood to build boxes, such as [concrete in British Columbia](#). Orientation and placement are also important considerations when installing bat boxes. For the best temperature stability, the Quebec study determined that bat boxes should be placed on buildings, oriented facing east, and shaded during warm afternoon hours.





Canadian Bat Box Project Newsletter, October 2022

Ongoing monitoring is important to understand how bat boxes can impact bat conservation and which designs, mounting styles, etc., bats prefer in urban and natural settings. Monitoring research indicates that bats are increasingly using bat boxes in parts of Canada. Staff at the [Beaverhill Bird Observatory](#) (BBO) in Alberta have [monitored bat boxes](#) on the property since 2017. Throughout this period, they found that more and more bats used bat boxes each year, and they even found a maternity colony in one of the boxes for the first time in 2020. In 2017, BBO counted 106 bats between May and September. As they added new boxes and replaced older and single-chamber designs with larger, multi-chamber boxes, bats increasingly took advantage of these roosting sites. In 2021, BBO counted 1,475 bats between May and September! Bats around BBO prefer larger, multi-chambered boxes, a finding that aligns with other monitoring projects such as the [Campbell River Bat Project](#) in British Columbia.

Overall, the body of bat box research is growing in Canada. A major threat to bats in Canada is habitat loss, so providing alternative roosting options for bats in increasingly urbanized areas is crucial for the future of bat conservation. A key pattern in past research is that if you build it (bat boxes), bats will come! It is important to use the recommendations noted above when choosing designs and locations for bat boxes, for example by placing bat boxes on buildings (where safe cohabitation with humans is possible), in shaded conditions, and incorporating design elements such as insulation materials and multi-chamber designs to provide optimal roosting temperatures. It is our hope that the Canadian Bat Box Project will add valuable knowledge to the existing body of research and will contribute positively to the conservation of bat species in Canada.



[Checking a bat box](#) at Beaverhill
Bird Observatory, Alberta



Canadian Bat Box Project Newsletter, October 2022

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



Yukon



J. Thomson, Alberta



New Brunswick



British Columbia



Canadian Bat Box Project Newsletter, October 2022



Lori Phinney, Nova Scotia



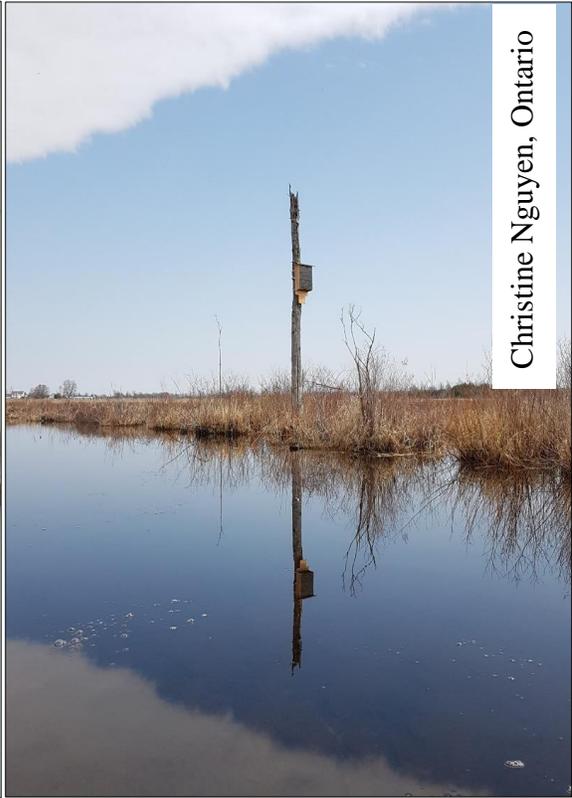
Manitoba



Canadian Bat Box Project Newsletter, October 2022



Ontario



Christine Nguyen, Ontario



Jasper National Park, Alberta



Canadian Bat Box Project Newsletter, October 2022

