



Canadian Bat Box Project Newsletter, August 2025

Welcome to the eighth and final newsletter for the Canadian Bat Box Project! It is sad to see this project come to an end, and I sincerely thank everyone for their participation and enthusiasm. I have learned a lot from your experiences with bats across Canada! We want to continue our research with bat boxes across Canada in a different form from the Canadian Bat Box Project. If you are interested in continuing to participate in bat box research, you can [register your bat box](#) with the Canadian Wildlife Federation and [report your bat sightings](#) in your box(es). You can report sightings of bats outside of bat boxes on [iNaturalist](#).

If you have seen bats roosting in a patio umbrella this summer, please let me know! Pictures are always welcome. We are also interested in hearing about bat colonies in buildings.



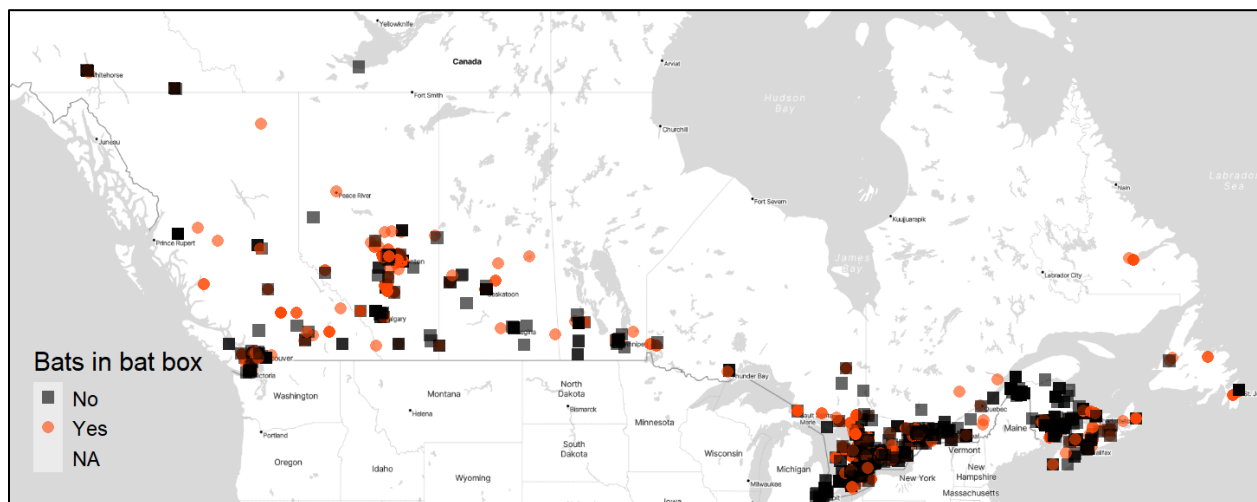
CANADIAN WILDLIFE
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We developed guidelines on bat box design and placement based on the results of this study. They are available at [Canadian Wildlife Federation: Bat House in Your Backyard](#), along with an updated DIY bat box design that reflects the study results, and a list of places you can buy bat boxes that meet the minimum dimensions.

We received 1,574 survey responses for this study from across Canada, including all provinces and every territory except for Nunavut. Very impressive – thank you to all who submitted! The map below shows where the bat boxes are located, and whether they have bats.

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Thanks to James Pagé for editing the newsletter.

Preliminary results & future research by Karen Vanderwolf

We are busy sorting through the large volume of data generated by this project, analyzing it, and writing it up for a scientific publication. I will send out the publication once it is available. We have data on the designs and placement of 1637 bat boxes from 887 participants across Canada. We have microclimate data (temperature and relative humidity) from 386 bat boxes over multiple years. A lot of data!

Results from guano analysis and our surveys visiting bat boxes indicate little brown bats (*Myotis lucifugus*) is the most common bat species using bat boxes in Canada, followed by big brown bats (*Eptesicus fuscus*). Except in British Columbia, no other bat species were detected using bat boxes in Canada.





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Province	Little Brown bat	Big Brown bat	Little & Big Brown bats	Yuma bat
British Columbia	17	1	-	3
Alberta	90	4	17	-
Saskatchewan	3	11	5	-
Manitoba	10	-	-	-
Ontario	85	55	8	-
Quebec	5	1	-	-
New Brunswick	6	6	-	-
Nova Scotia	14	-	-	-
Prince Edward Island	13	-	-	-
Newfoundland	14	-	-	-
Yukon	15	-	-	-
Northwest Territories	-	-	-	-

Most bat boxes with bats in Canada have a maximum of <10 bats. Few boxes house large bat colonies. Generally, little brown bats tend to form larger colonies in bat boxes than big brown bats.

Number of Bats	Little Brown bat	Big Brown bat	Little & Big Brown bats	Yuma bat
1 – 9	118	58	12	1
10 - 50	61	14	13	1
51 – 100	46	5	5	1
101 – 200	21	-	-	-
>200	6	-	-	-
unknown number	18	1	-	-

We are now looking for bat building roosts for future research. Bat boxes are often installed when bats are excluded from buildings, and we want to compare the microclimates available in building roosts to our large database of microclimate data from bat boxes. We are also interested in getting more details on homeowners experiences with excluding bats from buildings. You can contact me at [kjvanderw\[at\]gmail.com](mailto:kjvanderw[at]gmail.com) if you are interested in participating in further research. I will contact participants that mentioned they have bats in their building and those that performed bat exclusions once these new projects get underway.



Little brown bats in a barn in Ontario. Little brown and big brown bats will form maternity colonies in buildings to raise their pups. Big brown bats sometimes spend the winter in buildings as well, instead of hibernating in underground structures such as caves and mines. There are also reports of tricolored and small-footed bats using buildings in Ontario. Bats will use all sorts of building types, including sheds, churches, barns, and schools. Photo: Karen Vanderwolf.

Blind as a bat? What do bats really see by Emily Becker

Emily Becker started as a volunteer with the Bat team at the Canadian Wildlife Federation checking bat boxes around the Ottawa area in late 2022 & was lucky enough to be brought on as a Bat Research Technician in the summer/fall of 2023. During that time, she participated in bat captures & tracking studies & is looking forward to learning more about bats & participating in future research.



Blind as a bat is a common phrase used in everyday language. It is often used to refer to someone who has poor vision, and poor vision has become synonymous with bats. However, the original saying wasn't based on a bat's physical ability to see but on their erratic flying pattern, which makes them look like they are stumbling around in the dark. It is well known that bats have keen hearing abilities and use echolocation to find food in the dark, and some believe their advanced hearing stunted the development of their vision, but are bats blind?

The colours an individual can see is determined by the number and type of [photoreceptors](#) their eyes possess. Photoreceptors are cells that convert light energy into electrical signals the brain uses to determine what it is seeing. Some species can see more wavelengths of colour than others. In vertebrates, there are two types of photoreceptors:

- Rods have the light sensitive pigment rhodopsin and are used for contrast, for example black and white. These help us see objects in dark conditions.



- Cones come in three types, each sensitive to different wavelengths of light (blue, green, and red). This allows the brain to differentiate colors and perceive fine details. They contain two types of proteins called [opsins](#): shortwave (SWS) that detect blues and purples, and longwave (LWS) that detect reds and yellows.

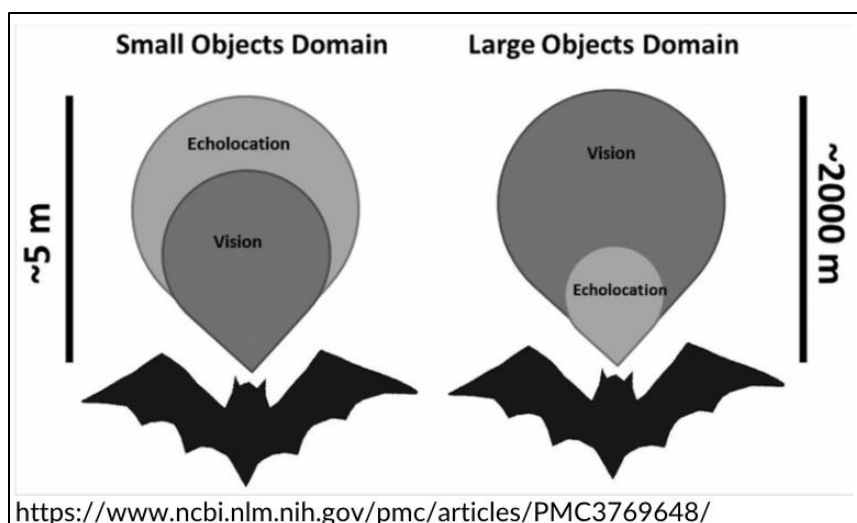
Bats can see. In fact, they have between [two to five times](#) as many rod cells per mm² as humans. Thus, in some ways, they have better vision than us. Since bats are nocturnal, it follows they would have more rod cells than humans so they can see in the dark. However, they also have cone cells and can perceive colour, particularly in the [orange and red](#) wavelengths, though, some bat species can see blue. Seven insectivorous bat species can see and respond to light on the ultraviolet spectrum, which humans cannot. This is [advantageous](#) for bats for many reasons, but specifically it can help them find food, roosts, and avoid predators in the dim light at dusk and dawn. There are also bats like the nectar-feeding Pallas's long-tongued bat ([pictured right](#)) that can see well in the daylight.



Although bats mostly use echolocation while hunting, they will often use vision as well, especially to detect [larger objects](#) and locate roosts. In fact, in certain situations, bats will rely more on visual cues than acoustic ones. Their eyesight is well-adapted to darker conditions due to the number of rods and the longwave opsins their eyes possess. Echolocation enables bats to see very small insects in dim conditions they would not be able to pinpoint with their eyes. It also allows for [continuous tracking](#) because they can still echolocate even if their prey is not in sight. Having large eyes like an owl, another nocturnal predator, would not be a successful

strategy for bats because their prey is so much smaller. By using both vision and echolocation, they can discern all sizes of objects at night.

There is still much to learn about the visual acuity of bats. Since there are over 1490 species, it makes sense there is great diversity in anatomy and ability, and large generalizations may





not reflect each species' reality. But overall, bats are not blind and in fact have better vision than humans in some ways. Might be time to edit that old saying; blind as a mole has a nice ring to it.

What's on the menu? by Beatriz Nogueira e Figueira

Beatriz is a master's student at the University of Waterloo researching migration ecology and physiology in bats at Long Point, Ontario. Her research specifically focuses on the types of roosts bats use during migration and types of fat they carry.



Bats, although being incredibly diverse animals found all around the world, are commonly misrepresented as either mosquito-eating-machines or dangerous blood suckers. Bats are found in all kinds of habitats across the world, so the types of food they eat and how they hunt is just as diverse! In the tropics, there are bats that specialize in drinking nectar, eating fruit, or eating small animals. We have nectar-feeding bats to thank for tequila, as they are the primary pollinators for agave plants that tequila is made from. Fruit-eating bats support many crops we rely on, such as mangoes, papayas, and figs, by spreading their seeds. Fish-eating bats hunt fish by raking their large feet through the water like ospreys. There are also bats that feed on the blood of other animals, known as vampire bats. Although often thought of when talking about bats, out of over 1490 bat species there are only three species of vampire bats. They live in Central and South America, and primarily feed on the blood of mammals and birds. They have specially adapted noses with heat-sensing molecules on the ends of the nerves that can detect hotspots with easy access to blood.



A Common Vampire Bat feasting on blood; looks like the goat hasn't noticed it has an unwanted guest! Photo: Nicolas Reusens

Insects are by far the most popular food source for bats, with 70% of the world's bat species, including all bats native to Canada, being insectivorous. These bats use a variety of different strategies to catch insects, often paired with the use of echolocation. Catch prey in mid-air using echolocation is called the [aerial hawking strategy](#).

Bats can use their wing or tail to scoop insects into their mouth. Big Brown Bats, Silver-haired Bats, and Hoary Bats are bat species found in most provinces across Canada that use this strategy to catch their food. Gleaning is another strategy, specifically for hunting prey on surfaces, like a beetle on a leaf. The best places to hunt for insects using gleaning are environments with lots of leaves or branches, so some bats use echolocation that is specific for this environment, while others use a combination of vision, smell, and hearing to locate prey. The Long-eared Myotis,



found across western Canada, and the Pallid Bat, found in British Columbia, both use gleaning. Bats will also use multiple hunting strategies to catch prey, such as the Northern Myotis that uses both aerial hawking and gleaning to hunt insects across Canada.

Worldwide, 70% bat species eat insects, 18% eat fruit (dispersing seeds in the process), 6% drink nectar (while pollinating flowers), and 3.5% are carnivores (eating other mammals, birds, frogs, etc.). [Figure from @USFWS WNS.](#)

Bat diets vary greatly depending on the time of year, location, and species. The size of the bat can also greatly affect the type of insects they can hunt. The Hoary Bat, for example, is the largest bat in Canada and migrates south for the winter. Its large wings make it difficult to forage in cluttered forests, so it hunts in open spaces.

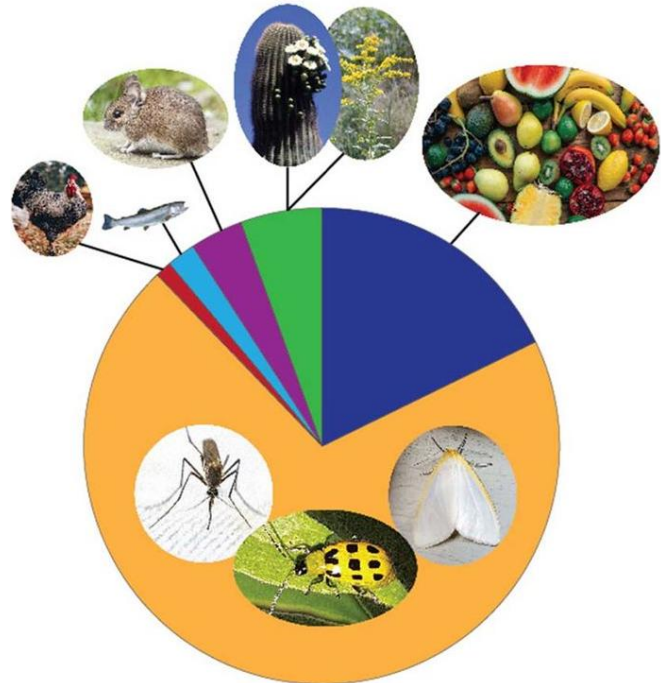
However, it has a large, strong jaw, and its diet is composed mostly of big, hard insects, such as crickets and beetles, along with moths. The Silver-haired Bat also migrates but is much smaller than the Hoary Bat. Its diet is mainly composed of moths but also includes more plant-eating insects found within forests as its smaller size allows it to forage in more cluttered areas. These bats forage for insects every night even during migration, as opposed to storing fat for the journey as some bird species do.

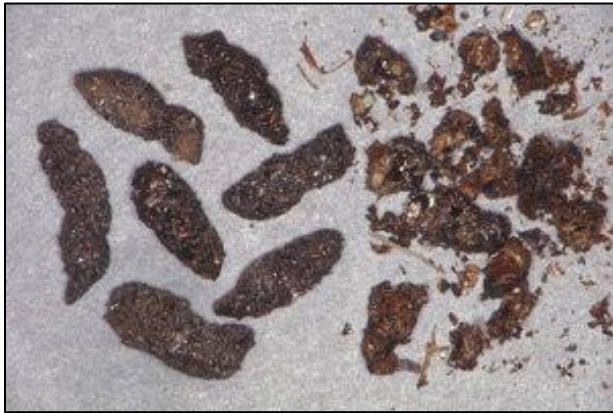


*A Hoary Bat devouring a recently caught moth.
Photo: Merlin Tuttle*

The diet of Big Brown Bats is composed mainly of beetles, but they often eat flies, moths, and mayflies as well. When at wildlife rehabilitation centres, these bats are hand fed mealworms and can eat up to 40 a day! When hunting for insects in the wild, they consume many beetle species with shiny shells made of chitin. Bats can't digest chitin, which leads to very unique "glitter poop"! Before DNA analysis tools, the shiny exoskeletons in guano were used to distinguish Big Brown Bat guano from the droppings of bats

What Do Bats Eat?





that don't typically eat beetles (such as Little Brown Bats), as well as estimate the quantity and types of insects these bats were eating.

Bat droppings sparkling with insect exoskeletons. Photo: Jim Kalisch

Moths are the food of choice for many bats, including the Northern Myotis and the Long-eared Myotis, but some diets can vary greatly such as that of the Pallid Bat. In British

Columbia, they mostly feed on large invertebrates such as beetles, crickets, and moths, but outside of Canada their diet includes the most venomous scorpion in North America, the Arizona Bark Scorpion! It also hunts small lizards and rodents and consumes cactus nectar and fruit. Talk about versatility!

A Pallid Bat with a recently hunted long-horned grasshopper, how impressive! Photo: Merlin Tuttle



Although the idea of bats clearing the country of mosquitos has proven to be too good to be true, bats don't avoid eating mosquitoes by any means. Those little bodies just aren't worth the effort of hunting! Little Brown Bats and Big Brown Bats include mosquitos in part of their diet, whether accidental or opportunistic. Regardless, [bats are still incredibly valuable for the agriculture industry by eating other common pests, providing billions of dollars in pest-control services each year](#) (for free!). Some destructive agricultural pests consumed by bats include leafhoppers, click beetles (wireworms), and several corn pests. Little Brown Bats can eat between 4 – 8 grams of insects per night outside of hibernation, and when considering that over 6 million Little Brown Bats have died in Canada and the United States due to White-Nose Syndrome, there has been a very considerable decline in insect consumption.



The spotted (left) and striped (right) cucumber beetle, are destructive to Canadian cucurbit plants and are a tasty meal for Big Brown Bats. Photo: Ric Bessin



Although bat diets vary greatly around the world, one thing bats all have in common is being nocturnal, which means all foraging and hunting for food happens exclusively at night. One idea for why bats evolved to be active at night is to avoid competition with birds over food during the day. Most prey for aerial hawking bats are insects that are also nocturnal and can be caught while flying around. This means butterflies, dragonflies, and damselflies are not on the menu for bats, and, although bats don't specifically hunt mosquitoes, these insects sure do! A single dragonfly or damselfly can eat around 40 mosquito larvae per day. Installing a bat box, planting native plants, including a water source, and limiting light in your backyard are all great ways to promote biodiversity and make your backyard bat-friendly, while also attracting the real mosquito-eating-machines!

Batitudes: human perceptions towards bats by Sepidar Golestaneh
Sepidar completed her BSc at the University of Ottawa in Biology, with a focus on animal behaviour, ecology, & evolution. She recently completed an MSc at the University of Waterloo studying population trends & pre-hibernation behaviours of hibernating bats in eastern Canada.



Human perceptions influence mythology, literature, and pop culture, and in a cyclical fashion, these media also influence and shape human perceptions. Documentation of bats' influence on human culture dates back many millennia, as early as 2000 B.C. with bats in the art of ancient Egyptian tombs.

Most mythology involving bats have negative connotations. In many Mesoamerican tales, bats are associated with evil spirits of the underworld, linked with the night, death, and sacrifice. For example, Camazotz (translating to "death bat") is a Mayan God that appears in the Popol Vuh, the foundational pre-hispanic narrative of the K'iche' people of Maya. Camazotz is still a very prominent figure in contemporary Maya religion. Other mentions of bats in Mayan mythology include Zamazotz, a bat spirit at the service of the underworld lords, and Zotzilaha, the name of the House of Bats in the underworld in the Popol Vul. In Greek mythology, bats are associated with punishment, notably with the story of the Minyades, three Arcadian princesses who were punished by Hermes for not engaging in festivities worshipping Dionysus, the god of winemaking and vegetation. Hermes turned these sisters into bats, who were then called oleiai ("the destroyers").

Not all historical perceptions of bats have been associated with such dark motifs. In Polynesian mythology, bats have heroic endeavors with regards to princesses. Leutogi, a Samaon princess, was set by the King to be burned with the forest. Her brother asked the spirits of the dead for help, which they did by sending thousands of bats to save Leutogi by spitting water onto the forest to put out the fire. When the King found out that Leutogi did not die, he banished her to a remote island. Even here, though, Leutogi survived as flying foxes (a group of very large bats!)



came to bring her food and nourish her. With time, Leutogi shifted from Samaon princess to bat goddess.

The daughters of Minyades were three princesses who were cursed and transformed into bats by Hermes. This was their punishment for not properly worshipping Dionysus, the god of winemaking and vegetation. Painting of the Minyades sisters ([‘The Daughters of Minyas’](#)) by Jean Lepautre (1676).



Samoan flying foxes ([Pteropus samoensis](#)) are deemed to be the saviours of ancient Samoan princess Leutogi in Polynesian mythology. These flying foxes are found only in Polynesia, being native to Fiji, Samoa, and American Samoa. Photo: [viweedguy on iNaturalist](#).

Boiled water caltrops, a traditional dish eaten in China’s mid-autumn festivities, resemble bats. They are said to bring good luck and happiness when consumed. Photo from [Hong Kong Cookery](#).

In Chinese culture and mythology, bats are symbols of luck and good fortune, and this association dates back as early as the Han Dynasty (206 BC – 220 CE). Bats have five blessings associated with them: virtue, health, longevity, wealth, and a peaceful death. It’s no wonder many lanterns used at mid-autumn festivities in China are bat-shaped, and water caltrops (“Ling





kok”), which resemble bats, are a traditional mid-autumn dish: being in the presence of this light and cuisine attracts good luck and happiness.

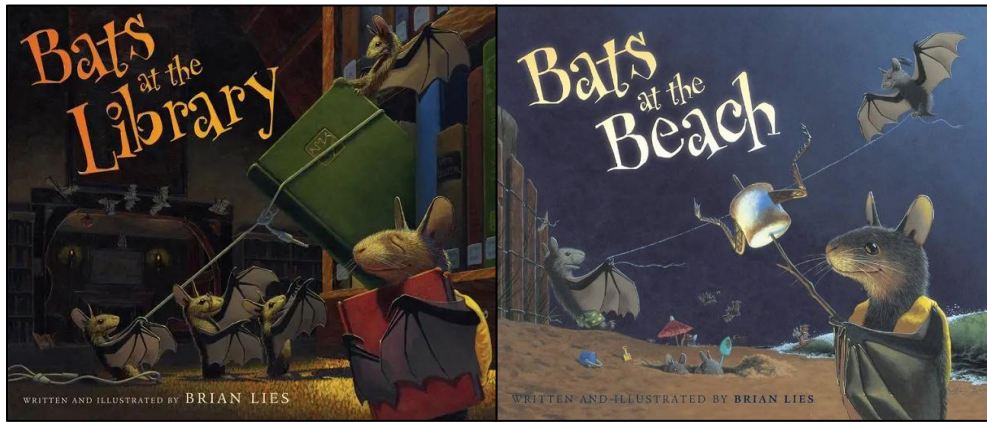
When it comes to contemporary perceptions, perhaps the most popular example is the association of bats with vampires, such as in Bram Stoker’s *Dracula* (1897). The first depiction of a vampire

transforming into a bat is the 1863 volume of *Tales for All Ages* by William H.G. Kingston in the short story *The Vampire, or, Pedro Pacheco and the Bruxa*. “Bruxa” refers to vampires found in Portuguese and Spanish folklore. Prior to Kingston’s work, there is a description of vampiric transformation in Alexandre Dumas’ play *The Return of Lord Ruthven*, (1851) a sequel to John Polidori’s *The Vampyre: A Tale* (1819). Also before *Dracula*, [Punch magazine](#) (1885 issue), a British weekly magazine known to have helped coin the word “cartoon”, depicted the National Irish League as a bat with a human-like face attacking a woman, calling the comic the Irish Vampire.



24 October 1885 issue of Punch magazine. Image shows a comic, named “The Irish Vampire”, with a bat hovering over a lady in distress. The bat has “National League” written on the wings.

Generally, modern literature and film associate bats with scenes of horror (creating a spooky, eerie atmosphere for the reader), vampires, and witches. *House of the Devil* (1896), the first horror film, depicts Satan transforming into a bat. Batman is an exception to negative connotations of bats in pop culture. However, the nature of Bruce Wayne’s (the billionaire protagonist of the *Batman* series) image is cryptic: an isolated mansion (‘the bat cave’) and an intimidating nature that allows him to succeed in fighting Gotham’s villains despite not having actual powers. Batman relies on the darkness of the night to exert his power on the city. Young children’s literature, on the other hand, is much lighter and often features friendly bat protagonists embarking on more inspiring and relatable adventures, such as Jannell Cannon’s *Stellaluna* (1993) and Dan Riskin’s (a bat biologist) *Fiona the Fruit Bat* (2022). Canadian author Brian Lies’ *Bats at the*___ books are consistently on bestselling lists, including *Bats at the Beach* (2006) and *Bats at the Library* (2014).



Brian Lies Bats at the Library (2014) and Bats at the Beach (2006) children's books. Two of many books in his "Bats at the" series.

Many of us may not read ancient texts or watch scary movies, but in today's world, it is increasingly difficult to avoid others' perceptions. Social media, the news, word-of-mouth, etc., rapidly spread an increasing amount of information, influencing public views. Socioeconomic factors play important roles in how people perceive certain animals, including bats. In tropical climates, particularly where fleshy fruit is of high agricultural importance, many people kill bats and destroy roosts as they view bats as pests that damage crops and spread disease. Negative perceptions are often exacerbated after outbreaks like Ebola and COVID-19, both linked to bats. Another example is the association of bats with rabies. However, a [2004 study](#) in Pennsylvania found that humans are more often exposed to rabies through cats than bats or dogs. For most, cats are not the first animal to come to mind when you think of rabies. Disease risk with wildlife can be a tricky topic to navigate because it is important to recognize that risks exist. Biased portrayals in the media complicate conservation efforts and awareness. Exposure to disease vectors is different depending on where you are in the world, but as urban areas continue to expand, there is greater risk of disease spillover. Learning about the risks and understanding how to safely navigate them can improve our perceptions of wildlife.

The good news is human attitudes can change. History, mythology, and pop-culture shape our perceptions, and increased education can lead to more positive views on wildlife. Learning about the key economic and ecological roles bats play has greatly improved the public's opinion on these nocturnal critters. Recognizing the interconnectedness of all creatures fosters appreciation for their roles in our ecosystem. By understanding how to promote safe human-wildlife interactions, we can protect both ourselves and the vital creatures that enrich our world.

Here's another [article on this topic](#), and a [list of fictional books and novels](#) featuring bats.



Canadian Bat Box Project Newsletter, August 2025

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



Mary Woodbury, Nova Scotia



*Tanya, British
Columbia*



Lori Phinney, Nova Scotia



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Ontario



Ontario



*Brandenbark
in Ontario*



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Ontario



Hugh Broders, Newfoundland



Mike Ott, Ontario

