

BAT HOUSE DESIGN AND INSTALLATION GUIDELINES

■ Why care about bats?

Bats are critical to the Canadian ecosystem and economy. They are the primary predators of night-flying insects, including moths, beetles, flies and mosquitoes, providing the agriculture industry with millions of dollars of nature's best insect control. Humans depend on bats as much as they depend on us.

■ Bats face extinction level threats from human causes including:



WHITE-NOSE SYNDROME

(a disease introduced by humans)



DOMESTIC CATS



PESTICIDES



WIND TURBINES



HABITAT LOSS

(loss of mature forests, land conversion and evictions from buildings)

■ Why install a bat house?

Of the 19 bat species we have in Canada, the endangered Little Brown Bat (also known as Little Brown Myotis) is one of the few species known to use bat houses. Despite drastic population declines, primarily due to White-nose Syndrome (WNS), new research shows that this bat species is more frequently found in bat houses than other, more common bats. Endangered bats that survive WNS are critical to population recovery, especially since some individuals show signs of resistance, yet they face additional, human-caused threats, such as loss of roost sites. It is crucial that survivors aren't hampered by these additional threats.

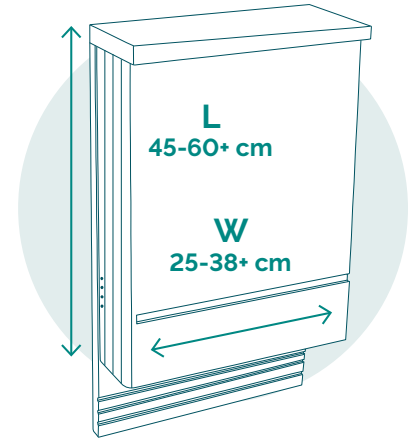
While bat houses can't compensate for widespread habitat loss like deforestation and land conversion, they can help address habitat loss in urban and rural areas, particularly when bats are evicted from buildings or other human structures.

For additional information on bats: HelpTheBats.ca | info@cwf-fcf.org

■ Some bat houses are better than others.

New research by the Canadian Bat Box Project reveals that, not only are some bat houses ineffective, but if built or installed improperly they can lead to lethal temperatures during hot summer months. However, when done properly, bat houses can be a good investment to provide habitat that is more likely to be used by bats.

The following guidelines are based on initial findings of the Canadian Bat Box Project—a nationwide study engaging community scientists and biologists to determine factors that increase the chances of occupancy, specific to Canada:



■ Design and dimensions:

- **A minimum of 45 cm (18 inches) in length (aka height), but 60 cm (24 inches) or more is better.***
 - Length is the most important factor*. A taller house provides a temperature gradient, allowing bats to move up in the box when it is cold and down towards the entrance when too warm.
- **A minimum width of 25 cm (10 inches), although 38 cm (15 inches) or more is better.***
- **Three or more chambers.***
 - The chambers should have a 2.5 cm (1-inch) spacing and holes to pass internally between them, so the bats can switch chambers in response to temperature.
 - The interior of the chambers should be rough or grooved to increase grip.
 - » Metal or plastic screening should be avoided as it can become torn or detached, creating a hazard and space for guano buildup or trapped pups.
 - Depending on the number of bats in the colony, more chambers may be required to accommodate a greater number of bats.
 - More chambers will provide more temperature options, which is good for pregnant or nursing bats to find the appropriate conditions they need each day.
- **Colour of the bat house can affect internal temperature, and sun exposure is an important consideration.**
 - Boxes can be left natural wood colour or painted. Decision on colour should coincide with decisions about placement and numbers of boxes (see next section).
- **Vented on the front and/or sides.**
 - Vents reduce the risk of lethal overheating in the bat house.
- **Made with untreated wood (roughened or grooved for the inside walls) and the exterior treated with non-toxic (low to no VOC) paint/stain/sealant.**
- **Made with a landing pad that has textured grooves to increase grip.**
- **Sealed joints to prevent air/water leaks. This can be done by caulking all seams, sloping the roof and/or shingles.**

**Bat house size and number of chambers relate to flat (rectangular) bat houses as shown in the image. Rocket boxes are a different style which seem to be equally if not more effective, however there were not enough in the study to provide conclusive recommendations.*

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■ Where and how to mount

- **Install multiple houses (three or more), providing more options for bats to choose from.**
- **The direction bat houses face doesn't influence their use. Sun exposure is more important, which can be affected by casted shadows regardless of direction.**
 - Install so there is a range of sun exposure: Full sun (8+ hrs/day), partial sun (6 to 8 hrs/day) and partial shade (2 to 6 hrs/day).
 - Roost switching is common bat behaviour, reinforcing why sites with multiple houses get the most use, allowing bats to choose the ideal temperature for the time of day/season.
 - When using dark colours (black in particular), it is important to ensure there is a light-coloured bat box option nearby. This is critical when boxes are placed in full sun – warm bat box conditions are beneficial for bats in cool spring weather, but full sun on dark boxes most often creates lethal temperatures predominantly in late summer.
 - If installing only one bat house, it's best located in partial rather than full sun.
- **If bats are crowding at the entrance of the bat house during the day, or are hanging outside the bat house, this is likely an indication the house is overheating and you should consider installing a shade mechanism and/or an additional adjacent more shaded box to which bats can switch.**
- **Install 2.75 to 3 m (9 to 10 feet) above the ground.**
 - A higher bat house is not detrimental but doesn't increase the chance of being occupied.
 - However, higher houses are less exposed to predation, especially from domestic cats that pose a threat to bats.
- **Install on a building when possible, especially human occupied (i.e. heated) buildings.**
 - If it cannot be placed on a building, then a pole is the next best option; however, bat houses on poles overheat more frequently, so poles should not be placed in full sun unless there is a nearby cooler bat box to which bats can switch (i.e., lighter colour / more shaded)
 - Houses on trees are less effective, being too obstructed/shaded by branches and easily accessed by predators.
- **Install in a dark location free from light pollution and out of thick vegetation.**
 - Bats may hunt near a light source, but they may not roost near one.



If you find an uninjured bat on the ground, use thick leather gloves to move the bat to a high area out of reach of pets and children, and it will likely fly away on its own after dark. If the bat does not leave or appears injured or lethargic, contact a local rehabilitation center for guidance.



If you find a deceased bat, please contact the Canadian Wildlife Health Cooperative.



Never touch a bat (alive or dead) with your bare hands.

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■ Timing

- Bat houses can be installed at any point in time, but it is best to install before bats return from hibernation sites in spring.
- When incorporated with actions to mitigate effects of an eviction, it is best to install bat houses as far in advance as possible. This gives the bats time to discover the new roost options.
- Leave up and maintain bat boxes for the long term, even if there are no bats present right away.
 - Bat houses often remain unoccupied initially. The longer a bat house is up, the more likely it gets used.
 - Bats are long lived and will return to the same roost for many years.
 - Bat houses are too cold for bats in the winter. The occupants leave for hibernation sites in fall (Sept to early Nov) and return in spring (March to May). While they are away it is a good time to perform any maintenance and clean out obstructions.

■ Where to get the ideal bat house:

- Check out our list of Canadian Wildlife Federation approved bat houses that meet the specifications revealed in this study.
- You can also build your own bat house that meets these guidelines, following the free downloadable design.

Both are available at HelpTheBats.ca!



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