

Got Bats?

7 Steps for Managing Bats in Buildings:
A Guide for Pest Management Professionals in BC



March 2015

Big Brown Bat photo © Jared Hobbs

Bats are neither rodents nor considered pests under BC law. They are classified as wildlife under the BC Wildlife Act and are protected from harassment and killing.

Acknowledgements

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This document may have been updated. See www.bcbats.ca for the most recent version.



Got Bats?

7 Steps for Managing Bats in Buildings

Background

All bat species in British Columbia (BC) are protected under the *BC Wildlife Act*. The purpose of this document is to provide consistent acceptable management practices for Pest Management Professionals (PMPs) in BC to reduce impacts on bats during bat control and bat removal activities in buildings and other human-made structures. These guidelines were developed in response to conservation concerns for bat species in BC, recent catastrophic population declines, and changes to the protection status of many bat species due to White Nose Syndrome (WNS) elsewhere in North America. These practices are recommended for use with all structure-dwelling bat species, regardless of their conservation status.

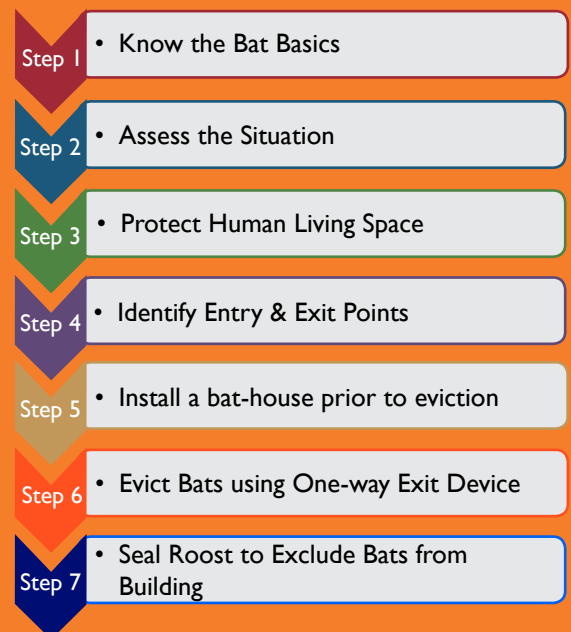
Buildings and other human-made structures can offer warm, safe shelters for some bat species, particularly females and their pups. In addition, buildings can serve as temporary night-roosts and migratory stop-overs. Buildings have become an important resource for bats where natural roosting habitat is limited. Consequently, bats are more likely to come into direct contact with people, sometimes presenting a nuisance or health concern.

PMPs have an opportunity to contribute to the conservation of bats by following simple guidelines for dealing with bats in buildings. PMPs regularly talk with the public and can be an important voice for bat conservation. PMPs are also an important information resource on bat colonies and are encouraged to communicate with their local community bat project or provincial government wildlife biologist to aid in management decisions, regardless of whether a bat colony is being evicted from a structure or not. Community Bat Project coordinators and provincial wildlife biologists, in turn, can provide additional resources and information on bats to homeowners and cooperating PMPs.

What's Inside this Guide

This document provides guidance on best practices for managing bats in buildings to promote bat conservation while successfully addressing homeowner concerns.

Below is an overview of the seven steps:



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Step 1: Know the Bat Basics

A great deal of misinformation exists about bats. PMPs have an opportunity to educate their clients on the significance of bats to humans and the environment, while dispelling common myths. The following information may be useful.

- Bats are neither rodents nor considered pests under BC law. They are classified as wildlife under the *BC Wildlife Act* and are protected from harassment and killing.
- Unlike rodents, bats do not build nests and they do not chew or claw their way into a structure, but instead take advantage of structural openings or areas of disrepair on the outside of a building.
- Bats are important to our ecosystems, and ultimately our economy. All bat species in Canada eat insects, including those insects that impact agricultural and forestry activities and those that are disease-spreading pests such as mosquitoes. During the summer, a bat can eat half its body weight in insects each night. One Little Brown Myotis can eat 600 mosquitoes per hour in a lab setting.
- Bats have inspired scientific advancements for humans including navigational aids for the blind, blood-clot medications, low-temperature surgery, and military sonar.
- Half of the sixteen species of bats in BC are of conservation concern due to population declines.
- Since the devastating fungus causing White Nose Syndrome (WNS) was introduced to eastern North America in 2006, an estimated 5.7 million bats have died from the disease. As of December 2014, WNS has been confirmed in 5 Canadian provinces and 25 US states but is not yet known to occur in BC.
- Bats are long-lived and have a low reproductive rate. Bats can live up to 30 years and most species in BC produce only one young per year. Therefore, it is very difficult for bats to recover from drastic population declines such as those caused by WNS.
- Rabies virus is a serious human health concern and several species of bats can carry the virus in BC. Although bats, like all mammals, can contract rabies, the naturally occurring infection rate has been documented at around 1% or less in common structure-dwelling species^{1,2}. The best way to avoid being infected by this virus is to avoid physical contact with bats.
- Histoplasmosis (a lung disease caused by the inhalation of *Histoplasma capsulatum* fungal spores from animal feces) has never been documented from bat droppings in BC.
- Bats do not carry bed bugs (*Cimex lectularius*) that are household pests. Bat bugs (*Cimex pilosellus*) look similar but stay in close proximity to bats and cannot complete their life cycle on humans. Bat bugs rarely bite humans, and cannot survive in the absence of their bat hosts.

Did you know?

White Nose Syndrome (WNS) is caused by a fungus? Fungal spores are easily transported from roost to roost on equipment or clothing. In regions of North America where WNS is present, it is critical that you decontaminate your equipment between bat roost sites to ensure you do not spread this devastating bat disease. Since WNS is not yet known in BC, these procedures are recommended but not currently required. However, Pest Management Professionals may wish to familiarize themselves with these practices to prepare for if and when they are required: <http://www.env.gov.bc.ca/wld/wldhealth/>

¹ Trimarchi, C.V. and J. G. Debbie (1977). Naturally occurring rabies virus and neutralizing antibody in two species of insectivorous bats of New York state. *Journal of Wildlife Diseases*, 13, 366-369.

² Pybus, M.J. (1986). Rabies in insectivorous bats of western Canada, 1979-1983. *Journal of Wildlife Diseases*, 22, 307-313.

Step 2: Assess the Situation

"[S]ome bats live in buildings, and there's no reason to evict them if there is little chance for contact with people."

-US Center for Disease Control (CDC)



A BIOLOGIST HOLDS A TOWNSEND'S BIG-EARRED BAT (*CORYNORHINUS TOWNSENDII*) FOUND DURING SURVEYS. PHOTO BY TODD CARNAHAN

Where are the bats roosting?

Are the bats inside the building or under roofing or another structure on the outside of the building? Bats may roost in many parts of a building structure including under roofing, siding, fascia boards, flashing and rafters, in cracks of the chimney or walls, behind shutters or under a porch roof (see below). Sometimes bats appear to be roosting inside a house, when in fact they are simply under roofing or fascia, and may not cause a problem for the homeowner. How 'tight' is the building? Are there lots of cracks and crevices allowing entrance to the building space or just a few? In some cases, such as cedar shake roofs, log houses, and A-frame houses, exclusion is extremely difficult. It may be more realistic to exclude bats from a certain portion of the building and let them remain in another section.

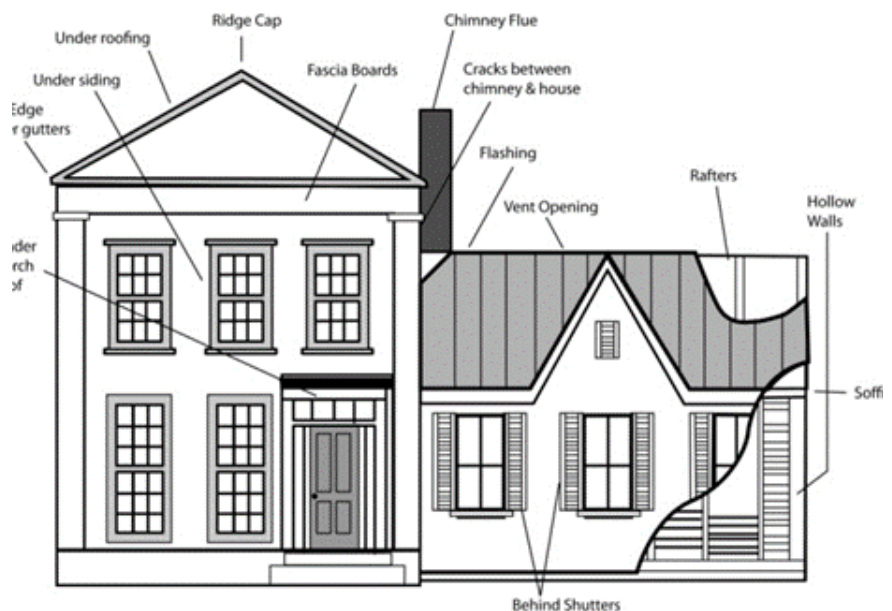


DIAGRAM OF A HOUSE SHOWING POSSIBLE ROOST SITES FOR BATS ³

Is this a night roost?

Night roosts are places that bats use temporarily during the night to rest between feeding bouts. Night roosts are often open spaces, including under bridges, archways above doors, covered patios, and carports. Residents rarely see bats at night roosts but instead observe droppings every morning. The biggest nuisance with night roosts is cleaning up the guano every morning. However, since guano makes an excellent fertilizer, it can be used on the garden. Alternatively, place a plant pot where the guano usually falls to avoid having to clean up the droppings, or place a shelf or gutter along the wall below the night roost to catch guano before it falls.

³ Drawn for the Kootenay Community Bat Project based on original drawing by Dr. Stephen C. Frantz, Global Environmental Options, LLC.

Step 2: Assess the Situation

Is this a night roost? (con't)

The presence of a night roost does not necessarily indicate that bats are inside the building and the limited use of a night roost is not usually a problem. Deterrents such as moth balls⁴, garlic bulbs, owl figurines and ultrasonic devices are not effective. There are several methods that may be effective to deter bats from using a night roost. These include:

- Leaving the area brightly lit.
- Installing a fan that blows on the wall where the bats are roosting (can be set up with a timer).
- Hanging orchard tape, flashing, mylar balloons or strips of tin foil that are able to move in the breeze.
- Attaching a slippery material (such as plastic sheeting) on the wall where bats come to roost to limit their ability to cling easily.
- Using aerosol dog and cat repellents on a particular spot (e.g. Critter Ridder[®]). Be sure to apply the spray when bats are not present. It will need to be re-applied regularly.

What species is present?

Identifying the species in the structure can inform eviction/exclusion timing and techniques. The most common species using buildings in BC are the Little Brown Myotis, Yuma Myotis, and the Big Brown Bat. The rare Townsend's Big-eared Bat is also found in buildings and is easy to identify because of its long ears and tendency to roost in clusters on rafters in very open spaces. This habit also makes them vulnerable to human disturbance or injury, either by intentional or accidental means. Long-eared Myotis, Long-legged Myotis, Californian Myotis, Pallid Bats, and Northern Myotis will also use buildings but are not found as often in such roost types. For a list of bat species by region of BC, see www.bcbats.ca.

Please note: If you observe bats with a white fungus on their noses and/or wing membranes please contact your community bat project or a local provincial government wildlife biologist immediately. See www.bcbats.ca for contact information.

Is a bat eviction necessary?

The US Center for Disease Control (CDC) states that “some bats live in buildings, and there’s no reason to evict them if there is little chance for contact with people.”⁵



MODIFICATIONS FOR BAT ROOST SITES: PLASTIC SHEETING IN ATTIC TO FACILITATE GUANO REMOVAL AND REDUCE SMELL. PHOTO CREDIT JULIET CRAIG.



MODIFICATIONS FOR BAT ROOST SITES: TARP HUNG TO PREVENT GUANO FROM FALLING ON HAY. PHOTO CREDIT JULIET CRAIG.

⁴ Note: New guidelines from Health Canada for moth ball use prohibit their use outdoors or outside of a closed container. <http://www.healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2012/13669a-eng.php>

⁵ Center for Disease Control. <http://www.cdc.gov/rabies/bats/management/>

Step 2: Assess the Situation



YUMA MYOTIS (*MYOTIS YUMANENSIS*) ARE A SMALL BAT COMMONLY FOUND IN BUILDINGS. PHOTO CREDIT KERRY O'GORMAN.



TOWNSEND'S BIG-EARED BATS (*CORYNORHINUS TOWNSENDII*) ARE OCCASIONALLY FOUND IN BUILDINGS. PHOTO CREDIT JULIET CRAIG.

The problems that can be associated with bats in buildings are often a by-product of bats rather than the bats themselves. To assess whether bat exclusion is required, work with the homeowner to identify the problems that the bats are creating such as noise, odour or guano accumulation. Some people have lived with bats in their attic for decades since they do not come into contact with the bats and there are no issues of noise or smell. In other cases, where bats persistently find ways into the human living spaces or where guano cannot be regularly cleaned out, exclusion may be the best option. In situations where bats do not have contact with humans, the primary issue is usually containment of guano.

Containment can often be achieved at relatively low cost. It is also often the best option when exclusion from drafty buildings is virtually impossible. There are strategies to address these issues without excluding bats:

- Accumulated guano can be removed annually. Use appropriate respiratory protection in dusty enclosed areas. Guano can be used as a garden fertilizer since it is rich in nitrogen.
- Insulation stained by guano or urine can be replaced and plastic or a pre-sealed plywood floor installed along human access routes and under roost(s) to catch guano and facilitate annual removal.
- Attic access for clean-up can be improved. Consider making a large entry hole, installing pull-down stairs, providing access from the outside of the house, or other modifications to make it easy to get inside to clean when necessary.
- Bat - human contact can be prevented by ensuring that all openings between the bat roost site and human living quarters are properly sealed. Seal gaps (e.g. with caulking, aerosol foam, weather stripping or screening) where guano (and bats) can enter living quarters, particularly around chimneys. This will reduce the entry of odours and guano and will prevent bats from accessing the rest of the house. Identifying entry and exit points of the bats will help ensure that modifications do not interrupt bat access to the roost.
- Unsightly guano deposits in conspicuous locations, such as on a front entrance or deck, can be deflected or caught by installing shelves, rain gutters or a planter below the roost site.
- Do not use sticky fly ribbon, glue traps, bird netting or tape since bats can become entangled and killed.

If bats are not causing any problems, or the problems can be adequately mitigated using the steps above, an eviction may not be required in order to satisfy the homeowner.

Step 3: Protect Human Living Space

Prevent bat-human contact to protect concerned homeowners and public health by sealing gaps (e.g. with caulking, aerosol foam, weather stripping or screening) where guano and bats can enter living quarters, particularly around chimneys. This will reduce the entry of odours and guano and will prevent bats from accessing the rest of the house.

Even during the time that pups are born (maternity season) or when bats are suspected to be hibernating in the building, these “interior seals” can be established as long as bats can still exit their roost site. Identifying entry and exit points for the bats will help ensure that modifications do not interrupt bat access to the roost.

Locate openings (typically areas where air flows) leading into the living space from attics, garages, walls, or any place that bats are roosting.

Entry/exit points can be as small as 15 mm (5/8”) round or 6 mm (1/4”) wide and 19 mm (3/4”) long that open into the living space. Likely openings may include:

- Attic hatches and doors
- Chimneys
- Fireplaces
- Around piping or plumbing
- Open windows or loose windowsills
- Openings around air conditioners and ducts
- Louver fans
- Screens in disrepair
- Pet doors



COLONY OF YUMA MYOTIS IN ATTIC. PHOTO BY JULIET CRAIG.



BATS OCCUPYING BUILDINGS MAY NOT NEED EVICTION IF HUMAN LIVING SPACES CAN BE PROTECTED. PHOTO BY JULIET CRAIG.

The BC Community Bat Project network was established in 2014. To learn more and locate a bat project in your region, see www.bcbats.ca

Step 4: Identify entry & exit points

Erecting alternate roost structures (i.e., specially-designed bat-houses) nearby prior to eviction for displaced bats is strongly recommended. Bats will be much less persistent in trying to re-enter their roost if they have another attractive roost site nearby.



VIEWING A NURSERY BAT-HOUSE LOOKING UP INTO HOUSE FROM BELOW. PHOTO BY JULIET CRAIG.

Bats can enter a building through any crevice 12 mm (1/2") or wider. Bat-sized crevices may be found on all sides of a building and are often not visible from ground level. Often the homeowner will know the entry and exit points for the bat colony because they have heard or seen them at dusk.

An evening emergence survey ("bat watch" at dusk) can help to identify the bats' primary access and exit points, engage the homeowner, and gather pre-eviction baseline data such as an estimate of the number of individuals at the roost. An evening emergence survey involves watching the building from dusk until full dark during summer months. Having more than one observer will ensure that both sides of the building can be monitored. This survey should be followed up by a close visual inspection to locate secondary entrances and other potential access points.

Entry points can usually be identified in an attic by going inside and looking for points where light is entering the attic space. Entry points can also be identified on the outside of the building by the presence of staining (a yellow or brown stain on the wall below the crevice) and the presence of bat guano stuck to the wall.

If there are no obvious entry points, assess whether this is actually a night roost (refer to Step 2). As well as current entry and exit points, it is important to identify alternative potential entry and exit points that bats may use if their current entrance routes are sealed.

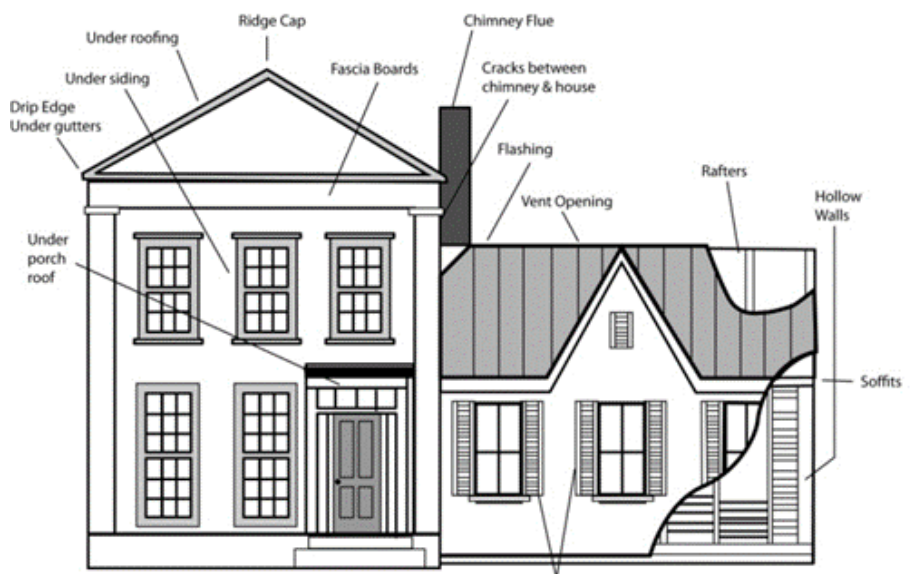


DIAGRAM OF A HOUSE SHOWING POSSIBLE ROOST SITES FOR BATS⁶

⁶ Drawn for the Kootenay Community Bat Project based on original drawing by Dr. Stephen C. Frantz, Global Environmental Options, LLC.

Step 5: Install a Bat House

Because bats naturally return to the same location year after year, individuals may attempt to re-enter the structure they have been excluded from or spend precious time and energy searching for another roost. Since bats can squeeze into very small spaces, the success of an exclusion is higher if the bats are provided with an alternative roost site. Erecting alternate roost structures (i.e. specially-designed bat-houses) nearby prior to eviction for displaced bats is strongly recommended. Bats will be much less persistent in trying to re-enter their roost if they have another attractive roost site nearby.

Ideally, bat-houses should be erected a few months to a year before a scheduled exclusion to give bats time to find and explore the new roosting option. Bat-houses should be installed as close to the original roost as possible (e.g. less than 100 m) to maximize the likelihood of bats finding the new habitat. See Resources for more information.

Some of the key attributes of successful bat houses include:

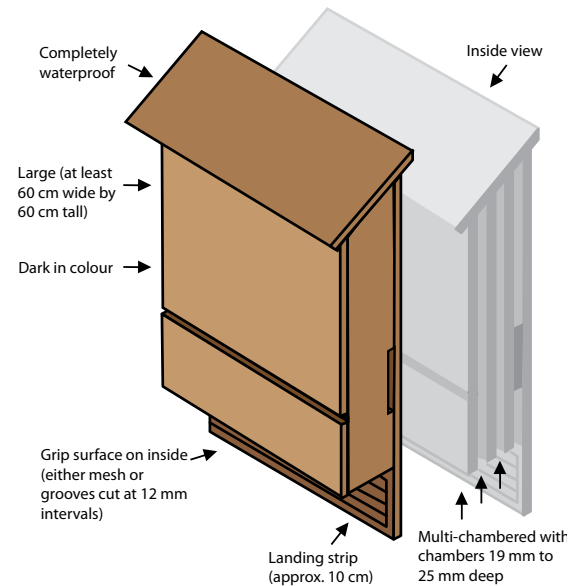
- Multi-chambered (ideally four - so there is more than one crevice that bats can use).
- Chambers 19 mm to 25 mm (3/4" to 1") deep (too shallow and bats can't enter; too deep and it's not warm enough).
- A surface that provides an easy grip on inside (either fine wire mesh, window screening or horizontal grooves cut at 12 mm (1/2") intervals).
- Vertical landing strip (approx. 10 cm long) on the bottom of the back wall to allow bats to land and crawl inside.
- Completely waterproof.
- Large (a minimum of 60 cm wide by 60 cm tall).
- Dark in colour (stain the exterior to absorb maximum heat from the sun).

There is no guarantee that bats will use a bat-house, but research has shown that bat-houses can be successfully occupied during and after an eviction^{7,8}. Choosing the proper location, placement, design, color, and materials are all important factors for increased success. Bat-houses in most regions in BC should be stained black and be situated to be south-facing. Bat-houses installed in very hot areas of the province, including Lillooet, south Okanagan, and parts of the Kootenays should be stained a chocolate brown colour. Guides to bat-house design and placement can be found in the Resources section.

In summary, bat-houses should be placed:

- As high as possible (at least 3 1/2 m (12') high)
- South facing to ensure high solar exposure – ideally bat-houses should receive at least 6 to 10 hours of sun.
- In an uncluttered location that does not have branches, buildings, or poles in front of or below it.

KEY FEATURES OF A BAT HOUSE



KEY FEATURES OF A BAT-HOUSE DEMONSTRATED WITH FOUR-CHAMBER NURSERY HOUSE

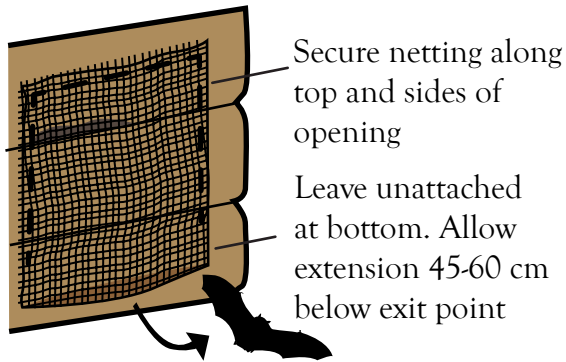


ROCKET BOX ON POLE (TOP); FOUR-CHAMBER NURSERY BAT HOUSE INSTALLED ON SIDE OF BUILDING (BOTTOM). PHOTO BY JULIET CRAIG

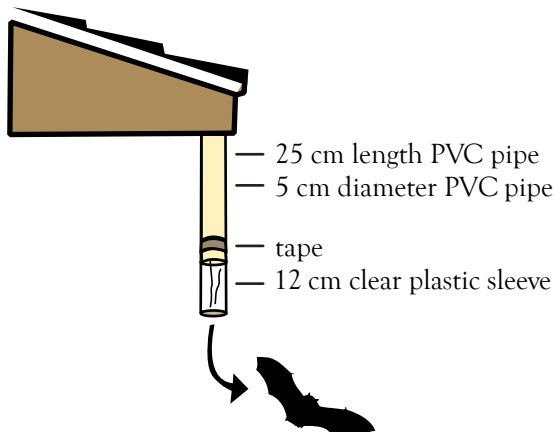
⁷ Kiser, M. and S. Kiser (1999). Bat-houses and exclusions in British Columbia. Bat-house Researcher, 7, 3-4.

⁸ Brittingham, M. C. and L. M. Williams (2000). Bat boxes as alternative roosts for displaced bat maternity colonies. Wildlife Society Bulletin, 28, 197-207.

Step 6: Evict Bats using one-way exit device



ONE-WAY EXIT DEVICE FOR VERTICAL SURFACE USING FIBERGLASS MESH SCREEN.



ONE-WAY EXIT DEVICE USING PIPE EXIT DEVICE FOR HORIZONTAL SURFACE.

One-way Exit Devices

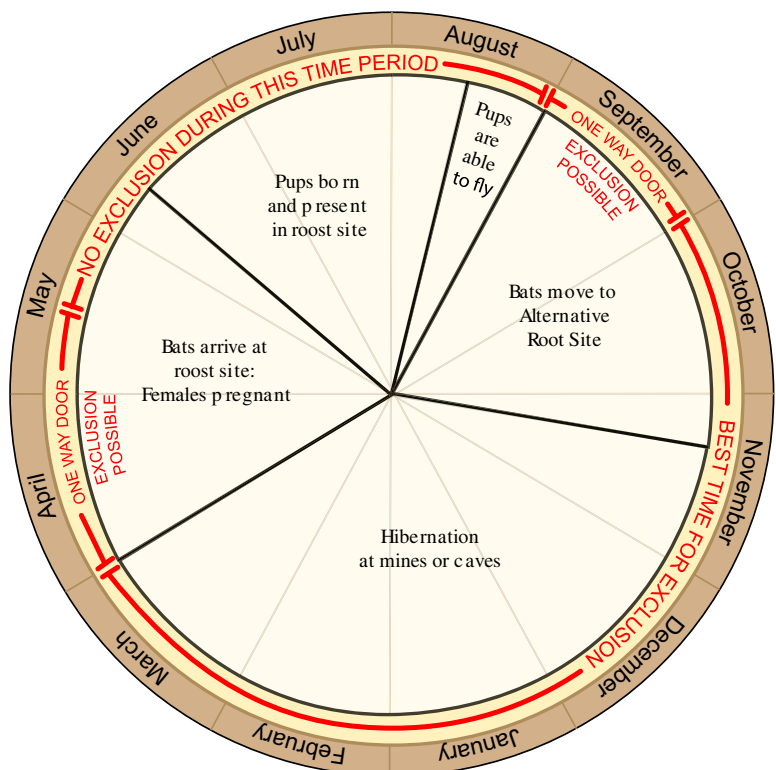
One-way exit devices installed at an appropriate time of year allow bats to leave the structure, but not re-enter and are an acceptable and effective means of eviction. One-way exit devices must be constructed out of a material that does not have any sharp edges or parts that could damage a bat's wing or form any spaces in which bats could become trapped. These devices can be made from a number of materials including light weight polypropylene netting (with less than 1 cm (1/2") mesh) or plastic sheeting.

The device is placed over the entry opening and attached on three edges while the fourth (bottom) edge remains open and hangs well below the entrance. When bats fly out of the roost site, they will contact the plastic or mesh, and slip downwards past the bottom edge. However, when they try to fly back inside, they will push against the mesh/plastic, and not be able to enter the space.

Another method, particularly useful for vertical entry points, is to attach one end of a plastic tube (PVC pipe, an empty caulking tube or flexible tubing) at least 5 cm (2") wide and 25 cm (10") long over the mouth of the opening. An optional clear plastic sleeve can be added to the bottom end of the pipe. Bats will be able to exit through the tube by sliding down it but they will not be able to re-enter since the tube is too narrow to fly through and too slippery to climb up.

Commercial "bat cones" are also available for this purpose.

ONE YEAR CYCLE OF BATS



TIMING CALENDAR FOR EXCLUDING BATS FROM STRUCTURES IN BC.

Step 6: Evict Bats using one-way exit device

Timing Evictions

The timing of using a one-way exit device is critical to ensure that bats are not inadvertently trapped inside the roost structure. **Evictions and exclusions are not permitted during the maternity season from May 1 to September 1** (see sidebar). Bat pups (young-of-the-year) are generally born in early- to mid-summer, following a roughly two-month gestation period. Pups nurse for about four weeks, or until they begin flying. Young bats may not be weaned or able to feed on their own until mid- to late-summer. Attempts to evict or exclude bats at this time can result in the death of flightless young, as well as an increase in the number of adult bats and orphaned pups that enter the living space, potentially heightening the risk of human/bat contact and, rarely, rabies exposure. Insects and foul odors may also result from the death of entrapped bats.

Ideally, **evictions should take place in fall (September 1 to November 1)** when bats are all flying adults, long periods of dormancy have not yet begun, and weather is still conducive to movements for locating alternative roosts. During these months, use a flashlight to carefully check any crevices, corners, and cracks to see if bats are present. Ensure that no bats are inside before sealing the roost. If there is any question that bats may still be using the building (e.g. you cannot see completely inside the roost), use a one-way exit device. If bats are still in the roost, they are emerging to fly on a semi-regular basis, making one-way doors an effective tool for clearing the building of bats prior to exclusion.

Because not all bats will exit every night, **one-way exits should be left in place for a minimum of five to seven nights in the fall/spring months**, including at least three consecutive nights of weather conducive to bat flight (temperatures above 10°C, winds below 16 km/hr, and no sustained or heavy rains) before they are removed and the holes are sealed. If weather conditions are not conducive to bat flight while the devices are in place, the time period should be extended until at least three consecutive good weather nights are achieved. If time permits, it is also suggested that someone (e.g. the homeowners) watch the vented exits from dusk until full dark on the last night before the hole is permanently sealed to verify that no bats remain inside the roost. If bats are found to have re-entered the roost, or if the PMP discovers that a vent has detached or become loose enough to allow re-entry, then the device should be re-installed and left in place again for the five night minimum.

Although bats generally leave building structures during winter months to hibernate in mines or caves, **some buildings may have bat colonies present during winter months**. If the exclusion is occurring between November and April, use a flashlight to look into any crevices, corners, and cracks to see if bats are present. Hibernating bats can be very difficult to see since they move into small crevices. If there are bats present, contact your community bat project or a provincial wildlife biologist to report winter bat use of buildings. See www.bcbats.ca for contact information.

Evictions and exclusions are not permitted during the maternity season from May 1 to September 1.

Ideally evictions should take place in fall (September 1 to November 1).



BAT COLONY IN AN ATTIC. A ONE-WAY EXIT DEVICE INSTALLED AT THE CORRECT TIME OF YEAR MAY BE AN APPROPRIATE APPROACH TO EXCLUDING BATS. PHOTO BY JULIET CRAIG.

Step 7: Seal Roost to Exclude Bats



A BIOLOGIST INSTALLS A BAT HOUSE ON THE SIDE OF THE BUILDING PRIOR TO SEALING THE ROOST. PHOTO BY KATIE BELL.

Once bats have been successfully evicted from the building, the only effective way to permanently prevent re-entry is to perform an exclusion where all entry and exit points are sealed. Seal entry and exit points with products such as caulking, aerosol foam, weather stripping or screening. A complete exclusion, by sealing up any secondary holes, cracks, or crevices in the structure that could serve as potential entry/exit points is completed when bats have migrated to their over-wintering sites. Ideally, exclusion is carried out in combination with the installation of a bat-house.

Clean out all guano and stained insulation if there are issues with odour. Be sure to wear a well-fitted mask to avoid inhaling guano and dust particles (guano is not poisonous but inhaling small particles of any kind should be avoided). Consult a building professional to ensure that all modifications follow the BC Building Code.

Contractors should be prepared to make multiple visits throughout the exclusion process, between initially setting up the vent(s), sealing crevices on all sides, and removing vents and sealing entrances. Even for experienced professionals, it may take several tries to successfully bat-proof a building. It can be difficult to locate and seal all of the tiny openings that bats may squeeze through. Bats may be very persistent in finding alternate routes into buildings once their primary routes are blocked off, so exclusion can be extremely difficult.⁹

Methods that include poisoning, trapping (e.g. cages, sticky traps), exterminating, translocating, or in any other way harming, harassing, or killing bats are illegal under the *BC Wildlife Act* and can result in increased cost to the homeowner.

**For more information, see
www.bcbats.ca**

Methods that include poisoning, trapping (e.g. cages, sticky traps), exterminating, translocating, or in any other way harming, harassing, or killing bats are illegal.

⁹ An excellent guide called "Simple Bat Eviction" can be ordered from www.BatHouseGuy.com.

Beyond Eviction

There are several activities that Pest Management Professionals can do to support bat conservation in their profession:

- Contact your local community bat project about collecting guano samples from local bats. Wearing gloves, collect guano samples in paper envelopes (with the address, date, and collector recorded) that can be used for future research on bat identification and WNS spread. Submit them to your community bat project.
- Provide bat-house resources to homeowners to encourage installation.
- Encourage homeowners to participate in the Annual Bat Count to monitor bat populations on their property.
- Provide homeowners with their community bat project contact for more information on how to get involved in bat conservation or promote bat habitat on their property.

Definitions

Day roosts (including maternity roosts) are sites where bats gather to sleep and live during the day. They can either consist of a lone bat (often a male or non-reproductive female), or a colony of females (maternity roost) and their offspring.

Emergence survey is watching for bats to emerge from their roost site at dusk to determine the exit points for the roost site, how many bats are in the colony, and if bats are still present.

Eviction refers to the use of one-way doors to prevent bats from re-entering a structure after they leave the roost at night.

Exclusion refers to closing gaps and sealing holes to prevent bats from entering or re-entering a structure.

Guano refers to bat feces.

Maternity roosts are sites where multiple females gather. These roosts are usually easy to detect due to noise, odour, or guano and include attics, barns, sheds, siding, and other enclosed spaces.

Night roosts are sites where bats rest between foraging bouts to digest before flying again. Night roosts are usually open on at least one side and often face the water if nearby. They include structures such as door ways, car ports, and decks.



TOWNSEND'S BIG-EARED BAT (*CORYNORHINUS TOWNSENDII*). PHOTO BY JARED HOBBS



YUMA MYOTIS (*MYOTIS YUMANENSIS*). PHOTO BY JARED HOBBS

Additional Resources



LITTLE BROWN BAT (*MYOTIS LUCIFUGUS*). PHOTO BY JARED HOBBS



LONG-LEGGED BAT (*MYOTIS VOLANS*). PHOTO BY JARED HOBBS

BC Information

- Community Bat Programs of BC: www.bcbats.ca. Plans for BC appropriate bat-houses can be found here as well.

Bat-house Plans

- Four-chambered nursery bat-house:
<http://www.batcon.org/pdfs/bathouses/FourChamberNurseryHousePlans.pdf>
- Two-chambered rocket box:
<http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1001&context=icwdmother>

Both these plans can also be downloaded from www.bcbats.ca

Bat-house design and placement

- Bat Conservation International
<http://www.batcon.org/resources/for-specific-issues/artificial-roosts>
- Organization for Bat Conservation
<http://www.batconservation.org/>
- Bat Conservation and Management
<http://www.batmanagement.com/Batcentral/batcentral.html>

Information about White-nose Syndrome

- US White-nose Syndrome website
<http://whitenosesyndrome.org/>

WNS Decontamination guidelines

- https://www.whitenosesyndrome.org/sites/default/files/resource/national_wns_revise_final_6.25.12.pdf

Rabies and other health concerns

- BC Centre for Disease Control
http://www.bccdc.ca/dis-cond/a-z/_r/Rabies/overview/Rabies.htm



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