



Living with Bats in British Columbia

Examples of safe, secure roost sites
for bat colonies in buildings



BC Community Bat Program
www.bcbats.ca



Living with Bats

Why maintain bat colonies in buildings?

Bats are an important part of British Columbia's biodiversity and are important to our economy. All BC bats feed exclusively on insects and spiders, and are vital for maintaining healthy ecosystems. Many pests that affect people, gardens, forests, and crops are among bats' favourite foods, saving the forest and agricultural industries in North America billions of dollars annually.

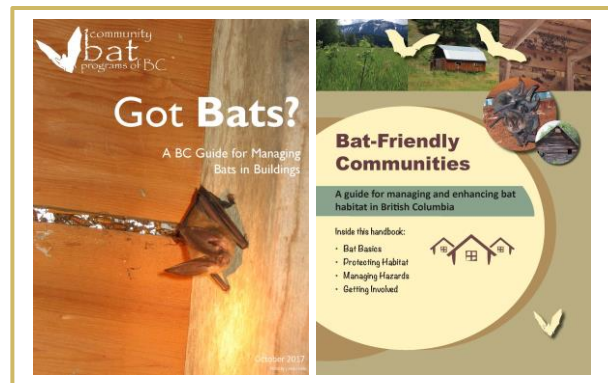
Unfortunately bats face many threats including habitat loss and emerging diseases. They face high mortality from white-nose syndrome, a fungal disease deadly to bats. Introduced into North America in 2006, this disease has killed millions of bats so far, and was confirmed in Washington State in 2016. Northern Myotis (*Myotis septentrionalis*) and Little Brown Myotis (*Myotis lucifugus*) are two of BC's bat species that are listed by the Species at Risk Act as Endangered in Canada because of white-nose syndrome.

Several of our bat species live in close association with humans, and a few species, such as the Little Brown Myotis, rely extensively on human-made structures for roosting and raising offspring. Summer roosts, known as maternity roosts, are used by females to give birth to and raise their pups. Each female usually gives birth to only one pup a year. Buildings provide high quality roosts, safe from predators, and have warm and stable temperatures that may speed the development of young pups. Protecting bat roosts helps ensure healthy and resilient bat populations, and provides safe roost sites for bats. Stewardship and management of human-made roosts is vital for the future of bats in the province.

In the majority of cases, bats and humans can safely co-exist. Bat colonies use a variety of structures for roosting, including attics, soffits, spaces in walls, loose flashing and ridge caps, sheds, barns and carports. Bats can be found roosting in or on buildings throughout much of the year; however, most occurrences are between April and August, when females seek a maternity roost. The examples in the following pages illustrate some of the possible scenarios for living safely with bats in a variety of buildings and focus on summer maternity roosts.

History of bats in buildings in BC

Since 2014, the BC Community Bat Program has worked to support landowners who have bats in buildings. The 'Got Bats? Managing Bats in Buildings' guide promotes retaining bat colonies in buildings, when possible. Our Bat-friendly Communities approach goes beyond retaining bats in buildings. It encourages not only protection of natural and artificial roosts but also emphasizes habitat enhancement, reduction of threats to bats, and education as part of bat conservation.



Bat roosts in buildings are now common across BC. There are 256 roost sites in buildings monitored during the Annual Bat Count by landowners and the Community Bat Program volunteers, including 201 houses where bats and people co-exist in the same building. Many more colonies have been reported in buildings but are not currently being monitored.

Importance of building roosts for bat conservation and research in BC

There are seven species of bat that have been identified roosting in buildings in BC. The majority of colonies are Little Brown Myotis, Yuma Myotis, and Big Brown Bats. Less common are California Myotis, Townsend's Big-eared Bats, and rarely there are colonies of Long-eared Myotis or Long-legged Myotis. For these bat species, buildings provide secure roosting habitat that increases the chances of pup survival.

Bat colonies in buildings may also benefit bats by providing accessible sites for educational programs about bats. They may attract significant numbers of tourists to view or learn about bats. The Peachland Visitor Centre is an excellent example of an education and awareness program based on the local colony, and attracts 4000+ bat tourists each year, helping the local economy.

Research and monitoring at bat colonies in buildings can provide information on roost temperature preferences, arrival and departure dates, and timing of the birth of pups. This information helps biologists offer regionally-appropriate advice for managing bats in other colonies. Building roosts also provide accessible sites for monitoring for white-nose syndrome in British Columbia. All the roost sites highlighted in this document contribute guano samples and Annual Bat Count data to the provincial surveillance program for this disease.

Mitigating impacts and risks of bats in buildings

Bats often live in buildings without causing any issues to landowners. However, the presence of a bat colony may raise some questions. These are discussed below and include human health concerns, issues with noise, smell, and/or guano accumulation, and potential harm to bats. You can find more detailed information on addressing these concerns in the [Bat-friendly Communities Guide](#) and [Got Bats? A BC Guide to Managing Bats in Buildings](#).

Human health concerns

When left alone, bats are not a danger to people. However, there are important procedures and safety precautions you should be aware of to ensure you and the bats remain safe.

Never touch a bat with your bare hands. Although extremely rare, bats may carry rabies and can transmit the virus through a bite or scratch to humans. Any direct contact with a bat must be reported immediately to Public Health or your physician.

Prevent contact between humans or pets and bats by ensuring that bats cannot access human living or work space. Bats do not chew but can fit through a space as small as 15 mm across. Block all access points where bats may come into human spaces using mesh, fabric, aerosol foam, caulking, weather-stripping, fixing trim, or by capping chimneys at the top. This can be done at any time of year, but ensure bats aren't trapped and can still access both their roost site and the outdoors. Excluding adult bats from their roost in spring/summer will result in the death of pups trapped inside and must be avoided.

The U.S. Centre 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"*.

Bat guano and urine are not considered health hazards in British Columbia, but in very warm, humid parts of North America, guano may be associated with a lung disease known as histoplasmosis, which is not known to occur in British Columbia. To be safe, appropriate respiratory protection, gloves, and coveralls should be worn if disturbing the feces of any animal, especially in confined spaces. Wetting the area prior to cleaning (with a 10% bleach/water solution) will reduce dust.

Noise

Bats colonies can be noisy, with audible social calls in the roost site and the noise of bats moving around. Mitigating noise can be done with traditional sound-proofing methods or insulation, or consider a partial exclusion to restrict bats to a section of the roost site where the noise will not bother humans.

Smell and guano

Guano and urine can smell, particularly if they soak into wood and insulation. Managing or removing guano and urine annually will remove the smell associated with a roost site. Consider using thin plywood to cover insulation, and a flat plastic tarp to catch guano for easy removal. Improve access to the roost site to make yearly cleaning easier. Clean markings on walls regularly to prevent staining.

A roost with 2000 bats produces on average two large garbage bags (300 litres) of guano each year.

Bat health concerns

Roost sites may pose hazards to the bats using them. Ensure your roost site is safe by screening chimneys or vents on the outside to avoid entrapment, never using sticky traps, and removing any empty pails or buckets that bats may become trapped in. If you own a cat, keep it indoors. Cats are frequent predators of bats, so keeping them separate saves bats and protects cats from possible exposure to rabies.

Best management practices for maintaining bats in buildings

- ☒ Ensure the building is safe for humans by separating bat and human living spaces.
- ☒ Mitigate any issues associated with the bats.
- ☒ Remove or reduce hazards to bats using the roost.
- ☒ Maintain the building as needed to support long-term occupancy by bats.
- ☒ Conduct any work or renovations when the bat colony is not present. See information on timing windows in [Got Bats? A BC Guide to Managing Bats in Buildings](#).
- ☒ Participate in the [BC Annual Bat Count](#).
- ☒ Record information on arrival and departure dates and inform the Community Bat Program.
- ☒ Participate in local research, education, and/ or white-nose surveillance programs.

Contact the [BC Community Bat Program](#) for more information.

Acknowledgements

The information in this brochure was graciously provided by landowners and managers, and compiled and edited by members of the BC Community Bat Program. Funding for this project was from the BC Ministry of Environment and Climate Change Strategy. The BC Community Bat Program also receives funding from Habitat Conservation Trust Foundation, Forest Enhancement Society of BC, Habitat Stewardship Program for Species at Risk, and many local and regional funders.

Living with Bats in an Attic

Location: Metchosin Community Hall, Metchosin
Colony size: 1200
Species: Yuma Myotis, Little Brown Myotis

History

When the original 1880's Metchosin Hall burnt down, the current hall was built on the same site and community members enjoyed its grand opening in December 1939.

There is no record of when the bats moved in, but they have clearly roosted in the attic for many years. Since 2011, Metchosin has hosted an annual "bioblitz", where the entire community is invited to participate in wildlife counts and workshops on biodiversity. The event strengthened attitudes about wildlife in the community and the timing was perfect to create a bat information centre at the hall and to promote bat education and conservation.



The Metchosin Hall has provided a secure roost site to hundreds of bats for at least 30 years, and likely longer. Hall Committee member Steve Gray says, "It's great that it's in a public space, as that has prompted the board to get engaged in bat outreach and conservation. "

In October 2018, the Metchosin Hall Society hosted a well-attended Bat Education Day with the Habitat Acquisition Trust to inform the local community about the roost. The event provided all-ages learning opportunities about bats and other local fauna and flora, discussed other examples of leaving bats in-place, and offered bat houses for sale to participants.

Management actions

The insulation on the attic floor is now covered by plastic tarps to collect guano. The tarps only cover part of the floor which ensures any pups that fall from the rafters can crawl to the wall and return to the roost site. Habitat Acquisition Trust works with local volunteers to remove guano each fall.

Contributions to bat conservation and research in BC



Bats access the attic through a vent. The opening is screened to prevent access by larger animals.

Since 2016, Habitat Acquisition Trust has organized BC Annual Bat Count at the site and local volunteers count the number of bats emerging from the roost. The public is invited to join the bat counts or simply enjoy watching the bats emerge. Potluck dinners prior to the counts may become a regular feature, providing an opportunity to discuss approaches to bat conservation.

Visitors will soon be able to observe the bats via a live webcam. This will provide information to researchers about bat ecology, including spring arrival, the timing of pupping and late summer departure dates. This information will help biologists offer regionally-appropriate advice for managing other bats in colonies.

Living with Bats in an Attic

Location: Visitor Centre, Peachland
Colony size: 2000
Species: Yuma Myotis, Little Brown Myotis



History

The Peachland Historic Schoolhouse, built in 1908, was used as a school until 2002. Vacant for 10 years, the restoration of the historic building in 2012 revealed a large bat colony in the attic. The Peachland Chamber of Commerce and the District of Peachland worked to preserve and protect the bat roost during renovations. The Bat Education and Ecological Protection Society (BEEPS) was created to promote the protection and preservation of bats in Peachland, and to educate the public as a means of achieving these goals.

"The Peachland bats and the Legends of the Lake Interpretive Centre have become a beloved tourism draw that has attracted people locally, regionally, provincially and internationally. It's Peachland's unique selling point. We see over 4,000 visitors a year who want to know about all things bats!" – Jennifer Clute, Tourism Advisor, Peachland Visitor Centre

The Peachland bats are now a popular tourist attraction. From May through August, visitors gather to watch the bats emerge and volunteer with Annual Bat Counts, as well as observe the bats inside the colony via a webcam. At any time of year, visitors can explore educational displays and an interpretive bat walk.

Management actions



The bats use the attic vent to access the roost space, which is completely isolated from the rest of the building

A wooden floor, covered by tarps, was added to the attic to cover the floor trusses. This prevents any pups that fall down from becoming trapped in insulation, and allows safe and easy collection of guano. Tarps are laid flat to ensure any pups that fall from the rafters can crawl to the wall and return to the roost site. The hatch that allows human access to the attic is well-sealed, and no bats, guano, urine, or odours travel down to the lower level of the building. The Peachland Volunteer Fire Crew accesses the roost space each fall to remove guano.

Contributions to bat conservation and research in BC

The Peachland Chamber of Commerce and BEEPS have showcased the bats for tourism and educational purposes. Each year, thousands of people participate in the numerous public educational programs. The colony also supports local research to help biologists offer regionally-appropriate advice for managing bats in other colonies. Temperature monitoring inside the attic has provided information on the roosting conditions used in the Okanagan. The webcam provides information on bat ecology, including spring arrival, late summer departure dates, and the timing of pupping.

"Refurbishing the Peachland Historic School led to an educational program that continuously works towards bat habitat preservation and education, centering around the large maternity colony residing in the attic." – D. Hartford, President of BEEPS

Living with Bats in an Attic

Location: Community building, Denman Island
Colony size: 700
Species: Yuma Myotis, Little Brown Myotis,
Long-eared Myotis



"Sharing our building with bats is easy as they are silent neighbours. It's easy to forget that they are there" - C. Hunter, Denman Island Spinners and Weavers

History

Built in 1912 and enlarged in 1936, Denman's old school housed students until 1990. Now the Marcus Isbister Old School Centre is a busy hub for three community groups as well as the Denman Free Store, Recycling Centre and Saturday Market. Renovations in 1993 led to the discovery of a large bat colony. Protecting this colony became the focus of one of the Centre's tenants, the Denman Conservancy Association.

"Bats are amazing creatures that are under great stress for their very survival. I feel a special obligation, and honour, since these colonies have chosen our building for their home" - D. Critchley, Islands Trustee

Initially, conservation efforts focused on community education about bats and the annual guano cleanup. In addition, the bats were mist-netted outside the school for species identification. Initial DNA analysis in 2013 revealed four species including Big Brown Bats, but since re-roofing, just the three Myotis have been confirmed.

With the beginning of the Denman Hornby Bat Project in 2016, the Old School has become a summer evening tourist attraction.

Management actions

A plywood floor has now replaced the temporary tarps installed to cover the rafters and facilitate the annual fall guano cleanup. Re-roofing was scheduled to occur when the bats were absent. At that time, new "bat access" entrances were put into the old soffit area, but bats still use holes around the old wooden soffit and fascia boards. To improve bat access, new bat entrances are planned and will be tested before these old boards are replaced.

"The attic is separate from the lower level, thus allowing full use of the former school space for a variety of community activities. This unusual combination of uses provides a unique opportunity to educate members of the community about these seldom seen mammals" - L Bell, former Islands Trustee

Contributions to bat conservation and research in BC

The Old School's major contribution to bat welfare, other than housing the colony, is community education. Bats exiting the Centre put on quite a display and some bats, especially juveniles, occasionally wander in open windows or doors. Visitors and regular community group users have learned how to live with and appreciate bats in our community.

"Helping to steward the bats in the Old School is a real pleasure as well as an important responsibility" - J. Balke, Biologist, Denman Conservancy Association

"It's great to leave an evening meeting and see all the bats flying around" - G. Michin, Chair of the Old School Management Committee

Living with Bats on Exterior Walls

Location: Clubhouse, Vancouver
Colony size: 50
Species: Yuma Myotis, Little Brown Myotis

History

The Vancouver Rowing Club is the oldest amateur sports organization in Vancouver. The club was founded in 1866, with the clubhouse moving to its current location in Coal Harbour, within Stanley Park, in 1911. The building was designated a heritage site in 1986.

"Bats are seen nightly in the summer over the water, yet I don't think many of our members are even aware that bats use our facility" – VRC General Manager



The Vancouver Rowing Club has provided a long-term roost for bats in the heart of the city.

The caretaker discovered the bat roost in 2008 and simply added guano management to his weekly duties. As a result, the Vancouver Rowing Club colony was unknown to many club members. Although bats can be found in various locations, most prefer to roost in gaps under the railings along a busy stairwell.

Management actions

Since the bats roost on the exterior of the building, little maintenance is required. Guano falls from the railing onto the side of the building, within a stairwell, and on the top window ledge, but is easily cleaned off by spraying with a hose.

"No harm is done to us and cleaning the guano is of no concern" – VRC Caretaker

Contributions to bat conservation and research in BC



The bats use the bottom of the railing. This provides ideal spacing for bats and is similar to a chamber found within a bat house.

The site offers excellent bat viewing in an urban centre. The clubhouse is on private property; however, its entrance is located off the seawall. From April through August, visitors to Stanley Park can enjoy watching bats emerge from their roost to feed over the water at sunset. Some club members also enjoy this acrobatic display each year.

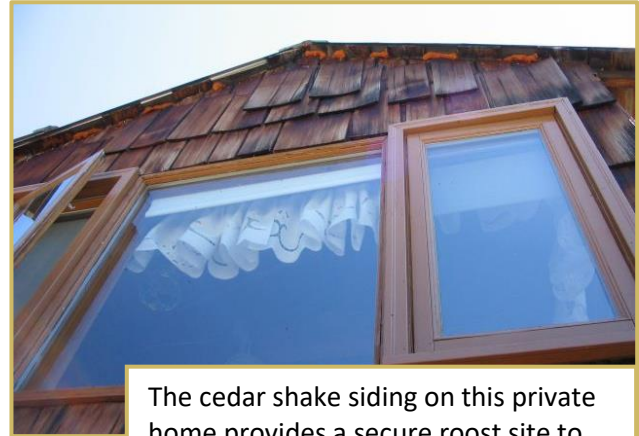
Volunteers for the Stanley Park Ecology Society noted the roost in 2016; informal monitoring was conducted on the roost in 2016 and 2017. It was included in the BC Annual Bat Count beginning in 2018. The Vancouver Rowing Club will continue to work with the BC Community Bat Program to provide access to the building for future counts.

Living with Bats under Wooden Shakes

Location: Private home, Hope
Colony size: 200
Species: Little Brown Myotis, Yuma Myotis

History

This private home and B&B has had bats occupying the wooden shake siding since shortly after the house was built by the landowner, in the mid 1980s. The discovery of two dead bats prompted the landowner to contact the BC Community Bat Program in 2015.



The cedar shake siding on this private home provides a secure roost site to approximately 200 bats.

The landowner has observed the bats for years, and has noticed that the timing when they return to the roost and the apparent colony size varied annually. Sometimes bats did not appear to show up until as late as June. The landowner, who has a commercial organic garden, considers the bat colony as beneficial. Whenever possible, he takes the opportunity to educate guests at the B&B and visitors to the organic farm on the importance of bats in our ecosystem. The landowner and his guests participate in the BC Annual Bat Count.

Management actions

Guano accumulates on a balcony under the main colony location. The guano is removed annually and used as fertilizer in the organic garden. The landowner has solicited the help of his WWOOFers (World Wide Opportunities on Organic Farms) in the annual guano maintenance effort.

“The bat colony is an excellent learning opportunity and example of a holistic way of living with nature” - Homeowner

The door to the balcony adjacent to the roosting location is sealed shut during the maternity season, to prevent disturbance to the colony and any inadvertent bat-human contact.

To provide additional roosting options, the owner has installed two bat boxes on-site.

Contributions to bat conservation and research in BC

Monitoring of the colony provides important information about regional bat ecology, including spring arrival and end of season departure dates each year.

The landowner and his guests participate in the BC Annual Bat Count. The number of bats observed at this site during the counts can vary significantly within relatively short time periods (3-5 days). This is particularly pronounced once juveniles have started to fly, and during significant changes in the weather. This variation — with the bats apparently disappearing and then returning — suggests that the colony is using one or more nearby alternate roosts. This may provide an opportunity to study roost switching behaviour.

Living with Bats in Soffits and Bat Boxes

Location: Private home, Saanich
Colony size: 550
Species: Yuma Myotis, Little Brown Myotis



History

The owners moved into this rural Saanich home in 1970. About 10 years later, a storm knocked down an empty barn and they began to notice bats using the soffits on their house. In 2014, after counting more than 300 bats emerge from their house on a summer evening, they decided to accept Habitat Acquisition Trust's offer of bat boxes. One was installed on the house and another was installed in the garden.

Bats began using the boxes almost immediately, but did not abandon the soffits. The owners feel honoured that the bat population has now increased to over 550!

"It's fun to see the bats swooping over the pond at dusk, but the mornings are even better. Some of our visitors set an alarm in order to watch them return. I love to see them circle and fly in under the flashing - we feel special and proud that they have chosen us" - Homeowner

Management actions

"The bats do not harm us in any way. Their presence helps us feel like we are part of the ecosystem. They fuel our curiosity about the natural world." - Homeowner

The owners enjoy the bats so much that the minor irritations are easy to overlook. They've become vigilant about keeping doors and windows closed on summer evenings, to prevent bats from entering their house. If a bat does enter - as mainly happens when they have visitors - they've found ways to help. If the bat happens to land on a plant, they carry the plant outside.

If in a curtain, they open the window and carefully let the curtain fall outside. When the bat is difficult to find, they purposefully leave the door open at dusk and do their best to shoo the bat out.

They haven't been bothered by guano because most of it falls directly into the garden, but bat urine does streak and stain the windows. Their practical approach is to wait until the end of the summer before washing the windows.

The bats use the soffit areas only, which are isolated from the rest of the building

When they needed to redo their roof, the owners waited until after the bats had left at the end of the summer so they wouldn't risk harming them.

Contributions to bat conservation and research in BC

The owners find it fascinating to observe how the bats may switch roost sites and move around their property. They can tell where the majority of bats are roosting by the amount of urine staining a window. The most impacted windows vary from year to year, as do numbers in the bat boxes. Eventually, we may learn more about bat ecology by more closely monitoring the temperature and other factors that may influence the bats' choices.

Living with Bats –cost estimates for associated activities

Category	Activity	Cost estimate		Notes
		Minimum	Maximum	
Habitat enhancement	Bat House Purchase	Free (if available from a local bat program - e.g., Habitat Acquisition Trust (Victoria), Okanagan Community Bat Project)	\$ 60 - 400 (Non-profit wildlife organizations or online purchase. Cost varies with size/model) ¹ \$130 from HAT (if you can pick it up)	Contact BC Community Bat Program for information on availability and requirements.
	Bat House Installation	Free (if available from a local bat program - e.g., Okanagan Community Bat Program)	Posts and concrete for base may be \$200 +	Consider location – installation on the side of building costs less and may be more effective than on a post.
Modifications	Sealing access points into human living space	Minimal (e.g. tube of caulking)	Can be very expensive at some sites with many exits (e.g., old log cabins)	Can be done any time of year. Ensure bats have access to outside of roost to avoid entrapment.
	Ensure roost space is bat-friendly	Minimal – remove hazards		
	Noise reduction	Minimal – insulation can be used and has other benefits	Soundproofing is costly; partial exclusion may be more affordable	Consider roost location and assess options and effectiveness carefully prior to beginning soundproofing.
	Smell reduction – contain guano and urine	Minimal	Costly if soiled insulation must be removed/replaced	Requires plastic/tarps/ plywood, human resources. Work only in timing windows (when bats are absent) for any modifications to the roost area.

¹ Be cautious of commercially sold bat houses - many are poorly designed for long-term bat use. Visit our website for a list of effective bat houses and bat house retailers in your region.

Living with Bats –cost estimates for associated activities

Maintenance	Cleaning windows and sidings	Minimal		Needs human resources. May be as simple as spraying with a hose.
	Cleaning up guano inside an attic	Minimal if surface is prepped (e.g. plywood, tarp)	\$1000 annually for large roost, if contracted	Cost to prep surface depends on area to cover. Needs human resources. Consider ease of access. Work only in timing windows (when bats are absent).
Monitoring	Annual Bat Count	2- 4 hours in summer Tally counters \$5- \$15 each		Often supported by BC Community Bat Program.
	Webcam / live feed	\$ 300	\$1000	Contact BC Community Bat Program for information on camera systems to ensure ultrasonic noise will not disturb bats
	Temperature monitoring	\$ 275	\$700	HOBO temperature loggers available online
	Bat activity monitoring	\$500 (handheld detector such as Wildlife Acoustics Echometer Touch)	\$650 (leave-in-place detector such as Titley Scientific's RoostLogger)	Bat detectors and batteries available online.
Education	Interpretive Centre	\$ 1100 – development of displays and materials, printing	\$3000+	Contact BC Community Bat Program for links to educational resources
	Bat House Trail and Signage	Free if kind-kind materials and labour can be found	\$ 2600 + volunteer effort (8 boxes and signs on posts in Peachland)	Contact BC Community Bat Program for resources