



& bats
BUILDINGS

CONTENTS

Contents



WHY YOU SHOULD CARE

page two

Dianne Odegard
Co-Founder
Austin Bat Refuge
www.austinbatrefuge.org

Laura Seckbach Finn
Founder / Director
Fly By Night, Inc.
Co-founder / Coordinator, BCI
Bats in Buildings Program, 2000-04
www.flybynightinc.org

Micaela Jemison
Director of Communication &
Public Engagement
Bat Conservation International
www.batcon.org

ACKNOWLEDGEMENTS:

Thanks to Logos Press and Fly By Night, Inc.: Finn LS and TG Finn. 2012. Bat Management: Excluding Bats from Man-Made Structures. Chapter 8 In: Barnard S. editor. Bats in Captivity, Volume 4: Legislation and Public Education. Wash. D.C. Logos Press. p 227 - 247. www.batsincaptivity.com.

Cover photos by Michael Durham (top left), J. Scott Altenbach (top right), and Donna Hensley (bottom right).

Inside flap photos by Jose Martinez, Dianne Odegard, MerlinTuttle.com, Michael Durham, and Brian Keeley, respectively.

Back cover photo by Michael Durham.



ROOSTING

page three



BATS IN THE INTERIOR

page five



WHERE DO BATS GET IN?

page six



LEAVE SAFELY!

page seven



AWARENESS & PREVENTION

page nine



Q&A

page ten

Bats are critical pollinators, pest controllers, and seed distributors. Their presence and activities benefit many aspects of humanity's existence



► Bats, like this Yuma myotis, (*Myotis yumanensis*) help farmers keep pests from destroying annual crop yields. Photo: MerlinTuttle.com

BATS ARE BENEFICIAL

Bats may be the most highly beneficial, yet misunderstood and maligned group of mammals on the planet. Bats are not only vital to natural ecosystems, they are valuable to our economy. Research has revealed that Mexican free-tailed bats in south-central Texas save farmers up to \$1.7 million per year due to their consumption of destructive agricultural pests. In addition to the economic benefits provided by bats, there is increasing scientific evidence that the health of bat populations may correlate with the health of the natural ecosystems in which they live.

WHY THEY'RE DECLINING

Bat populations have been declining worldwide as a result of habitat loss but also because of human persecution, largely a result of ignorance and misinformation.

! A more recent threat to bats is White-nose Syndrome, a fungal disease which has killed more than 6 million bats in the United States and Canada, since its discovery in 2006. Learn more about threats to bats [here](#).

WHERE BATS AND HUMANS CROSS PATHS

Many North American bat species can be found roosting in human-made structures, and most feed exclusively on insects, making them extremely beneficial for the natural pest control they provide.

! While bats roosting in buildings usually cause little more than an inconvenience to people, bats are at risk of injury or mortality as a result of structural changes that block or close off exterior penetrations. Such changes can inadvertently cause bats to become entrapped within their roost or cause the roost to overheat. This creates problems that can be costly for both bats and people, but prevention is easy. Follow the guidelines in this brochure, along with expanded information [online](#).



► A little brown myotis (*Myotis lucifugus*) shows signs of White-nose Syndrome on its chin, ear, and forearm. Photo: Michael Schirmacher/Bat Conservation International

& why? HOW



- ▶ Mother big brown bat (*Eptesicus fuscus*) and pups roosting in an attic. Photo: Donna Hensley
- ▶ Mexican free-tailed bats (*Tadarida brasiliensis*) commonly roost in buildings in the southern half of the U.S. Photo: MerlinTuttle.com

WHY DO SOME BATS ROOST IN BUILDINGS?

Buildings give bats what all mammals need: protection from predators, stable temperatures and safe shelter in which to rest and raise their young. Bats have species-specific roost needs and preferences that vary by season, region, climate and activity. Some bat species use man-made structures like buildings, bridges and other constructions, to complement their selection of natural roosts, whereas others are forced to use buildings almost exclusively as alternative roosts

when natural roosts such as caves and hollow trees are in decline or no longer available. In the U.S. and Canada, two-thirds of the 47 bat species have been documented in structures.

HOW DOES ROOSTING IN BUILDINGS MAKE BATS VULNERABLE?

Bat populations are limited by the availability of suitable roosting habitat. The adaptation to roosting in man-made structures is a survival strategy that may have initially allowed several bat species to expand their range, but that

strategy has backfired. Colonies in buildings can be conspicuous. Fear, guano accumulation, staining, odor and noise are the primary reasons bats in buildings are unwelcome. Further, phobias, myths and exaggerated reports of disease are often perpetuated by the media and by some uninformed professionals who portray bats as dangerous pests that require immediate removal. These issues, compounded by an abundance of misleading and conflicting information, leave most colonies in structures vulnerable to destruction and roost loss.



- ▶ Staining, musky odors, and audible roost chatter are all clues that suggest bats might be occupying a structural void. *Photo: Brian Keeley*
- ▶ Pallid bats (*Antrozous pallidus*) are usually found in rocky, mountainous areas. When their habitats are disturbed, they may seek shelter in exterior structures. *Photo: Bruce D. Taubert*



RECOGNIZE THE SIGNS OF ROOSTING BATS

It is usually not necessary to enter an attic, basement or other areas to look for bats roosting in structural voids (the spaces between exterior and interior envelopes of a building). Evidence can include seeing them entering or exiting a roost, staining and guano accumulations near active roost entries, audible roost chatter (high-pitched chirping), a distinct musky odor, or repeatedly finding bats on the ground or roosting on an exterior wall.

❗ The size and shape of bat guano differs among bat species, but all insect-eating bat droppings contain shiny insect parts and have a dry, crumbly texture. Bat guano can sometimes be confused with gecko, lizard, frog or rodent droppings, but it's easy to tell the difference. If the pellets are hard or contain any white material, it is NOT bat guano. Learn more [online](#).



- ▶ Bat guano crumbles easily. *Photo: Dianne Odegard*

& prevent PROTECT

WHO LET THE BAT IN?

Bats found inside living or working spaces are usually there by accident and a single bat flying inside does not necessarily indicate that a colony is in residence. Occasionally, a bat may fly through an open door or window, or be carried in by a pet. These accidental visitors can be prevented by keeping doors



► A bat that has accidentally entered your home wants nothing more than to safely leave. *Photo: Lee Mackenzie*

and windows screened, chimneys capped, and exterior entry, basement or attic doors closed and in good repair.

Bats that live in buildings usually roost in structural voids, the spaces between the exterior and interior envelopes of a building. Bats enter voids through penetrations (openings) on the exterior of buildings. A colony may remain unnoticed unless someone sees, hears or smells them. When a resident colony is present in the structure, lost bats may find their way into the living area once or twice a year. These events are usually rare, but may occur during the summer maternity season (lost juveniles), or when a bat awakens briefly from winter hibernation.

PREVENTING BAT ACCESS INTO THE LIVING SPACE

Interior access can be prevented without disturbing a resident

colony. Close off interior openings in walls, ceilings and floors, such as those around plumbing or gas pipes, electrical wiring, or heating and air conditioning units found in utility closets, cabinets, behind appliances, and under sinks. Ensuring an interior “bat-free zone” will prevent the stress (for bat and human) of the sudden appearance of a bat in the home or workplace, and allows any further management actions to be carefully considered and planned.

❗ Although interior openings can be closed to prevent bat access to the living space, closing exterior penetrations will prevent roosting bats from leaving and should never be done without a solid plan to prevent entrapment and related mortality.

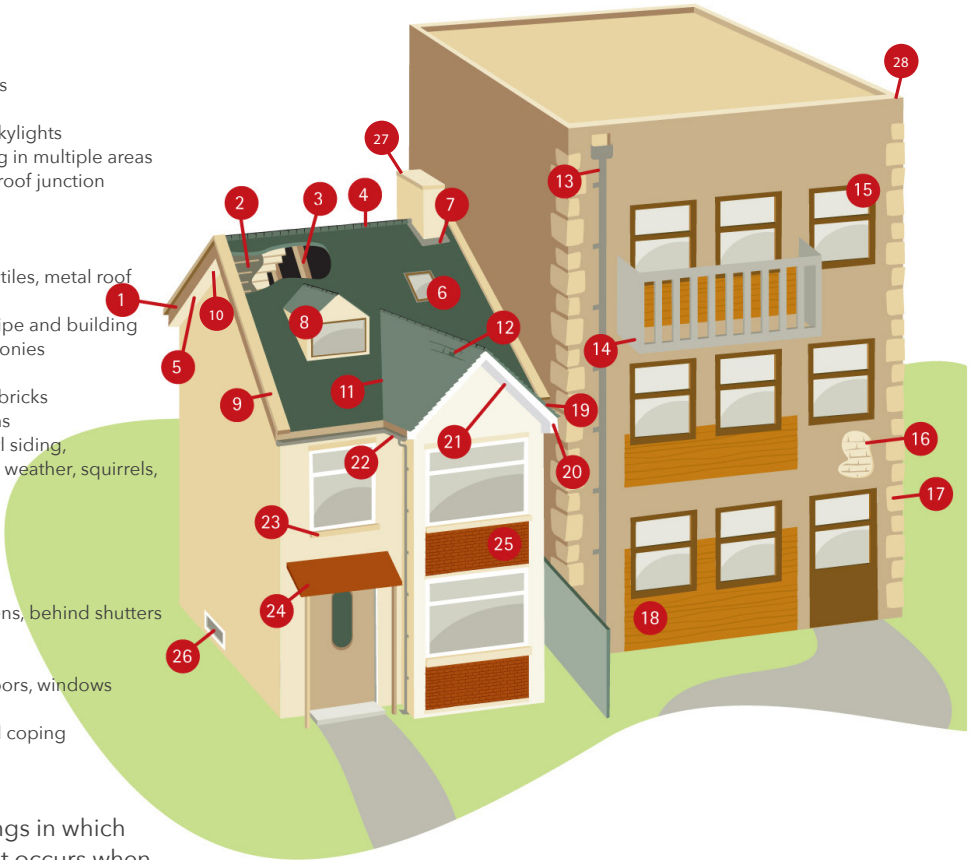
ENTRAPMENT

Bats are vulnerable to injury or mortality as a result of structural

DISPELLING THE MYTH: DO BATS CARRY RABIES?

- Bats do not “carry” rabies. The vast majority of bats do not become rabid and there is no evidence of epidemic outbreaks of bat rabies. When bats become infected with rabies, they die from the disease.
- Rabies can be spread if the virus (found in saliva and CNS tissue of infected mammals) enters the nervous system, usually through a bite from a rabid animal. It is NOT spread through contact with blood, urine or droppings.
- The potential health risk to humans from bats is low, and easily preventable through public education and a few simple precautions. Learn more about bats and human contact [online](#).

1. Barge board
2. Roofing felt
3. Rafters
4. Ridge tiles or ridge caps
5. Soffit
6. Attic and gable vents, skylights
7. Bent or ill-fitting flashing in multiple areas
8. Dormer window, soffit, roof junction
9. Coping stones
10. Gable vents
11. Valley
12. Loose shingles, broken tiles, metal roof closures
13. Space between downpipe and building
14. Metal elements on balconies
15. Sash window
16. Loose mortar between bricks
17. Corner boards or quoins
18. Damaged wood or vinyl siding, penetrations caused by weather, squirrels, woodpeckers, etc.
19. End tiles
20. Fascia board/eaves
21. Cornice
22. Behind gutters
23. Window sills, torn screens, behind shutters
24. Porch
25. Hanging tiles
26. Basement and cellar doors, windows
27. Chimney
28. Parapet walls and metal coping



changes to the buildings in which they roost. Entrapment occurs when an active exit is blocked, preventing bats from exiting their roost. This can result from an exclusion at the wrong time of year, from not allowing enough time for bats to exit a roost before final sealing, or an exit closed inadvertently during construction or maintenance.

! Because it occurs inside walls and other areas that are away from human view, flawed exclusion attempts or structural modifications that unintentionally seal bats in buildings can cause significant mortality.

Though evidence of entrapment may include numerous bats found in the living space of a building, most entrapped bats die of dehydration and starvation. Strong putrid odors and dark moist stains on walls or ceilings (caused

► The above graphic shows areas where bats might enter or roost. *Graphic courtesy of Bat Conservation Trust, www.bats.org.uk*

by seepage from decomposing bats) are often misidentified as water leaks, mold, rust or a dead raccoon / squirrel. **Because mortality is often not recognized, it is rarely documented, and nearly impossible to accurately quantify.**

WHERE BATS CAN ENTER

Potential access areas for bats include structural penetrations as small as 5/16" (8mm) x 1 1/2" (38 mm) or holes 5/8" (16mm) x 7/8" (22 mm), which can include expansion joints, holes, cracks or crevices on the exterior of a structure. **As a general rule, if you can get your pinky finger in, a bat can enter.**



► Bats can enter through eaves or attic / gable vents, or under loose shingles. Notice exclusion tubes in place. *Credit: Lee Mackenzie*

07. LEAVE SAFELY!

& fly away

BE FREE



IF A BAT GETS INSIDE MY HOME, HOW CAN I GET IT OUT?

A single bat flying in the house is rarely cause for alarm and can usually be dealt with easily. In most cases, the "lost" bat is trying frantically to locate an exit and will leave on its own, though leaving may be more challenging for the bat than getting in! The animal can be assisted by opening a window or exterior door. Doors to adjacent rooms should be closed, all lights should be turned ON and ceiling fans turned OFF. It is important to remain quiet and patient as the

bat finds its way outside. If the bat does not leave on its own, **and if no direct contact with people or pets that may have resulted in a bite has occurred**, the bat can be safely captured and released outside.

❗ Please note: A bat that has bitten someone **MUST** be tested for rabies and should **NOT** be released. If there is a chance that a person or pet was bitten, contain the bat and call your local Animal Control Agency. Then consult with your doctor or your state or local health department. A bite from

► Pallid bats (*Antrozous pallidus*) use open porches, patios, or garages as temporary night roosts for feeding or social activity. *Photo: MerlinTuttle.com*

any wild or unfamiliar mammal, including dogs and cats, should always be taken seriously. If the rabies status of the offending animal cannot be confirmed as negative, post-exposure rabies vaccinations may be necessary.

Don't panic! Bats do not attack. A bat found flying in your home is desperate to find an exit and is more afraid of you than you are of the bat.

NEVER ATTEMPT TO CAPTURE A BAT WITH BARE HANDS

Follow these steps to capture a bat for release or for testing:

1. There is no need to chase a bat; simply wait quietly until the bat lands, then, wearing leather gloves, cover it with a small box or other container.
2. Gently, slip a piece of cardboard or a large envelope between the container and the surface where the bat has landed. Be careful that no part of the bat is caught between the container and the cardboard. Then slowly turn the box over, containing the bat inside.
3. Place the covered container in a quiet, safe place and wait until dark before releasing the bat outdoors (a bat released during the day is vulnerable to predators).
 - ❗ If the bat must remain in the box for several hours (e.g., it's daytime and you want to wait until dark to release) place a soft cloth (non-terry) in the box before securing a cover. Most bats are very small, and can escape from a container with a loose-fitting lid, so be sure your cover is secure, but not air-tight. Small holes can be made for ventilation.
4. Most bats need to drop into flight from an elevated location, so



► Use a container and a piece of cardboard to contain a lost bat, either for release or for testing.
Photo: Fly By Night, Inc.

don't place the container on the ground. Place it on its side so the bat can easily climb out onto a tree limb or a second story deck, etc.

5. Watch until the bat flies away.
6. If the bat appears unable to fly, contact a local bat rehabilitator. You can search for one by state [here](#) or contact your state wildlife agency or Department of Natural Resources.

DISPELLING THE MYTH: ARE BATS FLYING MICE?

- Bats are members of the mammalian order Chiroptera (a Greek word meaning "hand-wing"). Although they are often described as "flying mice," bats are not closely related to rodents.
- Bats are the only mammals capable of true flight.
- Unlike rodents, bats are long-lived (the record is 41 years), reproduce slowly (most have one pup per year), and most species have tiny sharp teeth designed for feeding on insects; they are incapable of destructive chewing or gnawing.

& care BE AWARE

Finding a way to live in harmony with nature is always our first priority. So, if we need bats to move, careful planning is essential.

EXCLUSION: IS IT NECESSARY?

Bats are not destructive. They do not build nests, chew or gnaw building materials, and any ectoparasites associated with bats rarely bite humans. People sometimes live within meters of active bat colonies for years, completely unaware of their presence. **There may be little reason** to exclude bats from out-of-the-way areas where there is little risk of conflict.

WHEN BAT EXCLUSION SHOULD NOT BE PERFORMED

Bat exclusion should NEVER be performed at night, or during any period when bats may not leave their roost on a regular nightly basis. This includes during maternity season in the summer, during hibernation or torpor (a less lengthy period of inactivity) in winter and during periods of inclement weather. **Maternity season dates vary by region and are species-specific; though not typical, some tropical and**



► Bird netting should NEVER be used as an exclusion device. *Photo: Fly By Night, Inc.*

subtropical species in southern regions may give birth twice a year.

METHODS TO AVOID

An abundance of outdated, conflicting and misleading information about bat exclusion endangers bats. Exclusion methods historically considered reliable, like flexible netting and duct tape, frequently result in bats becoming entangled or trapped. Some methods are illegal in the U.S. (federal law prohibits the use of any poison, fumigant or repellent for any purpose not specifically stated on the label). Other methods are ineffective and may be dangerous to both bats and people (mothballs). Learn more [online](#).

SHOULD I HIRE A PROFESSIONAL OR EXCLUDE THE BATS MYSELF?

Safely and permanently excluding bats from structures requires patience and attention to detail, and can involve working high on ladders, scaffolding or even a hydraulic lift. Though detailed exclusion instructions can be found [online](#), many prefer to contact a bat management professional. Bat Conservation International no longer maintains a list of BCI-approved bat exclusion professionals, but we do provide criteria for selecting a qualified professional.

QUESTION: Which North American bat species are known to roost in buildings?

ANSWER: Two-thirds of the bat species in North America are documented roosting in buildings. To learn which ones, [visit online.](#)

QUESTION: What about bats that roost on my porch at night?

ANSWER: Some species such as pallid bats (*Antrozous pallidus*) use open porches, patios, or garages as temporary night roosts for feeding or social activity. Bats are usually absent from these sites during the day, and insect parts or guano may be the only evidence that bats were roosting the night before. These night roosting bats can be discouraged if you make their roosting area 'less comfortable' by adding clutter or making roosting surfaces difficult to hang on. See how at [here.](#)

QUESTION: If I install a bat house, will the bats move into it AND leave my house?

ANSWER: Bat houses are excellent management tools that can provide displaced bats with a safe alternate roost away from structures where they are unwelcome. And while it is true that "bats in a bat house are not in YOUR house," bats are faithful to their homes, and very rarely voluntarily leave an active roost for a bat house. The result



► Bats, like this evening bat (*Nycticeius humeralis*), are not destructive. Photo: J. Scott Altenbach

of the most well-planned and safest bat exclusion is habitat loss and displacement for bats. For that reason, when an exclusion is planned, BCI recommends installing one or more bat houses nearby, well in advance. Learn more at [online.](#)

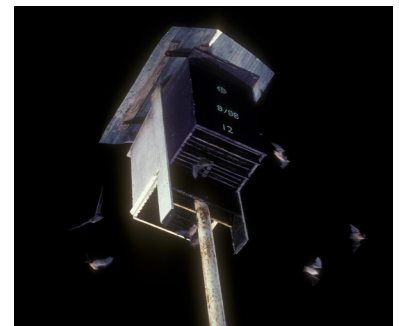
QUESTION: How can I get bats to leave and not come back?

ANSWER: When bats roosting in a structure are unwelcome, exclusion is the only permanent solution. The objective should be to get all bats safely out of a building and to keep them out permanently. Although projects can vary in scale depending on structure type, species present and roost location, the process is the same regardless of the number of bats or how long they've been there. A complete description of the bat exclusion

process can be found [online.](#)

QUESTION: What if you WANT bats in your structure?

ANSWER: Occasionally, people want to increase the numbers of bats in a building. Often these are abandoned buildings used for interpretive purposes, structures housing endangered or threatened species, or buildings owned by people who simply realize that the benefits of bat residents can outweigh drawbacks. To learn more, see our Bat House Research Project newsletter archives [online](#) for ways to accommodate more bats, while minimizing problems from guano or noise.



► Bat houses can provide excellent homes for displaced bats. More importantly, they help keep bats away from man-made structures. Photo: MerlinTuttle.com

MORE INFO
ONLINE AT
batcon.org

Q & A



Do you want
to give bats
the future they
deserve?

! SUPPORT BCI

If you'd like to support BCI's mission of bat conservation, please consider becoming a sustaining monthly, or annual member by visiting our [website](#).

Memberships include:

- Our award-winning BATS magazine three times a year
- Invitations to special events
- The knowledge that your gift is helping to protect bat species around the world

&thanks
FOR SUPPORTING BCI