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BATS

BATS ARE ONE OF a few animals, including wolves, whose public image has turned from highly negative to mostly positive in recent times. These diminutive creatures once inspired such universal dread that many thousands were killed indiscriminately each year. The change is due, in large part, to individuals and organizations that raise awareness of the bat's ecological role and counter myths about their potential harm. Individuals can make a very real difference for animal welfare. Thanks to those who champion bats, we now know they rarely cause problems for humans and frequently are valuable in controlling insects regarded as pests.

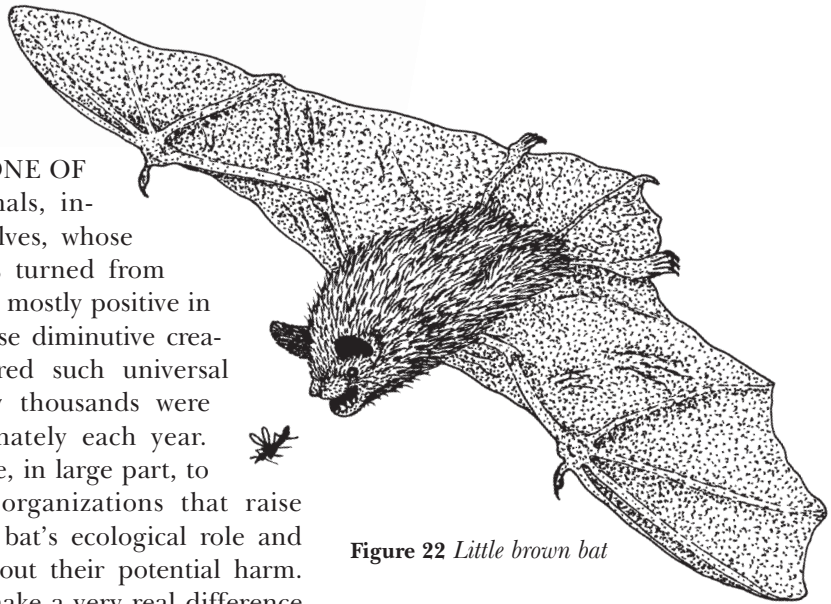


Figure 22 *Little brown bat*

Classification and Range

All bats belong to the order *Chiroptera*, the only group of mammals that is truly capable of flight. There are 17 families of bats that contain 925 species worldwide, with 45 species occurring in four families found throughout North America. Most people are not able to distinguish one species of bat from another in the air. However, a bat is not just a

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- ◆ The little brown bat can consume up to sixty mosquitoes in an hour as it zips through the night air to feed.
 - ◆ In flight, little brown bats use their echolocation capabilities to detect and avoid objects as thin as a hair.
 - ◆ A fat bat? Like chipmunks and woodchucks, bats store fat in preparation for their hibernation.
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bat. Some are solitary, some live in groups. Some roost in houses at times, others never will. Only a few species ever come into conflict with humans at all. These may include the wide-ranging little brown bat and related western species (*Myotis spp.*), the big brown bat (*Eptesicus fuscus*), the evening bat (*Nycticeius humeralis*), the pallid bat (*Antrozous pallidus*), the big-eared bat (*Corynorhinus spp.*), the free-tailed bat (*Tadarida brasiliensis*), the mastiff bat (*Eumops and Molossus spp.*), and the pipistrelle (*Pipistrellus spp.*).

Many other species may occur locally. Local libraries often offer mammal field guides and other publications that show the amazing diversity and variety of this group of animals. National and local bat conservation organizations are also excellent sources of information.

Habits

All North American bats are nocturnal, although they may be quite visible at dusk when they begin foraging. Bat species tend to have specific habitat requirements for their daytime refuges. For example, big brown bats prefer that nursery colony temperatures not exceed 90 degrees Fahrenheit (F), while little brown bats prefer temperatures in the 90–110 degree F range, and some other bats tolerate temperatures up to 120 degrees F.

Bats in temperate areas migrate or hibernate, while tropical bats, sometimes of the same species as temperate migrants, may remain active in the same area all year. Most migrants travel only a few hundred miles, but a few species migrate longer distances. Both the summer colonial and solitary species collect in groups, often in caves, mines, buildings, or other hibernation sites (called hibernacula), and spend the winter in a state of torpor. Hibernating bats may wake periodically throughout the winter, but being fully aroused can be dangerous to them, as it can use up a very large proportion of their stored energy. For that reason, human disturbance of hibernating bats must be minimized or avoided altogether.

Nearly all North American bats feed on insects, which they usually catch in flight. They detect their prey by echolocation, which is the remarkable ability to emit high-frequency sounds (outside of human hearing) to discern objects by the sound reflected back to the bat, much like sonar on a ship. This sense is so acute that some species can detect objects in flight no wider than a human hair. Different species specialize in eating different insects, but as a group, all bats are regarded as beneficial because of the many insects they consume.

Depending on latitude and local climate, most species give birth to a single young (or occasionally twins) in late spring, usually beginning in early May, although late April births do occur. The young of some species are able to fly after only three weeks or a month. Most young begin foraging with their mothers sometime in July, but they may not be independent until the end of the summer. The newborn of some species cling to the mother while she hunts, but all offspring are left behind as they grow too large to be carried. Bats often use attics as nurseries, because they

Bats and Bedrooms

The National Centers for Disease Control and Prevention (CDC) recommends people capture, if possible, any bat discovered in a room in which a person was sleeping. The bat should then be submitted to local or state health authorities for rabies testing, which means she will be killed. CDC recommends this precaution because, in a handful of rabies cases from bat-associated strains, the patient did not report an animal bite, leading to the suspicion that adults may overlook, or children may underreport, bat bites. As we advise with any situation involving potential exposure to rabies, consult your physician and local health authorities immediately.



Figure 23 Bat droppings are tiny, hard, and appear shiny most of the time due to the insect diet on which bats live.

maintain desired temperatures for raising young. Nursery colonies only contain breeding females and their young; the adult males and nonbreeding females roost elsewhere.

Public Health Concerns

Two infrequently encountered species, the silver-haired bat (*Lasionycteris noctivagans*) and eastern pipistrelle (*Pipistrellus subflavus*), are associated with a strain of rabies that has caused human deaths. The incidence of this disease in bat populations is extremely low, however, and rabid bats generally do not become aggressive and do not bite without provocation, although any bat may bite in self-defense. Most of the extremely rare confirmed human rabies exposure from bats happened when people accidentally or carelessly handled bats—for example, picking up a bat with bare hands or taking a bat from a pet's mouth. If a bat must be handled for any reason, leather work gloves offer protection from their small teeth. Large accumulations of bat droppings may harbor histoplasmosis fungi spores, which can be a public health concern.

Problems

Bats rely on existing openings to enter buildings rather than making or enlarging entry holes. Small (half-inch or greater) openings or narrow (quarter-inch-wide) gaps high on

houses, around chimneys, at the union of dormers with roofs, or at loose siding can all provide access. Bats may also enter under loose-fitting doors, around windows, and through gaps around conduits and utility vents. Bats roosting in houses can go unnoticed for years until accumulated feces and urine leach through attic spaces to stain the wall or ceiling on the living area below (Figure 23). Then homeowners often feel they have an immediate crisis, when, in fact, they have been living with the bats for years.

An individual bat may become an accidental intruder in a home, raising a different type of problem. Often the bat is first observed flying around a room early in the evening, landing on curtains or furniture and then taking flight again. In this case, getting the bat out of the house becomes a high priority.

Occasionally, a bat or a small group of bats hanging from a porch ceiling or under the eaves will surprise people coming home after dark. In such cases, the bats are simply resting between feeding flights and have probably chosen this location because it is close to their food—insects attracted by outdoor lights.

Solutions

Tolerance

Bat flying at dusk above the yard are absolutely no cause for alarm. This is perfectly natural—the bats are foraging for flying insects. Even encounters with bats temporarily trapped inside a house or discovered in an attic should not lead to hasty or panicked responses. Trapped bats can be removed and attic colonies excluded in a humane and effective manner that will minimize stress on both humans and bats.

Accidental Encounters

Any direct encounter with a bat inside or outside is accidental on the bat's part. These animals always try to avoid contact with humans and their pets if they can. The myth of bats

becoming entangled in one's hair is exactly that—a myth. Bats found outside may be ill, may be temporarily stunned from flying into a window, or, in colder weather, may simply be torpid and unable to move or fly as well as they can when warmed. Bats accidentally intruding in a home require essentially the same responses as bats outdoors, except that the bat needs help in getting out.

In any encounter with a bat, remain calm and keep pets and children away. For bats outdoors, this is usually the only action that is necessary. If the bat is inside, he will probably try to fly to an opening. Because of the confined space, however, he will have to fly in a U-shaped path, gaining altitude near the walls and losing altitude in the center of the room. A person standing in the middle of the room may feel attacked when the bat is only trying to stay airborne. Stay near a wall.

Close interior doors and give the bat an exit by opening an outside door or window. If the bat disappears before you provide an exit, he probably has landed somewhere he can hang—behind curtains or upholstered furniture, on hanging clothes or in house plants (Figure 24). Search and try to capture him in a net, such as a butterfly net, if one is available. If a net is not available and the bat is hanging on a vertical surface, carefully place a glass jar or plastic tub over him (metal cans can quickly cool bats to unsafe temperatures) and gently work a piece of cardboard or stiff paper between the container and the surface of the wall, trapping the bat inside.

A thick towel is a good way to capture a bat on the floor. Roll the bat up gently, take the towel outside away from bystanders and domestic animals, and unroll it. Leather (not cotton) work gloves are adequate protection from a bat's teeth and will allow a person to pick the animal up safely. *Never try to handle a bat with bare hands.* Be prepared for the bat to vocalize loudly in protest when picked up. Release the bat as soon as possible in a place where he will be out of harm's way if he does not fly immediately. Some bats can take off from the ground, but many can't, and allowing any released bat to climb a tree trunk or



Figure 24 *Little brown bat*

other vertical surface is a good idea.

After freeing the bat, find out how he entered the house. If an open window or door can be ruled out, then the bat may have been roosting somewhere within the outer walls of the house and accidentally found a route into the living space. Common entry points include gaps around window air conditioners, chimneys, and openings in interior walls that lead to attics or cellars that may harbor more bats. Inspect thoroughly and seal potential interior entrances.

Exclusion

In houses bats are most likely to colonize attics. The key to excluding a bat colony is to find all openings the bats are using. Sometimes, a well-used opening is discolored on the outside from the body oils that rub off as the bats come and go. Because discoloration is not always observed, a “bat watch” at dusk can reveal entrances. Watch closely from before sunset until at least thirty minutes after; it only takes a second or so for a bat to exit and take flight.

The best strategy for excluding a bat colony from a building is to allow the bats to leave on their own and then to deny them

reentry. Evict bats only when no dependent young are present. From late April through August is *not* a good time to try to solve bat colony problems, and many states now have laws specifically prohibiting exclusion at these times. After bats leave for the winter hibernacula, exclusion can be done in a more careful and deliberate manner, but be aware that some bats (such as the big brown bat) may overwinter in human structures and exclusion would trap them inside. In this case, the recommended approach is to use the check valve system described below after deciduous plants leaf out and when insects become abundant, but before births occur.

If you must exclude a bat colony, locate and note all outside entrances during bat watches. Do not simply seal up all openings at night. Not all the bats leave at the same time, nor do all leave every night, and you will likely trap some inside. Install one-way bat check valves on all entrances you find. If you are certain that all areas the bats are using are connected, you can seal some entrances and install check valves on the main one or few (Figure 25).

There are two main types of check valves for excluding bats. The Hanks excluder mounts over an exit hole and funnels bats out of the structure but does not allow them back in. The check valve system designed by Steve Frantz, of the New York State Department of Health, uses netting to exclude bats from reentry. Netting is draped over the opening bats are using to gain entry to a building, forcing them to move down the wall of the structure before they can fly free of it. Lightweight, flexible netting with 1/6-inch or smaller mesh is attached, usually with staples, to the structure, with the bottom open for exit and extending at least one to two feet below the entrance. Because bats use tactile (airflow) cues and possibly smell to locate exit/entry holes on return, these systems prevent them from regaining access. Left in place for at least five to seven days, these devices give all bats a chance to leave.

For buildings with rough exterior walls (such as brick or stone) and for holes at corners and in horizontal surfaces, the Hanks

excluder works well. Tubes with lightweight plastic sleeves that collapse prevent bats from returning once they crawl out. To make one of these devices, tape lightweight plastic securely around the end of a PVC pipe or flexible plastic tubing that is two inches in diameter and about a foot long. The pipe or tubing end of the check valve can be squeezed into narrow crevices or cut into flaps that can be opened up and attached securely to the structure with staples, nails, or strong tape.

After excluding, you should check the attic carefully to be sure there are no bats left and watch the outside of the house in the evening again to make sure the bats have not found another way in. If they have, add a check valve to the new entrance. After you are sure the bats are gone, remove the check valves and seal the entrances with appropriate building materials (hardware cloth, netting, or sheet metal).

Bat Houses

For bat conservation, and because it is something of a fad, many people put up bat houses in their yards. Bat house design, placement, and other factors strongly influence whether bats use a house. In recent surveys that included all types of house design and placement, bats used about 60 percent of bat

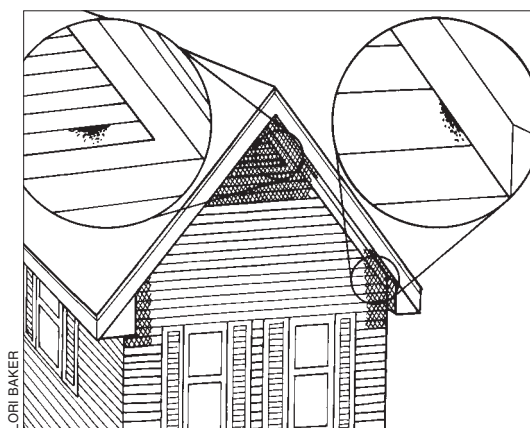


Figure 25 Bat check valves can be installed at appropriate times of the year over the entry/exit holes bats use to enter and leave buildings. The bats drop down and leave, but on returning cannot regain access.

houses. Bats are more likely to use houses installed in groups and on buildings or poles rather than those on trees. Where you mount a bat house strongly influences the temperature inside the houses and, therefore, use by bats. If you must exclude bats from a building, consider putting up well-designed and appropriately mounted bat houses first. One small sample of bat houses installed when bats were excluded from buildings found that displaced bats inhabited more than 90 percent of them. Prefabricated bat houses, as well as simple plans for building them yourself, are available at many nature centers and retail outlets specializing in bird feeding and wildlife products, as well as from Bat Conservation International (BCI).

A Last Word

Dozens of other species of wildlife need to join the bat and the wolf as deserving of public respect and understanding. Taken one species at a time, it might be some while before the value of all of them is recognized, but by using an ecosystem approach, we may make more rapid progress toward accepting the positive value of all wild animals.

Resources

Merlin Tuttle's *America's Neighborhood Bats* (University of Texas, 2005) is a go-to resource for information and advice. The group Tuttle founded, BCI, is an excellent source of advice and information on everything from natural history to conflict resolution for bats. It is on the Web at www.batcon.org or reachable by phone at 512-327-9721.