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Animal Damage Control

Integrated Pest Management,
Cooperative Extension Service,
North Dakota State University, Fargo, North Dakota
in cooperation with
U.S. Department of Agriculture-APHIS Animal Damage Control

ADC-4

BATS

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Since the earliest days of western civilization, bats have been associated with evil. The very mention of bats conjures up Halloween images of witches, warlocks and vampires. The bat's reputation for evil and attacking people or getting tangled in hair is totally undeserved and has no basis in scientific fact. Healthy bats rarely if ever attack people, even when chased.

There are seven resident species of bats in North Dakota. Most roost in caves, hollow trees or other natural shelters. A few species will roost and raise their young in occupied buildings. The big brown bat (*Eptesicus fuscus*) and the little brown bat (*Myotis lucifugus*) commonly do this and are the bats most often encountered by homeowners.

The big brown bat is about 4 inches long and has a wing span of 12 to 14 inches but only weighs about ½ ounce. The body and wings are dark brown in color and the ears are black. The little brown bat is about 3 inches long with a wing span of 8-10 inches and weighs about ¼ ounce. The body and wings are chocolate brown in color.

Bats native to the U.S. are almost entirely beneficial to man. Practically all human/bat incidents occur when someone attempts to handle a bat.

Bats most often become a pest when they take up residence in a building. Bats squeaking and scratching in the walls and attic can be very annoying and sharpen the fear many people have of bats. Their urine and feces can stain walls and ceilings, creating strong objectionable odors and attracting insects and other bats.

Bats can and do carry rabies, but at a much lower frequency than skunks or raccoons. In 1984 there was only one rabid bat reported in North Dakota, compared to 100 rabid skunks. During the same year nationally, skunks accounted for 40 percent of all cases of rabies in wildlife, raccoons 35 percent and bats 20 percent. The vast majority of rabid bat cases came from California, Texas and states east of the Mississippi River.

Biology and Behavior

Bats belong to the order of mammals called Chiroptera, meaning "hand-wing," and are the only mammal capable of true flight (Figure 1). Bats use echolocation (sonar) to navigate around obstructions and capture their food.

Bats can be found almost anywhere there is available food, roosting cover and water. With exception of some of the leafnose bats, all bats found in the U.S. feed on spiders, insects and scorpions. Some of the leafnosed bats feed in part, if not totally, on pollen and nectar. Leafnosed bats do not occur in North Dakota.

Some bats feed on the ground, although most drink and capture their food on the wing. The little brown bat feeds on midges, mosquitoes, caddis flies, moths and beetles. The big brown bat feeds on somewhat larger insects including beetles and stinkbugs. It has been estimated that a bat will eat about 1,000 of these insect pests each night.

Bats are nocturnal. They will leave the roost sites about dusk, feed for an hour or so, rest, and feed again just before dawn. They are generally back in the roost by sunup or shortly thereafter. During the day, they will lapse into an almost coma-like state.

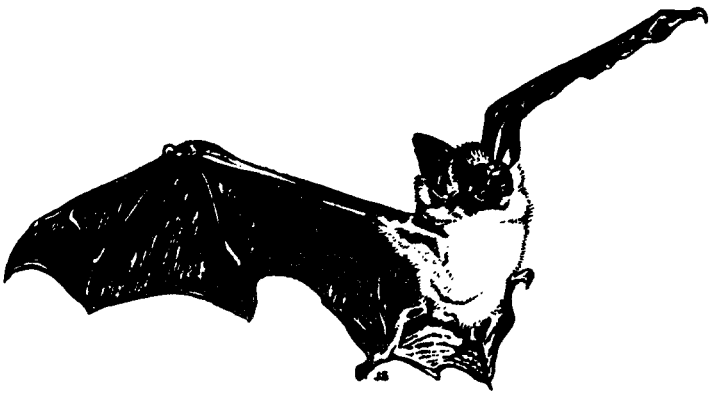

Figure 1. Bats are the only mammal capable of true flight.

In the summer both the big brown and little brown bats will form maternity colonies in buildings or other suitable locations. Maternity colonies of big brown bats are generally small, ranging from 10 to 200 individuals. Little brown bat colonies may contain as many as 2,000 individuals. These maternity colonies are composed almost entirely of females and their young. The males generally lead a solitary life throughout the summer.

The young are born during June and July. The little brown bat generally has a single baby and the big brown bat usually has two. Young bats are breast-fed until they are three to seven weeks old, when they are big enough to fly and capture their own food.

As the young are weaned, the number of males at the roost increases and mating occurs. The female stores the sperm in her uterus over the winter and actual conception does not take place until the following spring when she leaves her winter hibernation quarters.

By September or October, the maternity colonies will begin to break up and the bats move to their winter quarters. Little brown bats hibernate in colonies composed predominantly of males. Big brown bats are solitary hibernators.

The choice of hibernating sites seems to be determined by availability. Caves or abandoned mine shafts (Figure 2) are preferred, but buildings, hollow trees, rock crevices, or drain pipes are also used (Figure 3). One of the main criteria for a hibernating site is a constant, relatively warm temperature. In caves, little brown bats tend to move as deep into the cave as possible, while big brown bats tend to choose sites fairly close to the mouth of the cave. Bats will use the same maternity and hibernation site year after year, and often show a remarkable tenacity about such matters. If bats used a particular building this year, they will most likely use it next year.

Unlike other small mammals, bats are extremely long-lived. Banding records indicate that little brown bats may live 15 to 20 years and big brown bats as long as 9 years.

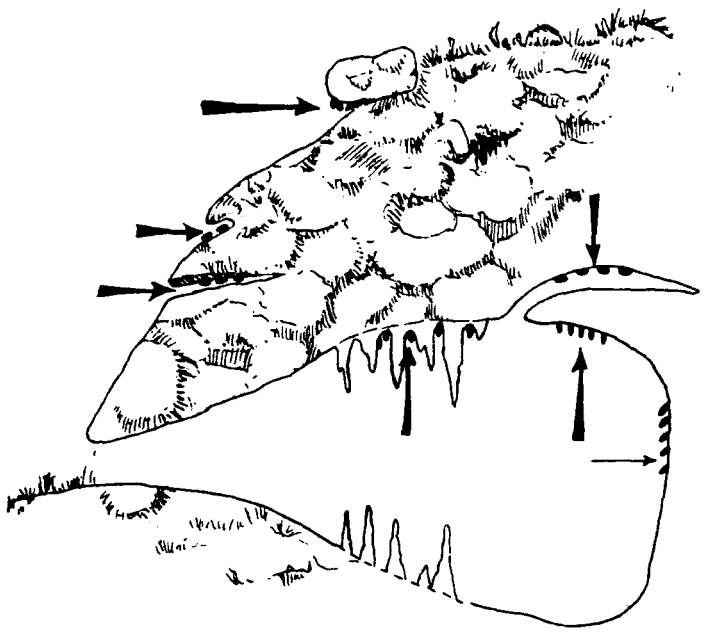

Figure 2. Possible roosting sites in a cave and under rocks.

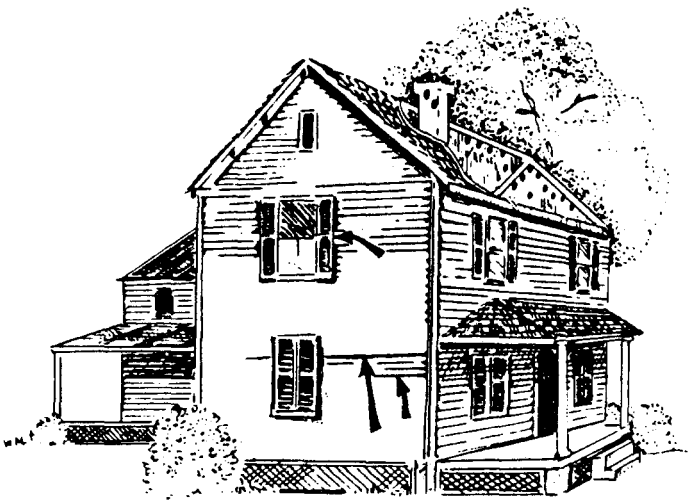

Figure 3. Possible roosting sites in a house.

Legal Status

Bats are not protected under North Dakota state law. The U.S. Fish and Wildlife Service has classified five species of native U.S. bats as endangered (gray bat, Hawaiian hoary bat, Indiana bat, Ozark big-eared bat and Virginia big-eared bat). None of these species occur in North Dakota.

Control

Inspecting for Bats

The first step in a bat control program is to make sure that the building is in fact infested with bats. Solitary bats will enter a building through an open window or door while searching for food. Bats will often be seen flying around a porch light or street light chasing the insects that are attracted to the light. Squeaking, scratching and thumping sounds heard in walls and attics may be caused by other pests such as rats or mice. Rustling and twittering sounds coming from an old chimney may be caused by chimney swifts.

A simple inspection of the outside of the building can be made to determine whether or not bats are living in it. Bats most commonly enter a building at the roof/wall joint, under loose fascia boards, broken attic vents or other cracks resulting from building deterioration. Bats can squeeze through an opening about 3/8 of an inch wide (Figure 4). There will often be dark greasy smudge marks on the wall just below the region where the bats are going in and out of the building.

The bat inspection should be started about ½ hour before dusk. Station enough people around the building so that the entire roof area can be kept under constant observation. If bats are present, they will start leaving the building about dusk; the last bat should be out of the build-

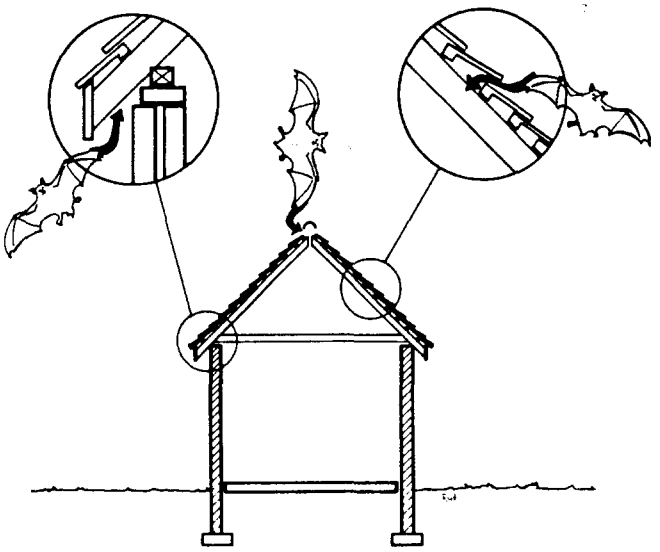

Figure 4. Bats enter under eaves, at badly fitting ridge, and under shingles, slates, tiles.

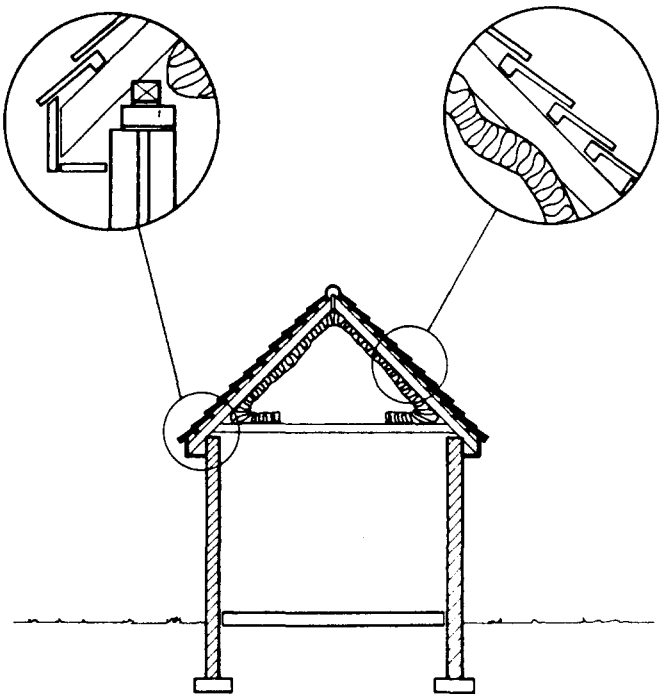

Figure 5. A properly insulated roof will keep bats out.

ing within one hour of the first bat. All bats exit/entrance points should be noted as well as the number of bats. This procedure should be done at least twice to make sure that all bat holes are identified and accurately determine the number of bats.

Exclusion

The objective of any bat control program is to permanently rid the building of bats. The only way of doing this is to bat-proof the building. Merely repelling bats may provide temporary relief but will not provide long term control.

Exclusion is best done in the late fall anytime after the bats have left and before they return in the early spring. If exclusion must be undertaken in the summer, it should not be done before mid-August. Exclusion carried out between mid-May and mid-August will result in young bats being trapped inside where they will die and create an odor problem.

If only one exit/entry hole is found in the course of the inspection, it can be plugged as soon as the last bat leaves the roost, hence the reason for counting the bats. If several holes are identified, all but one of them should be plugged during the daytime. Wait a day or two to give the bats a chance to get used to using the last opening, then plug it as soon as the last bat has left in the evening. If all holes can be safely plugged at night, then it is not necessary to wait the extra day or two.

Bats will not gnaw and claw their way into a building as rats and mice will. Therefore, almost anything can be used as a temporary seal - fiberglass insulation, rags, oakum, steel wool, etc. Permanent bat proofing requires the use of more permanent material - sheet metal, ¼ inch mesh hardware cloth or plastic netting, plywood, caulking compound or aerosol foam insulation (Figure 5). On large buildings or on those having a great many openings exclusion can be very expensive.

A solitary bat may occasionally enter a building, usually looking for food. When this happens, open the doors and windows so the bat can follow the air currents back outside. Do not try to chase the bat as this may cause the animal to hide. If the bat seems reluctant to leave, turn all the lights in the house off. If it still refuses to leave, it can be caught with a fish landing net or a large towel and released outside. Do not attempt to handle the bat barehanded. When handled, bats can and will bite!

Bats flying around outside of buildings or around pool areas can be discouraged by reducing or eliminating outdoor lighting. This should reduce the number of insects which in turn will make the area less attractive to the bats.

Bat Repellents

There may be times when, for various reasons, exclusion is not possible or the bats need to be forced out of a building before exclusion methods are used. Bat repelling methods can be successfully employed in these situations. As with exclusion, repelling should be limited to the late summer or early fall.

Naphthalene. Naphthalene (crystals or flakes) is the only chemical currently registered by the EPA as a bat repellent for indoor use. Naphthalene should be applied at the rate of 5 pounds per 2,000 cubic feet of attic or wall void space. As the material vaporizes, the bats will be repelled and will not return as long as the strong odor remains. Once the material dissipates the bats will return. Humans should avoid breathing the fumes and sensitive people or those with respiratory problems should avoid all treated areas.

High-Frequency Sound. High-frequency sound in the range of 4,000 to 18,000 cps has been used successfully to repel bats from gymnasiums, large warehouses, and

similar structions. Adjustable high frequency dog training whistles connected to cylinders of compressed air or large aquarium pumps and placed close to the bats' roost have a repelling effect on bats. It is believed that the high-frequency sound interferes with the bats ability to navigate. These whistles also make people in the area irritable and nervous.

Bright Lights. Bright lights strung through an occupied attic to illuminate all roosting sites may repel bats. The key to success with this method is to make sure that all roost sites are illuminated. Large attics may required several 100 to 150 watt bulbs. This method is cleaner than other methods and safer for both humans and bats.

Drafts. Drafts from carefully directed electric fans have successfully repelled bats.

Ultra High-Frequency Sounds. Despite the claims made by some manufacturers, ultrasonic devices do not appear to be effective against bats. The U.S. Fish and Wildlife and the EPA have tested a number of these devices. None of those tested were effective.

Toxicants

There are no toxicants available for the homeowner or commercial pest control operation for the control of bats.

In situations involving public health emergencies, the U.S. Public Health Service, Center for Disease Control, may approve the use of DDT against bats. However, almost all the bat control experts agree that the use of DDT or other pesticides to control bat colonies is perhaps the worst possible approach. These methods disperse the colony, cause lingering mortality, scatter dead and dying bats over a large area, and increase the chance for human contacts.

If further assistance with a bat problem is needed, contact the Extension Wildlife Specialist, Stevens Hall, NDSU, Fargo, ND 58105 or the USDA, APHIS, Animal Damage Control Office, 1500 Capitol Avenue, Bismarck, ND 58501.

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