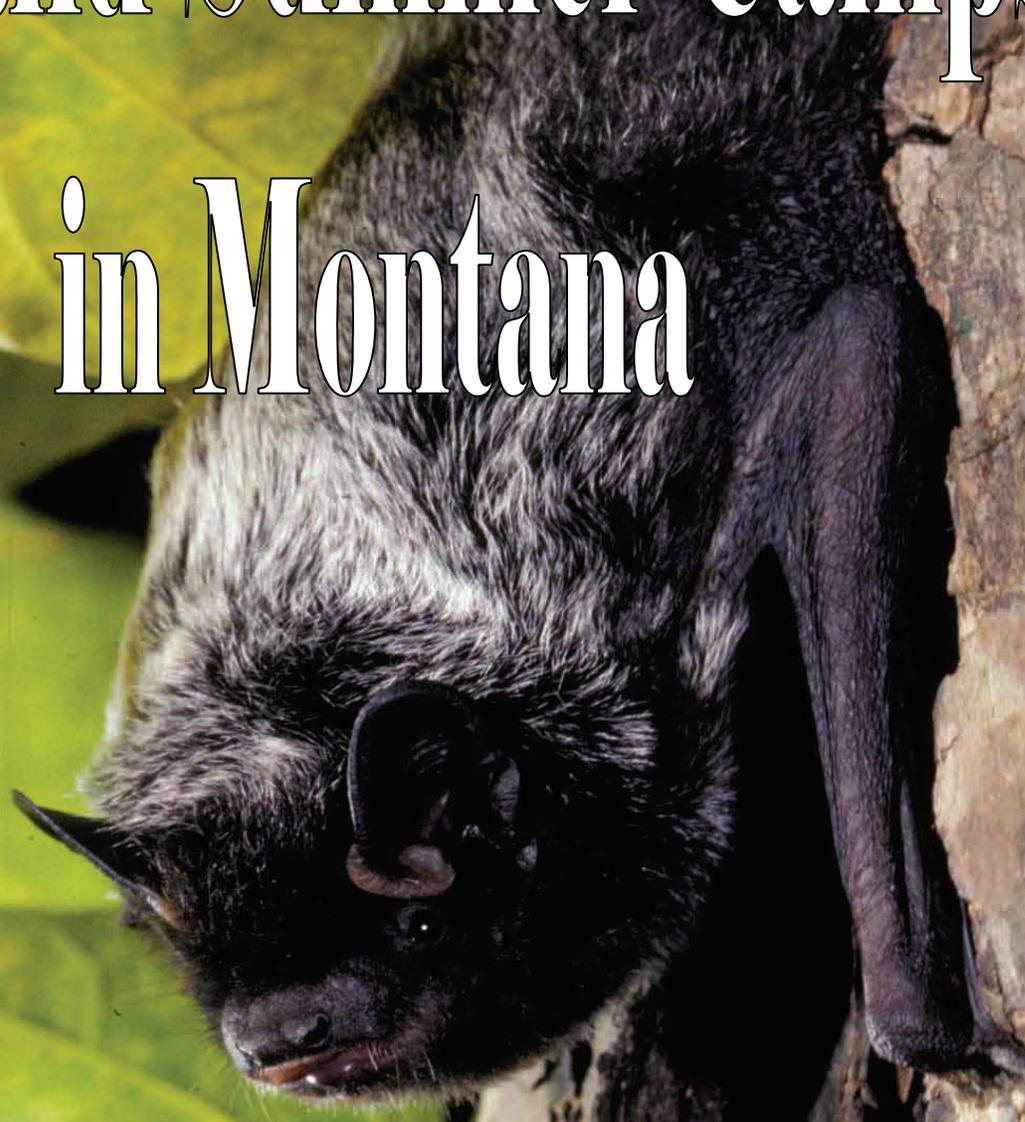


Bats and Summer Camps in Montana



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International

DPHHS 
MONTANA
Communicable Disease
Epidemiology Program

 **MONTANA**
Department of Public Health & Human Services

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PRESS RELEASE

Bats and Rabies

Summertime is bat season and a good time to remind everyone about bats and rabies. Although bats are very beneficial in controlling insect populations, they are known to be carriers of rabies in Montana.

Although, less than one percent of bats in nature carry the rabies virus, about ten percent of the bats tested at the Montana Department of Livestock's Veterinary Diagnostic Laboratory test positive for rabies each year.

In 2009 the Montana Department of Public Health and Human Services received close to 100 reports of encounters between bats and humans. Five of these bats that were submitted for testing were positive for rabies. The bats testing positive were from Cascade, Flathead, Mineral, Missoula, and Ravalli Counties. Any bat that is involved in a human encounter should be tested for rabies, if possible.

Rabies is a fatal disease that affects the nervous system of humans and other mammals. The rabies virus is carried in the saliva of infected animals and is usually transmitted to people and other animals when they are bitten or scratched by the rabid animal. Preventive treatment for persons potentially exposed to rabies is safe and effective in preventing rabies and must begin soon after exposure..

The Montana Department of Public Health and Human Services and the Department of Livestock remind everyone of the following rabies prevention tips:

- **Do not feed or handle wild animals, especially bats.** Teach children never to touch wild animals or handle bats, even dead ones. Ask children to tell an adult if they see or find a bat.
- **Vaccinate dogs and cats against rabies.** Cats are especially susceptible to rabies exposure from bats because cats catch bats more often than dogs do. All dogs and cats should have a current rabies vaccination certificate.
- **Bat-proof your house.** Close all outside openings larger than 3/8" in the walls, roofs, and floors. Put screens on all windows, doors and chimneys to prevent bats from entering.
- **Watch for abnormal wild animal behavior.** Most wild animals are not seen during the daytime. If you see one and it is acting strangely, leave it alone and contact your local health department or animal control agency.

If you or your child has any contact with a bat, or are bitten or scratched by any wild or stray animal, please do the following:

- **Wash** any bite or wound with soap and water.
- **Contact a health care provider for appropriate follow-up.**
- **Contact** the local health department or the Department of Public Health and Human Services at (406) 444-0273.

If you find a bat in your home or find your pet with a bat, safely capture the bat, if possible. **DO NOT TOUCH THE BAT WITH YOUR BARE HANDS!** Use heavy leather gloves, a heavy towel, or tongs to pick up the bat. Put it in a container and cover with a tight lid. Do not damage the head of the bat, because the brain is needed for the rabies test.

For additional information on bats and rabies visit the Centers for Disease Control and Prevention website at <http://www.cdc.gov/rabies/> or call the Department of Livestock at (406) 444-9761 or the Department of Public Health and Human Services Communicable Disease Epidemiology Program at (406) 444-0273.

**DEPARTMENT OF
PUBLIC HEALTH AND HUMAN SERVICES**



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MEMORANDUM

Date: June 14, 2010

To: Montana Camp Directors

From: Steven D. Helgerson, MD, MPH

State Medical Officer/Acting State Epidemiologist

Re: Reducing the risk of rabies at summer camp

The summer camp season has begun. This means there will be many opportunities to observe and interact with wild animals. While observation of wildlife is encouraged and often one of the primary goals of attending summer camp, it is important to realize that direct contact with wild animals can result in disease transmission. Rabies is a disease caused by a virus that attacks the nervous system and is almost always fatal once symptoms appear. The virus is transmitted in the saliva of rabid animals, typically by a bite. In Montana, rabies is found most frequently in bats, skunks, cats, cows and horses. However, all mammals, including other wildlife, farm animals, and dogs, can get infected with and transmit rabies. When a person has been bitten or otherwise exposed (e.g., scratched) to a potentially rabid animal, treatment to prevent rabies may be warranted.

Be aware that bats may sometimes seek shelter in camp cabins and can result in exposure for campers. If you receive any reports of bats found in cabins at your camp during camp season, please contact your local health department for a risk assessment to determine whether campers or camp staff may have been exposed.

To reduce the risk of rabies transmission at summer camp, instruct campers and camp staff:

- Not to touch or feed wild or stray animals.
- Avoid sick animals and those acting in an unusual manner.

An Equal Opportunity Employer



- Cover garbage cans securely and do not leave food outside.
- Prevent bats from entering buildings and cabins.
- Following a bite or other exposure to an animal, wash wounds immediately with soap and water and contact local public health authorities to determine whether treatment for rabies is indicated.

Additional resources include:

- For information on how to bat-proof cabins, please refer to the Montana Department of Public Health and Human Services' website at <http://www.dphhs.mt.gov/PHSD/epidemiology/cdepi-rabies.shtml>. Your local health department can also provide bat-proofing tips.
- For additional information on rabies, bats and summer camps, please refer to the Centers for Disease Control and Prevention's (CDC) website: http://www.cdc.gov/rabies/qanda/bats_camps.html.
- And see the attached brochure "Bats and Rabies".

Please contact the DPHHS Communicable Disease/Epidemiology Section at (406) 444-0273 or your local health department with any questions about rabies in Montana and how to reduce the risk of rabies transmission to summer campers.

We wish you a fun and rabies-free camp season!

cc:

Local Health Department Communicable Disease Directors

Dr. Martin Zaluski, State Veterinarian, Department of Livestock

BATS AND RABIES

A public health guide



What is rabies and how do people get it?

Rabies is an infectious viral disease that affects the nervous system of humans and other mammals. People get rabies from the bite of an animal with rabies (a rabid animal). Any wild mammal, like a raccoon, skunk, fox, or bat, can have rabies and transmit it to people. It is also possible, but quite rare, that people may get rabies if infectious material from a rabid animal, such as saliva, gets directly into their eyes, nose, mouth, or a wound.

Because rabies is a fatal disease, the goal of public health is, first, to prevent human exposure to rabies by education and, second, to prevent the disease by anti-rabies immunization if exposure occurs. Tens of thousands of people are successfully vaccinated each year after being bitten by an animal that may have rabies. However, a few people die of rabies each year in the United States, usually because they do not recognize the risk of rabies from the bite of a wild animal and do not seek medical advice.

Why should I learn about bats and rabies?

Most of the recent human rabies cases have been caused by rabies viruses associated with bats. Awareness of the facts about bats and rabies can help people protect themselves, their families, and their pets. This information may also help clear up misunderstandings about bats.

There are many rumors and legends about bats which are not true. Bats are not blind. They are neither rodents nor birds. Only three species in Latin America feed on blood after inflicting small bite wounds – and most bats do not have rabies. Bats play key roles in ecosystems around the globe, from rain forests to deserts, especially by eating insects, including agricultural pests. The best protection we can offer these unique mammals is to learn more about their habits and recognize the value of living safely with them.

Cover photo: Eastern red bats, like this mother and her pups roost in trees across most of eastern North America. Most bats bear only one pup each, but red bats often give birth to twins and have as many as five offspring. Adults usually roost alone.



Mexican free-tailed bats roost in caves, mines and under bridges, forming colonies that can number in the millions. They eat enormous amounts of insects, including many costly agricultural pests.

How can I tell if a bat has rabies?

Rabies can be confirmed only in a laboratory. However, any bat that is active by day, found in a place where bats are not usually seen (for example, in a room in your home or on the lawn), or unable to fly, is far more likely than others to be rabid. Such bats are often the most approachable. Because there is no guarantee that a rabid bat will behave any differently than a normal one, it is best never to handle any bat.

What should I do if I come in contact with a bat?

If you are bitten by a bat – or if infectious material (such as saliva) from a bat gets into your eyes, nose, mouth, or a fresh wound – wash the affected area thoroughly with soap and water and get medical advice immediately. Whenever possible, the bat should be captured and sent to a laboratory for rabies testing (see “How can I safely capture a bat in my home?”).

People usually know when they have been bitten by a bat. However, because bats have small teeth which may leave marks that are not easily seen, there are situations in which you should seek medical advice even in the absence of an obvious bite wound. For example, if you are a deep sleeper or

using sleep medications and find a bat in your room or if you see a bat in the room of an unattended child or near a mentally impaired or intoxicated person, seek medical advice and have the bat tested.

People cannot get rabies just from seeing a bat in an attic, in a cave, or at a distance. In addition, people cannot get rabies from having contact with bat guano (feces), blood, or urine, or from touching a bat on its fur (even though bats should never be handled!).

What should I do if my pet is exposed to a bat?

If you think your pet or domestic animal has been bitten by a bat, immediately contact a veterinarian or your health department for assistance and have the bat tested for rabies. Remember to keep vaccinations current for cats, dogs, and other animals.



Big brown bats usually live under the bark or in cavities of trees, as well as in various buildings. They feed mostly on beetles, but also hunt an assortment of night-flying insects.

How can I keep bats out of my home?

Some bats live in buildings, and there may be no reason to evict them if there is little chance for contact with people. However, bats should always be prevented from entering rooms of your home. For assistance with “bat-proofing” your home, contact an animal-control or wildlife conservation agency. If you choose to do the “bat-proofing” yourself, here are some suggestions. Carefully examine your home for holes

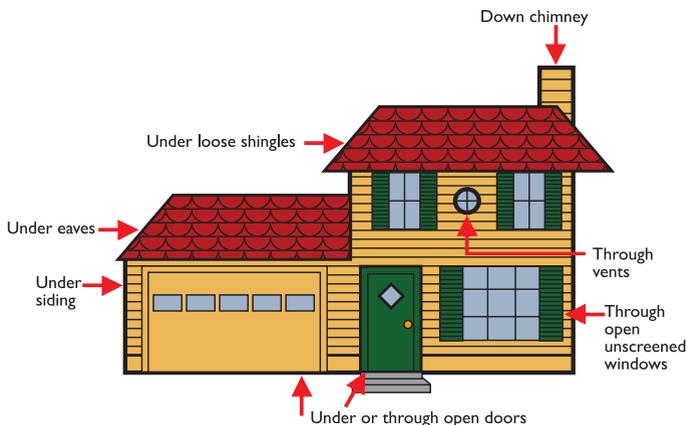
that might allow bats entry into your living quarters. Any openings larger than a quarter-inch by a half-inch should be caulked. Use window screens, chimney caps, and draft-guards beneath doors to attics, fill electrical and plumbing holes with steel wool or caulking, and ensure that all doors to the outside close tightly.

Additional “bat-proofing” can prevent bats from roosting in attics or buildings by covering outside entry points. Observe where the bats exit at dusk and exclude them by loosely hanging clear plastic sheeting or bird netting over these areas. Bats can crawl out and leave, but cannot reenter. After the bats have been excluded, the openings can be permanently sealed. For more information about “bat-proofing” your home, visit Bat Conservation International’s website (see end of brochure).

Things to remember when “bat-proofing”

- During summer, many young bats are unable to fly. If you exclude adult bats during this time, the young may be trapped inside. Thus, if possible, avoid exclusion from May through August.
- Most bats leave in the fall or winter to hibernate, so these are the best times to “bat-proof” your home.

Common Bat Entry Points



How can I safely capture a bat in my home?

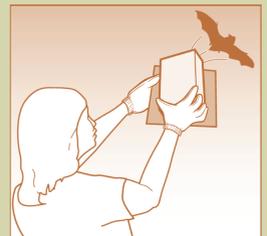
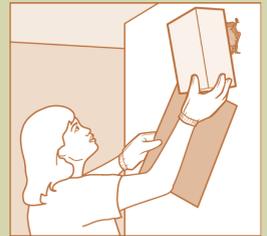
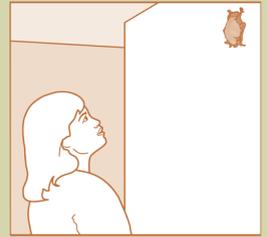
If a bat is present in your home and you cannot rule out the possibility of exposure, leave the bat alone and contact an animal-control or public health agency for assistance. If professional help is unavailable, use precautions to capture the bat safely, as described below.

What you will need:

- leather work gloves (put them on)
- small box or coffee can
- piece of cardboard
- tape

When the bat lands, approach it slowly, while wearing the gloves, and place the box or coffee can over it. Slide the cardboard under the container to trap the bat inside. Tape the cardboard to the container securely, and punch small holes in the cardboard, allowing the bat to breathe. Contact your health department or animal-control authority to make arrangements for rabies testing.

If you see a bat in your home and you are sure no human or pet exposure has occurred, confine the bat to a room by closing all doors and windows leading out of the room except those to the outside. The bat will probably leave soon. If not, it can be caught, as described, and released outdoors away from people and pets.





Silver-haired bats often roost in hollows and cavities of old-growth trees. Their unique coloration makes them difficult to spot.

How can rabies be prevented?

- Teach children never to handle unfamiliar animals, wild or domestic, even if they appear friendly. “Love your own, leave other animals alone” is a good principle for children to learn.
- Wash any wound from an animal thoroughly with soap and water and seek medical attention immediately.
- Have all dead, sick, or easily captured bats tested for rabies if exposure to people or pets occurs.
- Prevent bats from entering living quarters or occupied spaces in homes, churches, schools, and other similar areas where they might contact people and pets.
- Be a responsible pet owner by keeping vaccinations current for all dogs, cats, and ferrets. Keep your cats and ferrets inside and your dogs under direct supervision, call animal control to remove stray animals from your neighborhood, and consider having your pets spayed or neutered.

Case Study

During October 2008, a 55-year old man and his family noticed a bat that roosted in the rafters of their porch for several days before it flew into their house. The man captured the bat and allowed it to crawl up his arm and neck where it bit him on the ear. At the time, the man mentioned the possibility of rabies to his family, but did not report the incidence to public health authorities or seek medical advice. The man left the bat unrestrained in the house for two days before releasing the bat after concluding that it was not sick. Four to six weeks later, the man became sick and died of rabies. Diagnostic testing confirmed a rabies virus variant associated with bats.

This case demonstrates several points:

- Unlike cats, dogs, and ferrets there is no observation period that can safely rule out the possibility of rabies transmission from a bat or other wild animal exposures.
- Persons should never handle wild animals. If contact with the bat had been avoided the bite most likely would not have occurred. If a wild animal is easily approachable, rabies should be suspected.
- If the bat had been submitted for rabies testing instead of released, a positive test could have led to life-saving rabies vaccination.

Remember, in situations in which a bat is physically present and you cannot reasonably rule out having been bitten, safely capture the bat for rabies testing and seek medical attention immediately.

The little brown bat is one of America’s most abundant and widespread species. It is often found roosting in attics or barns.





Hoary bats have long, white-tinged fur that gives them a frosted appearance. They eat moths and a wide range of other insects.

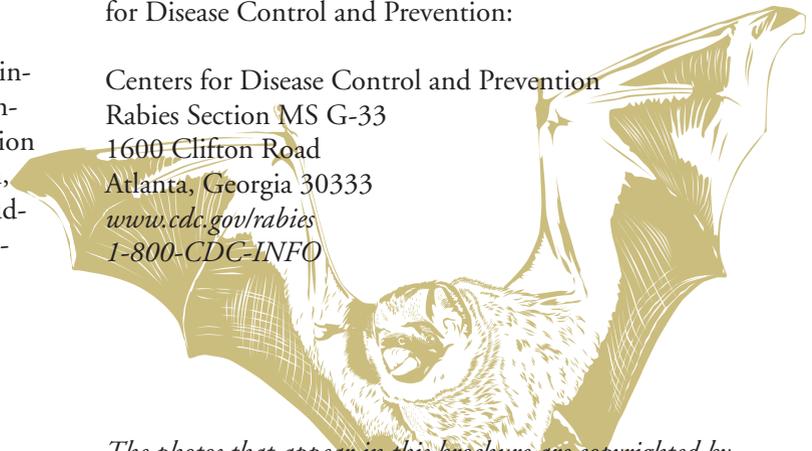
To learn more about endangered bats and the Endangered Species Act, contact the U S Fish and Wildlife Service:

U S Fish and Wildlife Service
Division of Endangered Species
4401 N. Fairfax Drive, Room 452
Arlington, Virginia 22203
www.fws.gov

Where can I learn more about rabies?

Contact your state or local health department or the Centers for Disease Control and Prevention:

Centers for Disease Control and Prevention
Rabies Section MS G-33
1600 Clifton Road
Atlanta, Georgia 30333
www.cdc.gov/rabies
1-800-CDC-INFO



Are bats beneficial?

Yes. Worldwide, bats are a major predator of night-flying insects, including pests that cost farmers billions of dollars annually. Throughout the tropics, seed dispersal and pollination activities by bats are vital to rainforest survival. In addition, studies of bats have contributed to medical advances, including the development of navigational aids for the blind. Unfortunately, many local populations of bats have been destroyed and many species are now endangered.

Where can I learn more about bats?

Contact your state or local wildlife conservation agency or Bat Conservation International:

Bat Conservation International, Inc.
P O Box 162603 Austin, Texas 78716
www.batcon.org

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Questions and Answers about Rabies, Bats and Summer Camps

The Centers for Disease Control and Prevention (CDC) has been collaborating with two summer camps and state and local health departments in multiple states to investigate reports of the presence of bats at the summer camps and assess the potential for exposures to rabies.

- **What is rabies and how do people get it?**
- **Why should I learn about bats and rabies?**
- **How can I tell if a bat has rabies?**
- **What should I do if I come in contact with a bat?**
- **Do I need to be concerned about rabies while camping?**
- **Why is there a concern about bats and rabies?**
- **If vaccination is effective, why do people still die of rabies in the USA?**
- **My child was at a camp this summer. Sometimes he saw bats inside the structure where he slept. Is he at risk for an exposure to rabies?**
- **How will I know if my child was potentially exposed to rabies by bats while at camp?**
- **How will my health department help me if bats occurred at my summer camp and I have questions?**
- **How does a rabid bat act?**
- **My child says he was bitten by a bat at camp. What should I do?**
- **What is the post-exposure prophylaxis for rabies?**
- **I am receiving rabies PEP due to exposure to a rabid animal can I give rabies to other people?**
- **I have had contact with a person who is undergoing rabies PEP could this person give me rabies, and should I receive PEP?**
- **Will the rabies vaccine make me sick?**

What is rabies and how do people get it?

Rabies is an infectious viral disease that affects the nervous system of humans and other mammals. People get rabies from the bite of an animal with rabies (a rabid animal). Any wild mammal, like a raccoon, skunk, fox, coyote, or bat, can have rabies and transmit it to people. It is also possible, but quite rare, that people may be exposed to rabies if infectious material from a rabid animal, such as saliva, gets directly into their eyes, nose, mouth, or a wound.

Rabies is a fatal disease. The goal of public health is, first, to prevent human exposure to rabies by education and, second, to prevent the disease by anti-rabies vaccination if exposure occurs.

Each year, tens of thousands of people are successfully protected from developing rabies through vaccination after being bitten by an animal that may have rabies. A few people die of rabies each year in the United States, usually because they do not recognize the risk of rabies from the bite of a wild animal and do not seek medical advice.

Why should I learn about bats and rabies?

Most of the recent human rabies cases in the United States have been caused by rabies viruses from bats. Awareness of the facts about bats and rabies can help people protect themselves, their families, and their pets. This information may also help clear up misunderstandings about bats.

When people think about bats, they often imagine things that are not true. Bats are not blind. They are neither rodents nor birds. They will not suck your blood -- and most bats do not have rabies. Bats play key roles in ecosystems around the globe, from rain forests to deserts, especially by eating insects, including agricultural pests. The best protection we can offer these unique mammals is to learn more about their habits and recognize the value of living safely with them.

How can I tell if a bat has rabies?

Rabies can be confirmed only in a laboratory. However, any bat that is active by day, is found in a place where bats are not usually seen (for example, in a room in your home or on the lawn), or is unable to fly, is far more likely than others to be rabid. Such bats are often the most easily approached. Therefore, it is best never to handle any bat.

What should I do if I come in contact with a bat?

If you are bitten by a bat -- or if infectious material (such as saliva or brain material if it is killed) from a bat gets into your eyes, nose, mouth, or a wound -- wash the affected area thoroughly and get medical advice immediately. Whenever possible, the bat should be captured and sent to a laboratory for rabies testing.

People usually know when they have been bitten by a bat. However, most types of bats have very small teeth which may leave marks that disappear quickly. There are situations in which you should seek medical advice even in the absence of an obvious bite wound. For example, if you awakened because a bat landed on you while you were sleeping, if you awakened and found a bat in your room, if you see a bat in a room with an unattended child, or see a bat near a mentally impaired or intoxicated person, try to safely capture the bat and have the bat tested, and seek medical advice.

People cannot get rabies just from seeing a bat in an attic, in a cave, at summer camp, or from a distance while it is flying. In addition, people cannot get rabies from having contact with bat guano (feces), blood, or urine, or from touching a bat on its fur (even though bats should never be handled!).

Do I need to be concerned about rabies while camping?

More than 11 million persons enjoy camping each year in the USA. Few individuals will ever be exposed to a rabies-suspect animal or need medical intervention due a potential exposure while camping. To date, no human rabies cases due to bats in the USA have implicated camping as a risk factor for an unrecognized exposure.

Why is there a concern about bats and rabies?

Rabies in humans is rare in the USA. There are usually 1-2 human cases per year. The most common source of human rabies in the USA is from bats. For example, among the 19 naturally acquired cases of rabies in humans in the USA from 1997-2006, 17 were associated with bats. Among these, 14 patients had known encounters with bats. Four people awoke because a bat landed on them and one person awoke because a bat bit him (these events occurred within their primary residences). One person was reportedly bitten by a bat from outdoors while he was exiting from his residence. Six persons had a history of handling a bat while removing it from their primary residences. One person was bitten by a bat while releasing it outdoors after finding it on the floor inside a building. One person picked up and tried to care for a sick bat found on the ground outdoors. Three males ages 20, 29 and 64 had no reported encounters with bats but died of bat-associated rabies viruses.

If vaccination is effective, why do people still die of rabies in the USA?

In some cases, persons who died of rabies knew they were bitten by a bat. However, they may not have been aware that bats can have rabies and transmit it through a bite, and so did not seek medical attention. In other cases, it appears possible that young children may not fully awaken due to the presence of a bat (or its bite) or may not report a bite to their parents. For example, one 4-year-old patient, who died of rabies, was still sleeping when her caregivers checked on her because they heard strange noises that were from a bat that was found on the floor of her bedroom. She was most likely bitten and did not fully awaken. This patient developed parasthesia (an abnormal sensation which may occur at the site of a rabies exposure) on her neck as she became sick with rabies a few weeks later. In another case, a 10-year-old child removed a bat from his bedroom without adult supervision and several months later developed parasthesia on his arm and one side of his head as he became sick with rabies.

My child was at a camp this summer. Sometimes he saw bats inside the structure where he slept. Is he at risk for an exposure to rabies?

Most bats are not rabid. Sometimes, bats are infected with rabies and may pose a risk for exposure to humans. In camp situations where bats are observed, post-exposure vaccination should be considered when a person is bitten by a bat and the animal tests positive (or is not available for testing), or when contact between a human and a bat has occurred or was likely and uncertainty exists as to whether a bite may have occurred (e.g., in situations involving people awakening due to the presence of a bat on or near them, or when a bat is observed in the immediate vicinity of an infant or young child, or persons with reduced mental function due to medication, alcohol, illness, age, etc.). In many camp situations, the mere presence or sighting of

bats is common and normal. Precautions (such as avoiding intentional contact with a bat, using screens or mosquito netting) may be needed to prevent potential exposures to rabies.

If bats were present when campers were sleeping, a careful assessment by local or state public health professionals of the potential for rabies exposure on a case-by-case basis needs to occur. Campers who may have been bitten by a bat, had direct contact with a bat, or were awakened by the presence of a bat near or on them need to be identified for appropriate evaluation, and, if needed, vaccinated to prevent rabies.

How will I know if my child was potentially exposed to rabies by bats while at camp?

You will need to find out from your child if he or she was bitten by a bat or had direct physical contact with a bat or awakened or fell asleep in close proximity to bats. If this has occurred, a careful evaluation should be made in consultation with knowledgeable public health professionals. There are many complex factors to consider but some things will help in these evaluations. For example, if your child slept under mosquito netting or in an enclosure where bats were excluded by screening, this would reduce considerably any possibility of your child being bitten by a bat without your child's awareness of the incident.

How will my health department help me if bats occurred at my summer camp and I have questions?

In a risk assessment where campers have seen bats, public health professionals will consider how many people saw bats, where and when the bats were seen, whether or not supervisory adults were present or made bed checks and how often, the age of the campers, the number of persons present in a sleeping area, the mental function of persons in this situation, the type, size, age and history of the structure in which the bats were found, the time of year, and, if it can be determined, the species of the bat.

How does a rabid bat act?

Most bats do not have rabies. For example, even among bats submitted for rabies testing because they could be captured, were obviously weak or sick, had been captured by a cat, etc., only about 6% have rabies. Rabid bats may be found on the ground unable to fly. Rabid bats may also be found dead on the floor. If a bat is present, and especially if it appears abnormal (i.e., cannot fly or has died), and persons have awakened to find it on them or close to them or within their immediate vicinity, then the animal should be tested for rabies. Under these conditions, the probability of it being rabid is about 6%. If the animal is not tested for rabies, one will have to assume that it may have been rabid. Each individual (or their parent) will have to decide if they think they would have been aware or awakened by contact with a bat or a bite from a bat.

My child says he was bitten by a bat at camp. What should I do?

If the bat was captured, tested, and is negative for rabies, your child will not need human rabies post-exposure prophylaxis. If it tests positive or is not available for testing then it would have to be assumed that the bat may have had rabies and post-exposure prophylaxis should be initiated

without delay. Children should be encouraged to wash any wounds, especially animal bites, thoroughly with soap and water, as soon as possible, and to report encounters with bats, and any bite from an animal, to an adult.

What is the post-exposure prophylaxis for rabies?

Rabies post-exposure prophylaxis (or PEP), consists of a dose of human rabies immune globulin and 4 doses of rabies vaccine given on days 0, 3, 7, and 14. The vaccine is given in a muscle, usually in the upper arm. The PEP is highly effective at preventing rabies if given as soon as possible following an exposure. If a person has previously received rabies PEP or was pre-exposure vaccinated against rabies, only 2 doses of vaccine (on days 0 and 3) will be needed. Human rabies immune globulin is not required. Your healthcare provider and local health department will be able to tell you where to obtain PEP.

Human Rabies Prevention -- United States, 2008

I am receiving rabies PEP due to exposure to a rabid animal can I give rabies to other people?

Persons cannot transmit rabies to other people unless they themselves are sick with rabies. The prophylaxis you are receiving will protect you from developing rabies, and therefore you cannot expose other people to rabies. You should continue to participate in your normal activities.

I have had contact with a person who is undergoing rabies PEP could this person give me rabies, and should I receive PEP?

A healthy person undergoing PEP after a potential exposure does not have rabies and cannot transmit it to another person. An exposed person receives rabies PEP to prevent them from developing rabies.

Will the rabies vaccine make me sick?

Adverse reactions to rabies vaccine and immune globulin are not common. Newer vaccines in use today cause fewer adverse reactions than previously available vaccines. Mild, local reactions to the rabies vaccine, such as pain, redness, swelling, or itching at the injection site, have been reported. Rarely, symptoms such as headache, nausea, abdominal pain, muscle aches, and dizziness have been reported. Local pain and low-grade fever may follow injection of rabies immune globulin.

Content Source: **National Center for Zoonotic, Vector-Borne, & Enteric Diseases (ZVED)**
Page Located on the Web at http://www.cdc.gov/rabies/qanda/bats_camps.html



FAQs About Bats

How do bats move around in the dark?

All bats can see, but some use a special sonar system called echolocation. They make high frequency calls out of their mouths or noses then listen for echoes to bounce from the objects in front of them. In this way, bats are able to avoid predators, maneuver around obstacles, and capture insects in total darkness.

How and why do bats hang upside down?

Unlike bodies of other animals, a bat's body is best adapted for hanging upside down. Its hind limbs are rotated 180 degrees so its knees face backwards. Bats have specialized tendons that hold their toes in place so they are able to cling to their roosts without expending any energy. Hanging upside down allows bats to use unique places in caves and buildings where they are safe from predators.

Why is there a concern about bats and rabies?

Rabies in humans is rare in the United States. There are usually 1-2 human cases per year. The most common source of human rabies in the United States is from bats. When people are bitten by other animals, the bites are usually large enough that they consult their health care provider, and are evaluated for

cont. next page

BATS

SAFETY AND RISK MANAGEMENT AT CAMP

The United States is home to more than 40 varieties of bats. They eat insects harmful to agriculture, including night flying beetles and moths. However, some bats may be infected by and transmit the rabies virus.

Most of the recent human rabies cases in the United States have been caused by rabies viruses associated with bats. Potential exposures to bats do occur, sometimes requiring individuals to undergo rabies post-exposure prophylaxis, i.e., rabies vaccinations.

Keep in mind, however, that more than 11 million children and adults engage in camp experiences each year in the United States. Few individuals will ever be exposed to a rabies-suspect animal or need medical intervention due to a potential exposure while camping. In the United States, there have been no human rabies deaths occurring as a result of a bat exposure in a camp setting.

Awareness of the facts about bats and rabies can help protect yourself and your campers. This information may also promote a better understanding of bats, their contributions to the environment, and what you can do to safeguard against bat-transmitted disease.

REDUCING EXPOSURE TO BATS

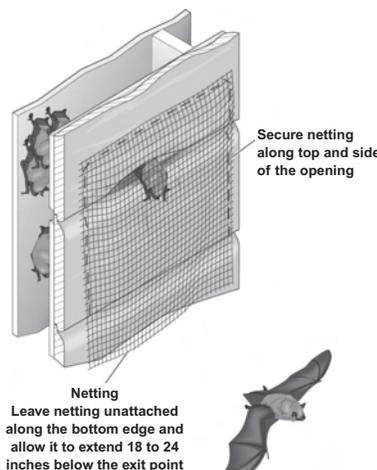
Bats are beneficial to our environment and often present in summer camp settings. To reduce bat exposure in the camp environment:

1. Bat-proof when possible
2. Use mosquito netting

Bat-Proofing Buildings

Bats may use buildings as shelter or for protection from other animals. Bats can enter buildings through very small ($\frac{1}{2}$ - $\frac{1}{4}$ inch) spaces. If the camping environment has cabins or shelters that can be bat-proofed, follow these recommendations:

- Bat-proof between September and April, as most bats leave in the fall and winter to hibernate. This will also prevent young bats, unable to fly, from being trapped inside the structure.
- In the spring and summer, exclude bats by observing where from the building bats exit at dusk and hanging clear plastic sheeting or bird netting over these areas. Bats can leave, but cannot re-enter (see figure).
- After the bats have been excluded, seal openings. Fill openings with caulk, steel wool, or mesh hardware cloth.



- Inspect for any other potential cracks, crevices, and holes even if not currently being used by bats exiting the structure.
- Replace severely warped or damaged boards.
- Use proper attic ventilation and screen all vents.
- Keep window screens in good repair and don't leave unscreened doors and windows open.

FAQs About Bats

Why is there a concern about bats and rabies?

possible rabies exposure. However, bat bites are small and people may not consult their health care providers after exposure.

How common is rabies in bats?

Most bats are not rabid. Rabid bats may appear weak, unable to fly, and may make unusual noises. However, because rabies can only be determined by laboratory testing, you cannot tell if a bat is rabid just by observing its behavior. If you are exposed to a bat, wash the exposed area with soap and water, capture the bat for testing, and seek medical attention. Your local or state health department can provide assistance as needed.

Are bats beneficial?

Yes. Worldwide, bats are a major predator of night-flying insects, including pests that cost farmers billions of dollars annually. Small insectivorous bats can eat up to 2,000 insects in one night. Throughout the tropics, seed dispersal and plant pollination by bats are vital to rainforest survival. In addition, studies of bats have contributed to medical advances including the development of navigational aids for the blind. Unfortunately, many local populations of bats have been destroyed and many species are now endangered.



Photo of mosquito netting over bed. Mosquito netting can be used when cabins or tents are not already screened. *Photo courtesy of the Girl Scout Council of the Nations Capital.*

Using Mosquito Netting

When used properly, mosquito netting over beds will prevent exposure to mosquitoes and bats while sleeping. Netting is recommended when screening is not an option. To use netting,

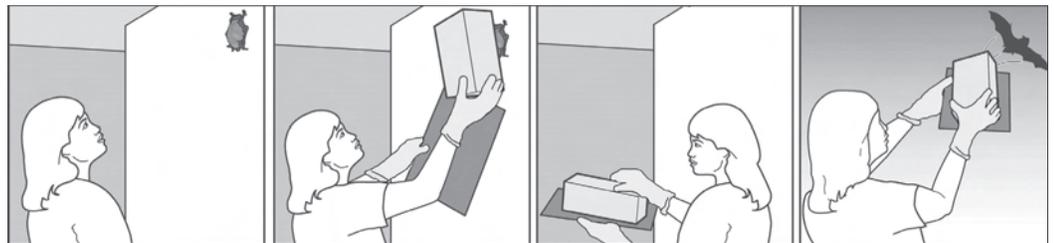
- **Elevate netting above the camper's bed. Cover the length of the mattress. Attach poles to the ends of the bed (see picture for example).**
- **Tuck netting under the camper's mattress.**
- **At the end of the season, store netting in rodent-proof containers.**
- **Inspect mosquito netting regularly to ensure it is free of holes.**

CAPTURING AND REMOVING BATS

Assemble and store a bat-capture kit. Store it in a location where it can be quickly gathered if a bat is found in a camp facility. The kit should contain:

- **Leather or suitable work gloves**
- **Box, coffee can, or plastic container with a lid**
- **Piece of flat cardboard**
- **Net on a long pole**

Any bat that may have exposed someone to rabies, should be captured for testing (see below). If you are certain there was no possible rabies exposure, then the bat should be returned to the wild.



Graphics courtesy of Bat Conservation International

To Capture a Bat:

1. **Put on leather or other suitable work gloves.**
2. **Take the box, coffee can, or plastic container and the flat piece of cardboard.**
3. **Wait for the bat to roost on a wall or floor.**
4. **Slowly approach the bat and cover it with the container.**
5. **Keeping the container flat against the wall, slide the lid or cardboard between the wall and bat.**

FAQs About Bats

Where can I learn more about bats?

Contact state or local wildlife conservation agency or Bat Conservation International by visiting www.batcon.org. To learn more about endangered bats and the Endangered Species Act, contact the U.S. Fish and Wildlife Service: www.fws.gov.

Where can I learn more about rabies?

Contact state or local health departments or the Centers for Disease Control and Prevention by visiting www.cdc.gov/rabies <<http://www.cdc.gov/rabies>>

6. Once the cardboard is covering all sides of the container, lift the container and cardboard away from the wall.
7. If no one was exposed to the bat, take the covered container outside and set it on a table or railing.
8. Remove the container covering and turn the container on its side. Return inside, the bat will fly away on its own.
9. If a person is exposed to the bat, capture the bat for testing by securing the lid or cardboard to the container so the bat cannot escape. Follow directions below for seeking medical attention.
10. Capture a bat in hard-to-reach areas with a net on a long pole. Then bring net down to a container, and drop/push (wearing gloves) the bat into the container.

Handling Human Exposure to a Bat

If you or a camper are bitten by or possibly exposed to a bat -- including from saliva that gets into your eyes, nose, mouth, or wounds, wash the affected area thoroughly and get medical attention immediately.

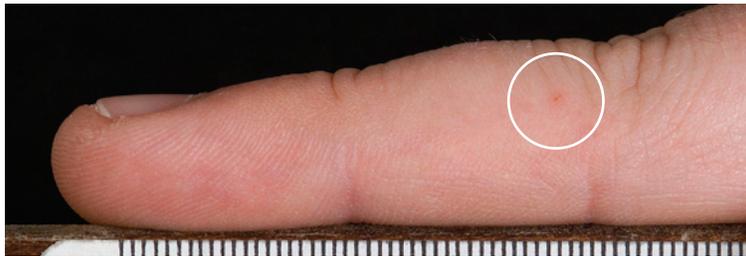


Photo of a bat bite on finger. *Photo courtesy of CDC.*

Bats have small teeth that may leave marks not easily seen (see picture). Although many people know if they have been bitten by a bat, there are certain circumstances when a person might not be aware or able to tell if she has been bitten. For example:

- If a person awakes to find a bat in the room
- If you find a bat in a room with an unattended child
- If you see a bat near a person with a disability

In these circumstances, a person should seek medical attention and have the bat tested for rabies.

In all circumstances, contact local or state health departments for assistance with medical advice and testing bats for rabies. If a bat cannot be confirmed as negative, rabies post-exposure treatment may need to be considered. To capture the bat for testing, follow the procedures above for trapping the bat, but secure the lid or cardboard to the container so the bat cannot escape.

People cannot get rabies just from seeing a bat outside or at a distance. In addition, people cannot get rabies from having contact with bat guano (feces), blood, or urine, or from touching a bat on its fur. Remember, just to be safe, bats should never be handled.

Coping With Bats in Montana Homes

by James Knight, Extension Wildlife Specialist

For reasons of health, odor and cleanliness, most people do not wish to live in close proximity with bats. Their nocturnal movements and quick flight patterns often give us cause for alarm.

But despite their “reputation,” bats provide millions of dollars worth of benefits that should be recognized. Bats are crucial to pollination of many plants, they reduce disease vectors, and they fill a key ecological niche.

This MontGuide describes some of the characteristics of bats and offers several solutions for coping with bats who have taken up residence in human households.

Characteristics of bats

Bats are small mammals, averaging three to five inches in length.

A few species are solitary, but most bats congregate in groups or

colonies. Most leave their roosting places at dusk to fly about in pursuit of the night-flying insects that provide the bulk of their food.

All bats in Montana are insectivorous, feeding on a variety of flying insects. Many of these insects are harmful to humans. A bat can consume insects equal to one-third of its body weight in 1/2 hour of foraging. The bat may fill its stomach in about one hour with prey including beetles, moths, flying ants, true bugs, mayflies, caddis flies and other insects. The nightly consumption of insects by a colony of bats can be extremely large.

Two bats common in Montana are the big brown bat and the hoary bat (Figure 1). Bats in Montana migrate with the change in seasons, following a steady source of food supply. Some bats come to Montana only during the colder months.



Figure 1. Hoary bat

By day, bats roost in dark, sheltered places. They hang head-down, firmly secured by hooking their toes into cracks or around small projections. From this position they drop from the roost by releasing their grasp. Momentum from the fall helps them become airborne. Most bats cannot take off from a flat surface.

Originally, bats roosted in natural shelters, such as caves and hollow trees. Many still do, but others have found attics, spaces between building walls and unused areas in upper stories much to their liking. The noises created by



crawling and squeaking bats are usually disturbing to the householder.

The major objection to their presence in buildings is the bat excrement. This excrement persists for a long time after the roost is broken up, and some experts speculate it may serve to attract new colonies if thorough sanitary measures are not taken.

Bat excrement

Bat excrement (guano) produces an unpleasant odor as it decomposes in attics, wall spaces and other voids. The pungent, musty, acrid odor can often be detected from outside a building containing a large or long-term colony. Similar odor problems occur when animals die in inaccessible locations. The odor also attracts arthropods, which may later invade other areas of a building.

Bat guano may provide a growth medium for microorganisms, some of which are pathogenic (histoplasmosis, for example). Excessive guano can lead to stained ceilings, soffits and siding, producing unsightly and unsanitary conditions.

Bats also urinate and defecate in flight, causing multiple spottings and stains on sides of buildings, windows, patio furniture, automobiles and other objects at and near entry/exit holes or beneath roosts. Bat excrement may contaminate stored food, commercial products and work surfaces. Although the fresh urine of a single bat is relatively odorless, that of any moderate-sized colony is obvious, and the odor increases during damp weather.

The close proximity of bat roosts to human living quarters can result in excreta, animal dander, fragments of arthropods and various microorganisms entering air

ducts as well as falling onto the unfortunate residents below. Such contaminants can result in airborne particles of public health significance.

Rabies

Bats, like any other mammal, can transmit the rabies virus to humans. Domestic dogs, domestic cats, skunks, foxes and bats have a higher occurrence of rabies than other mammals. Any bat acting in an abnormal manner should be approached with caution, particularly if found fluttering on the ground. Bat bites should be treated by a physician, and the bat should be captured without injury to the head so the brain can be examined by proper authorities.

Control techniques

The only way to permanently rid a building of bats is to eliminate all possible entrances. Repellents are not lasting control methods, and there are no toxicants registered for bats in Montana. Bat-proofing a building is the only efficient and permanent way to eliminate bats.

Bat-proofing buildings

Bats may enter buildings through large or small openings such as unprotected louvers or vents, broken windows or other open spaces. They may enter through old worn sidings or around eaves or cornices. The smaller species of bats can crawl through slits as narrow as 3/8 of an inch. It is necessary, therefore, to eliminate all possible entrances.

The larger openings should be covered with sheet metal or with 1/4-inch mesh hardware cloth if ventilation is necessary. It is essential that no openings larger than 1/4-inch are left. Many openings

are best plugged and sealed with caulking compound. Foam injected in cracks, crevices, roof edges, door jambs, overhangs and similar openings can eliminate smaller entrances.

Control steps

To begin bat control, first identify the primary entrances used by the bats. Do not close these until after the bats have had two opportunities to leave the roost.

In the evening, about 30 minutes before dark, observe the area you suspect the bats may be using. You will probably be able to identify one or two spots they are using to enter and exit. The next day, plug all holes except the few you have identified as entrances or exits. This will allow the bats to leave the roost and these remaining holes can be plugged later. Be sure the holes you leave are being actively used by bats. A brown stain is usually apparent at the actively used entrances.

During the warmer months, bats normally have two feeding flights, one in early evening and one in the early morning. Normally, all occupants leave the roost within 15 to 20 minutes after the first one starts out. If they have been disturbed, however, the normal routine may be upset considerably.

The next step is to close the remaining holes in the evening about one hour after dark. They can be reopened for a few days just before dark to allow any remaining bats to leave. Remember, however, to close all entrances every night about one hour after dark. If any entrances have been overlooked, the bats will soon find them. It may be necessary to watch the building closely at dusk for several evenings.

One concern with this technique

relates to the presence of dependent young. If the bats are locked out while they have dependent young, it will cause mortality and a resulting odor. Males are often in small groups, (one to 20 for most species) and widely scattered. If possible, look into the roost for young bats.

Excluding a colony

Most bat species leave in winter, permitting exclusion in their absence. If you do not wish to wait for winter, there is a relatively simple exclusion technique that can be used after young are flying but prior to the winter months. Inexpensive light-weight polypropylene netting with a mesh-size of 1/4-inch or smaller can be obtained in quantity to cover areas of nearly any size. Hang the netting during daylight hours above areas where bats emerge, using duct tape or staples (Figure 2). A strip of net-



Fig. 2 Sample uses of plastic sheeting to allow bats to exit without opportunity for reentry

ting at least two feet wide, hung one to two inches in front of bat exit holes, and extending at least two feet below and to the side of exit points will allow the bats to emerge, but later they will be unable to find their way back. The netting acts as a simple one-way excluder until repairs can make the exclusion permanent. A sheet of clear, heavy-weight plastic (available at any hardware store) will have the same effect. The netting (or plastic) should be left in place for two to three days to assure that all bats have left the roost.

Repellents

Occasionally, temporary control can be accomplished by the use of repellents. Bats dislike the odor of naphthalene, a chemical commonly used as a moth and insect repellent. When the roost is located in attics or other closed spaces that can be reached easily, either of these materials may be used to temporarily drive them out. Three to five pounds of naphthalene flakes will usually be sufficient to treat the average attic. Sprinkle the material liberally over the entire area. Bats will usually leave the roost within a short time after it is introduced. The chemical dissipates rapidly on contact with air, however, and application has to be repeated often if no other control is practiced.

Bright lights used to illuminate the roost may also act as a repellent.

These techniques can be employed to remove bats while bat-proofing is being completed. The repellent techniques should not be considered a permanent solution to bat problems. Remember, bats are quite persistent, and it is often difficult to dislodge them from old established roosts.

Removal of occasional bat intruders

A bat that has blundered into the living quarters of a house will usually find its way out by detecting air movement. When no bite or contact with people or pets has occurred, the simplest solution for “removing” the bat is to try to confine it to one room, then open windows and doors leading outdoors and allow it to escape.

If the bat is present at night, the lights should be dimmed to allow the animal to find open doors and windows; some light is necessary if an observer is to ensure that the bat finds its way out. If bright lights are kept on, the bat may become confused and may seek refuge behind shelving, curtains, hanging pictures, or under furniture.

Healthy bats normally will not attack people, even when chased. Chasing a flying bat with a folded newspaper, tennis racket or stick will cause the bat to take evasive action, and a bat’s flight reversal to avoid a wall is often misinterpreted as an attack. These flailings, often futile, will cause a bat to seek safety wherever possible, making escape more difficult for the bat and more frustrating for the human.

If the bat has difficulty escaping, it can be captured in a hand net (for example, an insect net). Otherwise, wait for it to come to rest, quickly cover it with a coffee can or similar container, and slide a piece of cardboard or magazine under the can to trap the bat inside. Take the captured bat outdoors and release it away from populated areas, preferably after dark. Note that reasonably thick work gloves should be worn at all times when trying to capture a bat. Also, if a bite or physical contact occurs, capture the bat without damaging its head and immediately contact a physician.

Bat houses

For more than 60 years, artificial bat roosts have been used in Europe. Only recently have they gained some popularity in the United States. Though the results are variable, it appears that artificial houses, if properly constructed and located, can attract bats that are displaced or excluded from a structure (Figure 3). It sometimes helps to seed a new bat house with guano from the excluded site.

Alternate roosts should be located away from human high-use areas. Thus, people can enjoy the benefits of bats without sharing their dwellings with them and with little risk of direct contact with them.

Summary

Bats are often misunderstood. They perform a valuable natural function but are understandably unwelcome when they take up residence in certain places. Exclusion or "bat-proofing" is the only sure solution to a bat problem.

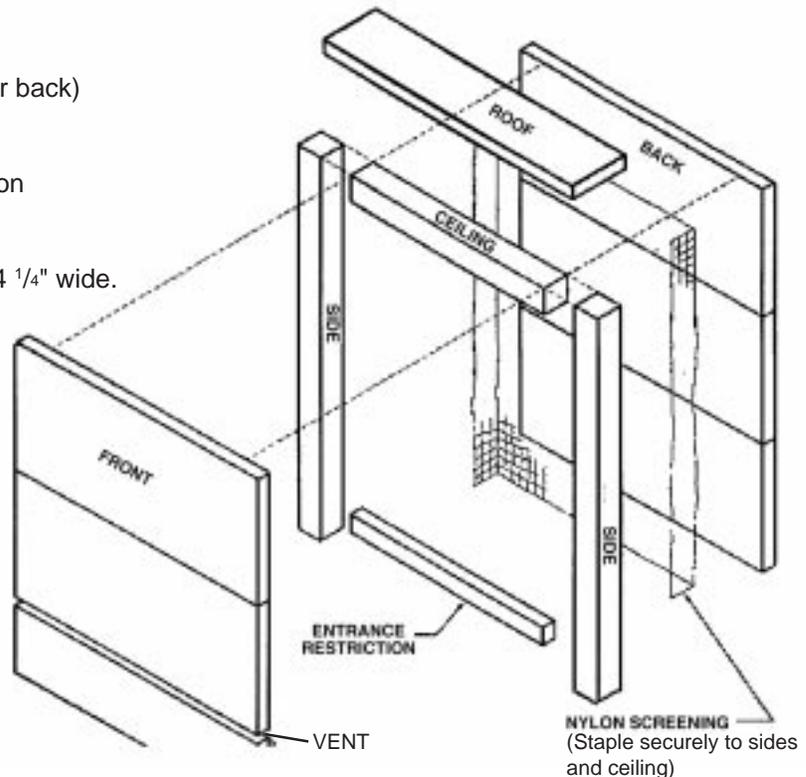
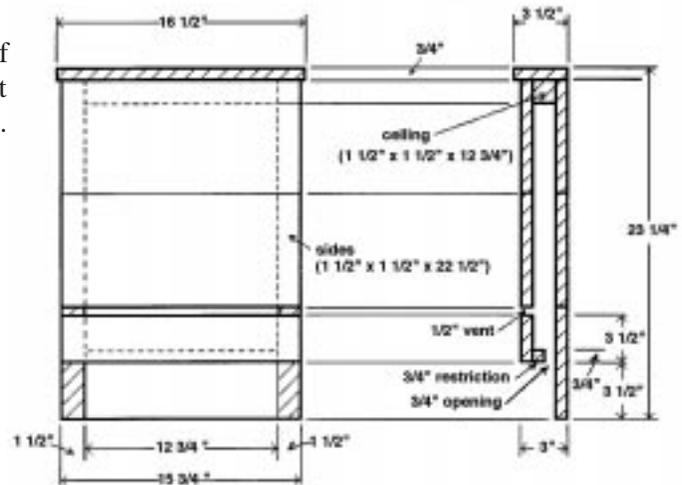
Lumber needed:

- 1" x 8" x 15³/₄"—5 pieces (2 for front, 3 for back)
- 1" x 4" x 15³/₄"—1 piece for front
- 1" x 4" x 16¹/₂"—1 piece for top
- 1" x 1" x 12³/₄"—1 piece for entry restriction
- 2" x 2" x 21³/₄"—2 pieces for sides
- 2" x 2" x 12³/₄"—1 piece for ceiling
- Piece of nylon screening, 19³/₄" long x 14¹/₄" wide.

Fold sides and top over ³/₄"

Note: the dimensions shown on the diagram are trimmed sizes, e.g., a 1" x 4" piece of lumber is actually ³/₄" x 3¹/₂"

FIGURE 3. Plans for a bat house



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File under: Wildlife

B-2 (Non-game animals)

Issued Aug. 2000 (3292000800 ST)



| [Introduction](#) | [Tenant Candidates](#) | [Living in Harmony](#) | [Exclusion Guidelines](#) | **Do-It-Yourself** ◀ |
 | [Bat Houses](#) | [Request for listing as an Excluder](#) | [Professional Excluders](#)

NOTE: For those residing in the United Kingdom, please note that bat exclusion without prior notification to the proper authorities is a punishable offense. The proper authorities to seek guidance from include: English Nature, Scottish Natural Heritage, The Countryside Council for Wales, or the Countryside and Wildlife Branch of the Department of the Environment in Northern Ireland.

Guidelines excerpted from:

Bats in Buildings: An Information and Exclusion Guide

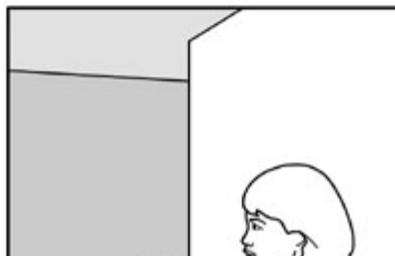
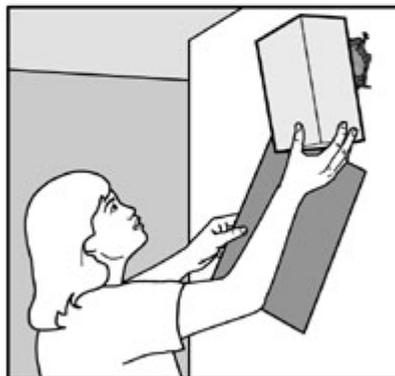
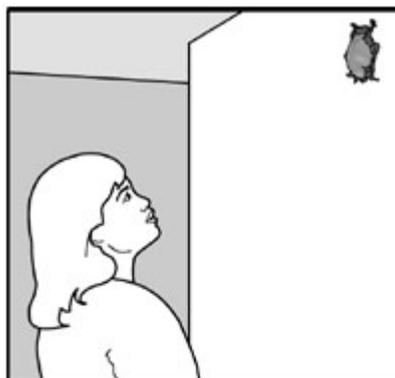
by

Barbara French, Laura Finn and Mark Kiser

Introduction

As primary predators of night-flying insects, bats play a vital role in maintaining the balance of nature. A single little brown bat can catch 1,200 mosquito-sized insects in an hour, and big brown bats are important predators of some of America's most costly crop pests. Cucumber beetles, June beetles, bark beetles, stink bugs, leafhoppers, cutworm moths, corn earworm moths, armyworm moths, termites, assassin bugs, ants, roaches, crickets, and grasshoppers are just some of the many pests known to be consumed by America's bats. Yet, bat populations are in alarming decline due to decades of unwarranted human fear and persecution.

As traditional roosts in trees and caves have been destroyed, many of North America's bats have been forced to seek shelter in man-made structures. An understanding of the habits of these beneficial animals can help solve problems that sometimes develop when bats roost in buildings. The following pages provide details about safe, effective methods for permanently evicting bats from buildings when necessary. These methods help ensure the safety of both humans and bats.



Accidental Intruders

What if you find a bat in your home?

On occasion, a solitary bat may accidentally fly into a home, garage or other building through an open door or window. Such incidents often involve lost youngsters whose primary goal is a safe escape. As long as no direct contact with the bat has occurred, it can be released outside. These bats will usually leave on their own if a window or door to the outside is opened while others leading to the rest of the building are closed. Bats are rarely aggressive, even if chased, but may bite if handled. As with any wild animal, bats should not be touched with bare hands, and anyone bitten should immediately seek medical consultation.

If a bat does not leave your home on its own, its exit can be hastened by waiting until it lands, and then covering it with a small box or other container. Slip a piece of cardboard between the wall and box, slide the bat into the box, then release the bat outside. You may also catch it by hand, using leather work gloves to avoid being bitten. Keep doors and windows to buildings closed, and window screens in good repair, to prevent bats from reentering.

Where do bats roost?

Bats may roost in attics, soffits, louvers, chimneys, under siding, eaves, roof tiles or shingles and behind shutters (see diagram). In sports stadiums and parking garages, bats sometimes roost in expansion joints between concrete beams. They can enter through openings as small as one-half inch in diameter (1.3 cm). Common points of entry include open windows or doors, broken or poorly-fitted screens, loose or missing shingles or tiles, places where flashing or boards have come loose and locations where pipes or wiring enter buildings. Openings often occur where walls meet the eaves at the gable ends of an attic, where porches attach to the main part of a house, or where dormers meet the roof. Other points of entry are associated with siding. For example, cracks and crevices are often created where siding forms corners, or at places where it meets windows, doors or chimneys (see diagram). Bats can sometimes be detected by the presence of black or brown stains from body oils or droppings around cracks or crevices formed by ill-fitting building materials. Bat droppings may also appear on walls, under porches or decks, or on floors beneath dilapidated ceilings. Bat droppings are dark and do not contain any white material. Although they may resemble small hard rodent pellets, bat droppings are soft and easily crushed, revealing shiny insect parts.



Common entry points on homes and buildings include corners, eaves and louvres.

Providing a safe exit for bats

There is little reason to evict bats from buildings where they are not causing a nuisance. However, bats should be prevented from entering human living quarters. This can be accomplished by inspecting the inside of a building for small openings through which bats could enter. All openings connecting the attic or other roosting areas to inside living quarters should be sealed, although entry points on the outside of the building should be left open, allowing bats to exit. Draft-guards should be placed beneath doors to attics; electrical and plumbing holes should be filled with steel wool, caulking or weatherstripping. Bats have small teeth for eating insects; they do not gnaw through wood or other building materials like rodents. Caulking, flashing, screening or insulation can be used to seal most openings on the inside. Expanding urethane foam products should not be used to seal cracks where bats are active, because they can become caught in it. Caulk should also be applied early in the day so that it has time to dry before bats emerge in the evening.

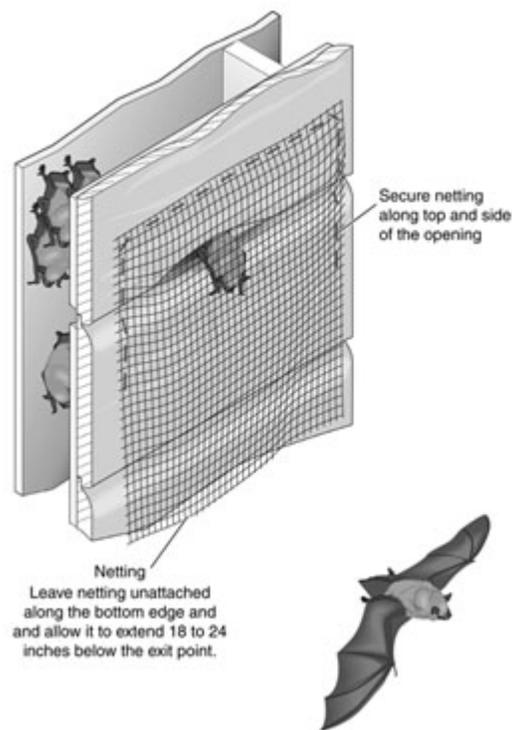
In some instances, noise or odors from large colonies of bats can become a nuisance. When bats must be evicted from a building, netting or tubes that function as one-way valves must be placed over the openings bats use to enter and exit. These one-way valves allow bats to leave, but not reenter the building. Valves may be constructed from lightweight plastic netting (1/6 inch-0.4 cm-or smaller mesh), or plastic pipes or tubes. These exclusion devices should be left in place for five to seven days to ensure all bats have exited. It is not appropriate simply to wait for bats to fly out at night and then seal openings. Not all of the bats leave at the same time, and some bats may

remain inside all night. Take weather conditions into consideration when deciding how long to leave the netting or tubes in place; there may be evenings (such as during storms), when no bats exit.

Bats often roost in buildings seasonally, including during maternity periods, and exclusions should not take place until young bats are able to fly. After the young are old enough to fly, all bats can be excluded. The maternity season begins as early as mid-April in the southernmost U.S., mid-June in the northern U.S. and Canada. Young bats are flying and exclusions can resume by late August. In late fall most house-dwellings bats either migrate to warmer climates or enter caves or abandoned mines to hibernate. However, a few species can hibernate in buildings, and in the mildest climates, they may even remain active year-round. If bats are present in cold regions during the winter, exclusions should be postponed until spring when they emerge to feed.

Exclusion is the **ONLY** effective solution for permanently removing bats from buildings. Trapping and relocating is ineffective since bats have excellent homing instincts and simply return, even when released at great distances. The use of pesticides against bats is illegal and counterproductive. Poisoning greatly increases the likelihood of bats coming into contact with people and pets.

Naphthalene, the active ingredient in moth balls, and ultrasonic devices are often promoted as bat repellents. However, ultrasonic devices are ineffective against bats, and to be effective, naphthalene must be used in such large quantities that it poses a significant health hazard to humans.



Using Netting to Exclude Bats

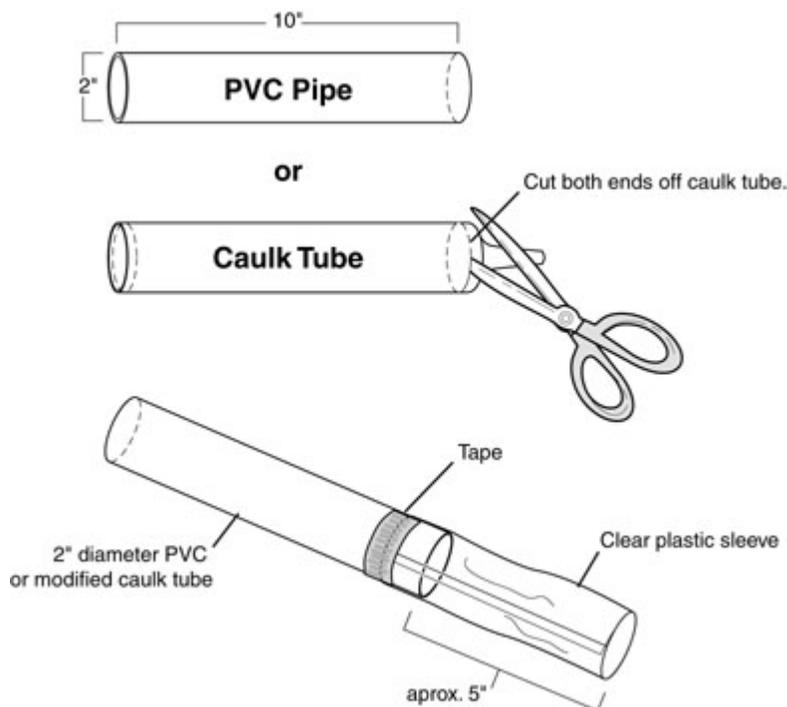
Bats sometimes enter buildings through openings on smooth surfaces of exterior walls or through louvers. In such cases, plastic or lightweight, flexible netting with 1/6 inch (0.4 cm) mesh or smaller, should be secured to the building along the top and sides of the opening as shown in the diagram. It should extend 18 to 24 inches (46 to 61 cm) below the bottom edge of the opening and should remain in place for a minimum of five to seven days to ensure all bats have exited. Then, openings should be permanently sealed with silicone caulking, caulk backing rod, hardware cloth, or heavy-duty netting. In some cases, sealing may require repair or replacement of old, deteriorated wood. When bats are using multiple openings to exit and enter, exclusion material

should be placed on each opening unless it can be determined with certainty that all areas used by the bats are connected. If so, some openings can be sealed as described above, and netting can be placed over the openings used by the most bats. Even when all roosting areas are connected, bats will sometimes refuse to use alternative exits. In this case, exclusion material must be installed over all exits. After this has been done, watch to make sure

the bats are able to exit safely. If they do not appear to be exiting, or appear to be having trouble doing so, make adjustments or add new valves as needed.

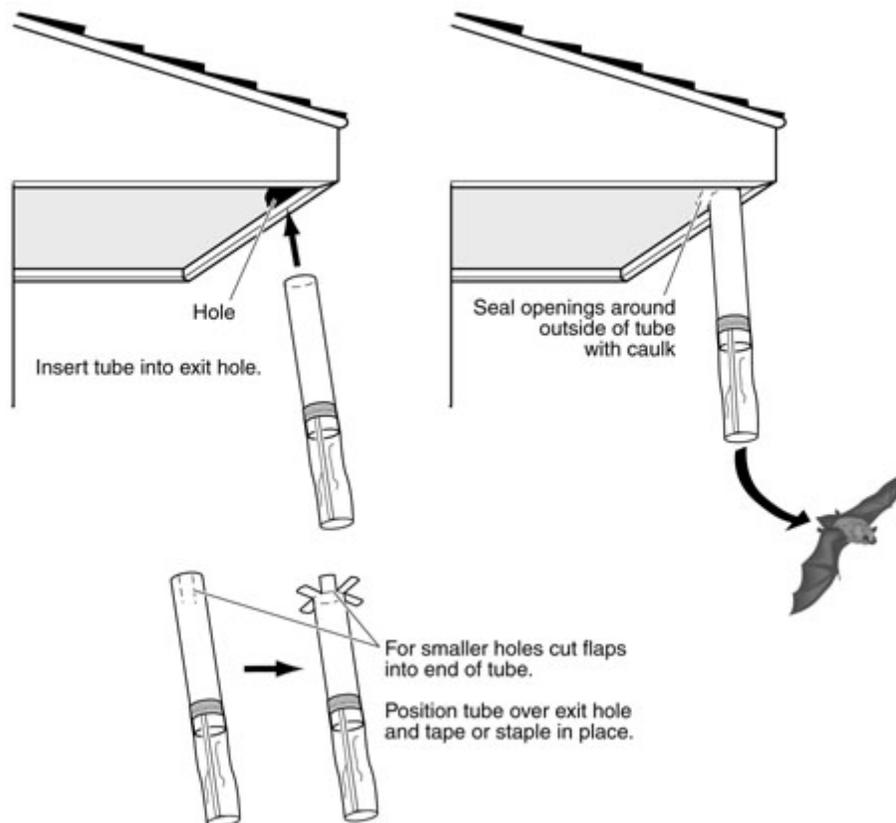
Using PVC pipe or Empty Caulking Tubes to Exclude Bats

There are a number of situations in which tubes work best as bat exclusion devices. Examples include openings used by bats on buildings constructed from materials that do not create smooth exterior walls, such as those found on brick or stone houses, and log cabins. Tubes also work best for holes located at corners where walls meet and on horizontal surfaces such as soffits. Exclusion tubes should have a 2-inch (5 cm) diameter and be approximately 10 inches (25.4 cm) in length. Exclusion devices can be made from PVC pipe or flexible plastic tubing. According to Laura Finn of Fly by Night, Inc., empty caulking tubes work well for this purpose. When using caulking tubes, both ends must be cut out. Use of a flexible plastic tube makes it easy to either squeeze one end of the tube so that it fits into a crevice, or cut one end of the tube into flaps that can be fit over an opening and stapled, nailed, or taped to the building (see diagram). Bats are unable to cling to the smooth surface of these tubes. Do not let the tube project more than 1/4-inch (6 mm) into the opening, ensuring that bats can easily enter the tube to exit. Caulking tubes must be thoroughly cleaned before use to prevent bats from sticking to wet caulk and because dried caulk creates a roughened surface, making it possible for bats to re-enter. Once the tube has been inserted over the hole, a piece of light weight, clear plastic can be taped around the end of the tube that projects to the outside (see diagram) to further reduce the likelihood of bats reentering, though this is typically not necessary.

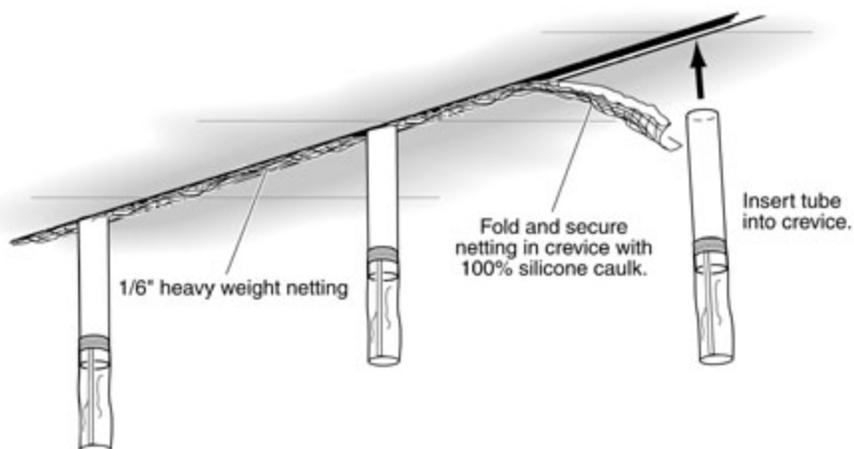


Plastic sleeves collapse on themselves, preventing bats from reentering once they have crawled out through the tube. After the tube has been inserted into or over the opening used by bats, any spaces between the outer rim of the tube and the building must be sealed shut. Be sure also to seal shut any other openings in the building that bats could use to reenter. Leave the tube in place for a minimum of five to seven days to ensure all bats have exited. After

the bats have been excluded, the tube should be removed and the opening permanently sealed.



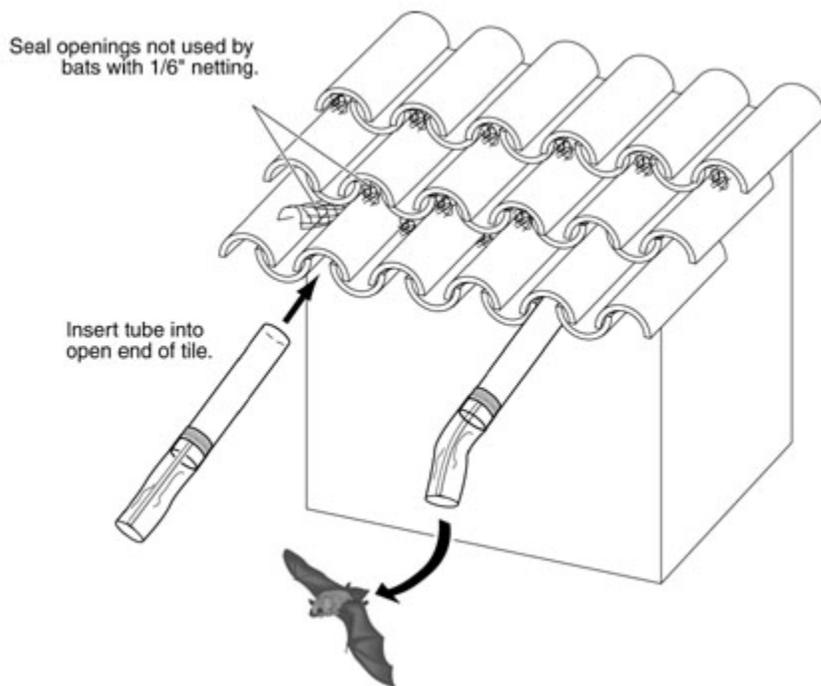
Some concrete parking garages have lengthy crevices used by bats. Multiple exclusion tubes will need to be placed every few feet along the length of each crevice; spaces between the tubes should be closed with heavy-weight (1/6 inch mesh) netting (see diagram). Fold the netting so that it fits into the crevice, and caulk it in place as shown in the diagram. The same procedure can be used in lengthy crevices created where flashing has pulled away from a wall.



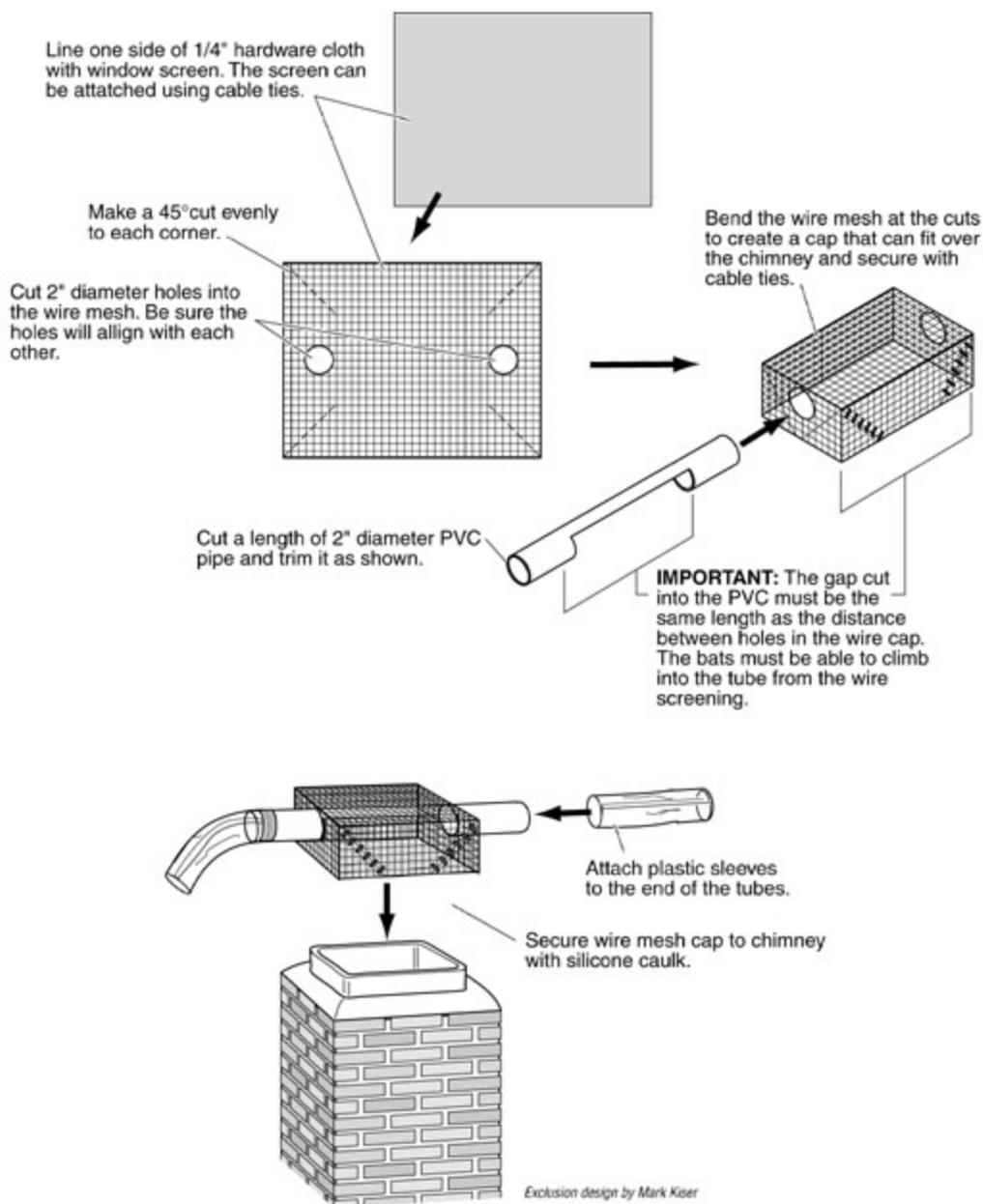
Plastic tubes also work best for excluding bats from under Spanish (clay) or concrete roofing tile. Bats typically enter through open ends of the tiles on the lowest row, or through openings created where tiles overlap one another. Observe the building when bats fly out in the evening to determine which

openings they use. Exclusion tubes should be placed in these openings (see diagram). Multiple exclusion tubes are often needed to exclude bats from problem roofs. Collapsible plastic sleeves should also be attached to the ends of the tubes. Heavy weight netting can be folded and inserted into openings where tiles overlap (see *diagram*).

Tiles are sometimes temporarily removed to replace a layer of tar paper. When this is done, a layer of coarse fiberglass batting can be put over the tar paper and under the tiles. Constantine (1979) found that the fiberglass layer repelled bats, although he recommended against use of batting within 6 inches (15 cm) of open tile ends to prevent birds from pulling it out for nesting material.



Bats may also enter a building through spaces beneath corrugated or galvanized roofing sheets. These roofs can be sealed with a variety of materials such as caulk backing rod during months when bats are not present, or after they have been excluded from a building by use of exclusion tubes.



Special modifications may be needed when bats roost in chimneys or in separations between chimneys and roofs. If bats are roosting inside the chimney, construct a wire cage from 1/4-inch hardware cloth lined with window screen. A section of PVC pipe can be cut and then inserted through holes cut into the sides of the wire cage (*see diagram*). Although bats are able to simply drop down and out of a vertically placed tube that extends below the roost, they are not able to grip the slick surface to crawl out if the tube extends upward above the roost. Therefore, the tubes should project horizontally or down. A collapsible plastic sleeve should be placed over the ends of all exclusion tubes used on chimneys. Once the bats have been excluded, a chimney cap should be installed.

Bats Roosting on Porches at Night

Bats sometimes roost on porches or under overhangs briefly during the night while they digest the insects they have eaten. Non-toxic aerosol dog or cat repellents may be used to discourage bats from roosting in these areas. The spray should be applied by day when bats are not present (Aerosol repellents are not an adequate substitute for exclusion in the case of day roosts and

should never be applied when bats are in a roost.) Mylar balloons or strips of aluminum foil hung from the porch ceiling and allowed to move in the breeze may also discourage bats from roosting in that area.

Bat Houses

It's always a good idea to provide bats with a new place to roost. For information on building or purchasing bat houses visit the North American Bat House Project Web site at www.batcon.org/bhra. You can also purchase *The Bat House Builder's Handbook* or the *Building Homes for Bats* video through the [BCI catalog](#).

NOTE: For those residing in the United Kingdom, please note that bat exclusion without prior notification to the proper authorities is a punishable offense. The proper authorities to seek guidance from include: English Nature, Scottish Natural Heritage, The Countryside Council for Wales, or the Countryside and Wildlife Branch of the Department of the Environment in Northern Ireland.

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Guidelines for Excluding Bats

Our goal is to promote exclusion methods that ensure the safety of both bats and people. We understand that differing architectural structures and/or climatic conditions may require modification of the guidelines given below. Please feel free to share your ideas about these issues with us when submitting your letter of commitment. We want to encourage you to participate in the "Bats In Buildings" program and look forward to receiving your input.

All BCI recommended exclusion professionals should be licensed by the states in which they work, be insured, and use only approved exclusion methods. They should also provide the property owner with a guarantee and list of references. All written materials should be accurate and scare tactics should be avoided.

One-way devices constructed from light weight polypropylene netting (<1/6" mesh), plastic sheeting, or tube-type excluders are the preferred methods for evicting bats from buildings. Excluders should be placed at all active entry points and should remain in place for at least 5 to 7 days. These devices should be removed after the bats have been excluded, and then exclusion points should be sealed with silicone caulking, caulk backing rod, hardware cloth, or heavy duty polypropylene mesh. In some cases, sealing may require repair or replacement of old, deteriorated wood. BCI strongly recommends that exclusion professionals bat-proof the entire building and avoid spot treatments. Moving bats from one corner of a building to another does not solve the problem and may require that further exclusion work is carried out at some time in the future, further disturbing the bats and the property owner.

Please note that simply waiting until the bats have flown out at night and then permanently sealing entrances shut without the use of exclusion devices, is not approved by BCI. This method often traps some bats inside the building. BCI also discourages the use of 'permanent netting' in most situations. Aerosol dog and cat repellents may discourage bat use of a particular roosting spot for periods of up to several months. They have been used effectively to prevent bats from night-roosting above porches. The spray should be applied by day when bats are not present. Aerosol repellents are not an adequate substitute for exclusion in the case of day roosts and should never be applied when bats are in a roost. For night roosts, we also recommend the use of Mylar balloons or strips of tin foil hung from roosting areas and allowed to move in the breeze.

Maternity season for bats in the US and Canada can range from 1 May through 31 August, although pups have been seen as early as late April in some instances. Eviction of bats, or any activity that directly affects their roosting area, should occur only prior to or after the maternity season, when

young will not be trapped inside, creating additional problems.

Some bats hibernate in buildings during the winter months. Winter exclusions should be performed only if it can be determined that no bats are hibernating in the building. If bats are present during the winter months, exclusions should be postponed until spring temperatures are warm enough for deciduous plants to leaf out and insects to again be abundant.

Ultrasonic devices, chemical repellents, and smoke are not approved by BCI as effective methods to evict bats from buildings. In addition, canned spray foam is not an approved sealant for cracks and holes in most situations. It is not only unattractive, but can result in the death of bats that come into contact with it. This product should never be used when bats are still present.

Traps and relocation are not BCI approved exclusion techniques. Removing large numbers of bats from a building may seem impressive to a customer, but is unlikely to be effective. Traps can be fatal to bats if left unattended or if overcrowding occurs. Bats have excellent homing instincts making relocation attempts unlikely to succeed. They will simply attempt to return to the original capture area upon release. Capturing bats at an exclusion site is not encouraged, although capturing a single bat for species ID or removal of an individual bat from a living space are exceptions to this rule.

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Date of last update: 05-23-01



Facts on the Fly!

ANSWERS TO QUESTIONS ABOUT BATS AND RABIES

What is rabies, and how is it transmitted?

Rabies is an infectious viral disease that invades the central nervous system of humans and other warm-blooded animals. A wide variety of mammals can contract or transmit the disease, but it is most often noticed in dogs, cats, foxes, raccoons, skunks, coyotes, bats, and livestock. Worldwide, more than 30,000 humans die of rabies each year, 99% of these cases resulting from contact with dogs. In the United States, due to highly successful dog vaccination programs, transmission from dogs is now rare, eliminating the vast majority of human cases.

Rabies is nearly always transmitted by a bite, though non-bite exposures can result from contact between infected saliva or nervous tissues and open wounds or the mucous membranes of the eyes, nose, or mouth. Bites during careless handling are the primary source of rabies exposure from bats.

Rabies virus has not been isolated from bat blood, urine or feces, and there is no evidence of air-borne transmission outside of caves. Two cases of aerosol transmission were reported in the 1950's in Texas caves that support very unusual environments. However, no similar cases have occurred since, despite the fact that many thousands of people explore bat caves each year.

Do large bat populations lead to increased incidence of rabies transmission to humans?

The largest urban bat populations consist almost exclusively of colonial species, and there is no evidence linking them to increased transmission to humans. Tens of thousands of people, each summer, closely observe the emergences of 1.5 million Mexican free-tailed bats at the Congress Avenue Bridge in Austin, Texas, and in over 20 years, no one has been attacked or harmed. In fact, though Austin, San Antonio, and several other Texas Hill Country towns likely support the highest bat densities in America, they have recorded no human cases of bat-transmitted rabies.

Are bats likely to cause rabies outbreaks in other wildlife or in domestic animals?

There is no evidence that rabies from bats has triggered outbreaks in other animals. It occasionally does spill over into other species, causing individual animals to

die, but even this is apparently rare. Despite the fact that numerous carnivores gather to feed on the 20 million Mexican free-tailed bats at Bracken Cave, Texas, no outbreaks of rabies are known from this source. No transmission from bats to dogs is known to have occurred, though rare cases of transmission to cats have been documented. The presence or absence of bats is irrelevant to the fact that all dogs and cats should be vaccinated.

What can be done to prevent rabies transmission to humans?

By far the most important prevention is dog and cat vaccination. Also, children should be especially warned never to handle any unfamiliar animal. Explain that wild animals that can be touched may be rabid and dangerous. Ninety to 95% of sick bats are not rabid, but taking a careless chance on being bitten could prove fatal. Any animal bite should be reported immediately to a family physician or public health professional for evaluation as a possible rabies exposure.

The U.S. Centers for Disease Control and Prevention recommend pre-exposure vaccinations for people who are at high risk of exposure, such as rabies researchers, veterinarians, field biologists, and animal rehabilitators. Vaccines currently available include Imovax (HDCV--a human diploid cell vaccine) and Rabavert (PCEC--a purified chick embryo cell vaccine). Vaccinations are administered on days 0, 7, and 21 or 28. Dosage and route of administration varies depending upon the vaccine used. For those at continued risk of exposure to rabies, a booster dose of vaccine or serology may be necessary at intervals of 6 months to 2 years.

What are the symptoms of rabies?

Rabies causes fatal inflammation of the brain or spinal cord. Symptoms most often develop about 10 days to seven months after infection (some cases take years to develop), and death follows 2-12 days after symptoms appear. Early symptoms in humans include pain, burning, and numbness at the site of infection. Victims complain of headaches, inability to sleep, irritability, muscle spasms and difficulty swallowing. Convulsions may occur, followed normally by death.

Rabies is often referred to as hydrophobia because

victims fear swallowing. Drinking or eating can bring on muscle spasms of the throat. The fear of swallowing also accounts for saliva accumulation referred to as "foaming" at the mouth. Infected animals may be either agitated and aggressive or paralyzed and passive. Dogs, cats, and other carnivores often become aggressive and try to attack humans and other animals, but bats are typically passive. Bats normally bite only in self-defense if handled, and aggressive behavior is rare even when rabid.

How should potential exposures to rabid bats be evaluated and treated?

Any mammal that bites a human should be tested for rabies as soon as possible, and post-exposure treatment should begin immediately unless it is confirmed negative. Bat bites are typically felt and detected at the time. Visual examination for bite marks is unreliable. If visible at all, bites may appear only as a single tiny puncture or scratch. Most punctures are a millimeter or less in diameter, and most bat-inflicted scratch marks are no more than a few millimeters long. Extenuating circumstances can make detection difficult. If a lost or sick bat hides in bedding, it could be inadvertently pinched during one's sleep, bite, and leave without detection. Also, people hauling in firewood or moving outdoor lumber piles may accidentally poke and be bitten by a bat without noticing. These are obviously remote possibilities, though wearing gloves when moving wood piles could provide protection.

If a young child or a mentally incapacitated person is found alone with a bat in the same room and the possibility of a bite cannot be eliminated, post-exposure treatment should be considered unless prompt testing of the bat can rule out infection. When questioning about possible exposure, it is essential first to calm fears of painful shots. For the majority of patients, the post-exposure shots are less painful than tetanus vaccinations. Also, persons who wake up with a bat in the same room where they have been sleeping are advised to submit it for testing, especially if the bat is unable to fly or seems weak.

What is the recommended treatment for a known or suspected rabies exposure?

Modern rabies treatment is highly effective and relatively painless. Post-exposure rabies prophylaxis should begin as soon after exposure as possible. According to the Centers for Disease Control and Prevention, exposed humans who have not previously been vaccinated against rabies should receive an initial intramuscular injection of Human Rabies Immune Globulin (HRIG), twenty international units per kilogram body weight or nine international units per pound of body weight in total. If anatomically feasible, the full dose of HRIG should be thoroughly infiltrated in the area around and into the wound(s). Any remaining volume should be administered intramuscularly at a site distant from vaccine inoculation. The HRIG is followed by a series of five 1.0 ml of either Imovax (HDCV--a Human Diploid Cell Vaccine), or Rabavert (PCEC--a purified chick embryo cell vaccine). The vaccination series is given on days 0, 3, 7, 14, and 28. Vaccines are administered intramuscularly in the deltoid region. Persons who have previously received rabies vaccination should receive two 1.0 ml IM doses of either of the three vaccines listed above, one on day 0, the second on day 3.

Where can the vaccine be obtained?

Rabies post-exposure vaccinations can be obtained from hospitals, emergency clinics, and some doctors. If unavailable locally, vaccines and human rabies immunoglobulin (HRIG) can be obtained as follows: 1) Imovax (HDCV) and Imogan (HRIG) from Pasteur Merieux Connaught at 1-800-822-2463; 2) Rabavert (PCEC) from Chiron at 1-800-244-7668; and 3) Bayrab (HRIG) from Bayer at 1-800-288-8370. Additional information is available from the Division of Viral and Rickettsial Diseases, U.S. Centers for Disease Control and Prevention at (404) 639-1075 during working hours, or at (404) 639-2888 on nights, weekends, or holidays.

Additional References

- Bats and Rabies: A Public Health Guide, A Special Publication of the U.S. Department of Health and Human Services. 1998.
- Brass, D. 1994. *Rabies in Bats: Natural History and Public Health Implications*. Livia Press, Ridgefield, CT, 352 pp
- Constantine, D.G. 1988. "Health Precautions for Bat Researchers". Pp. 491-528, *Ecological and Behavioral Methods for the Study of Bats*, (T.H. Kunz, ed). Washington D.C., Smithsonian Institution Press, 533 pp.
- Tuttle, M.D. 1995. "Saving North America's Beleaguered Bats". *National Geographic*, 88(2):37-57.
- Tuttle, M.D. 1997. *America's Neighborhood Bats*. Rev. ed. Austin: Univ. of Texas Press, 98 pp.

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Facts on the Fly!

DEALING WITH UNWANTED GUESTS

For more detailed info on exclusion techniques you can do yourself (including an instructional video) visit the following page on the BCI web site: <http://batcon.org/index.php/bats-in-buildings.html>

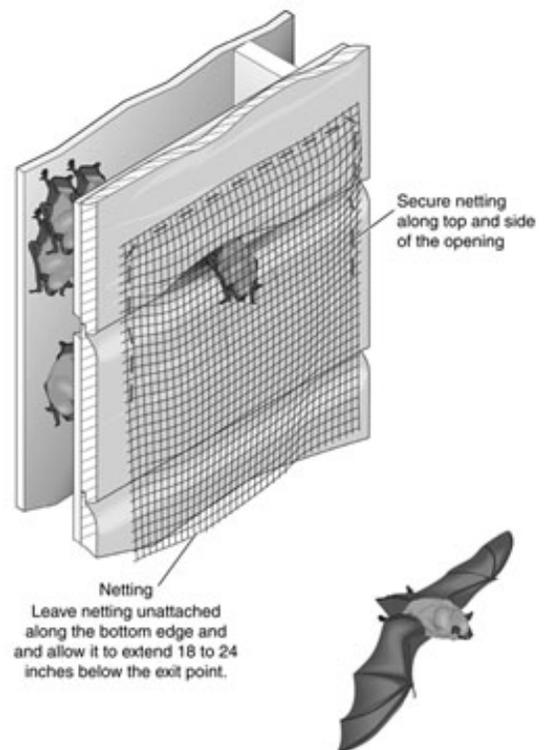
Have you encountered a stray bat flying around in your house? Bats that fly into human living quarters are usually lost youngsters whose primary goal is a safe escape. They often will leave on their own if a window or door to the outside is opened while others leading to the rest of the house are closed. Bats are not aggressive, even if chased, but may bite if grabbed. As with any wild animal, bats should not be handled with bare hands. An exit can be hastened by catching the bat in flight with a hand net (swung from behind), or when the bat lands, covering it with a coffee can and slipping a piece of cardboard over the opening, and then simply releasing it outside. Or you may also catch it by hand, using leather work gloves to avoid being bitten.

Excluding a Colony from Your House

Bats can be excluded from living quarters by covering chimneys and vents with half-inch hardware cloth screens, by installing draft guards beneath doors, and by sealing any other possible access routes, especially around screen doors, windows and plumbing. Bats potentially can enter holes as small as 3/4" in diameter or 3/8" by 7/8". They do not chew insulation or otherwise make new holes. Their entries can be plugged with silicone caulking, steel wool, or temporarily even with tape. If a large bat colony must be evicted from a wall or attic, careful observations should be made at dusk to find entry holes (also sometimes recognizable by stains around used holes or crevices or by droppings beneath). The bats must emerge each summer evening to feed. Once roost entrances have been located, the bats can be excluded, though this should not be attempted when flightless young may be present (anytime from May through August in the U.S.). Starved young could create a serious odor problem, not to mention needless cruelty.

Most bat species leave in winter, permitting exclusion in their absence. However, some bats hibernate in buildings. When this is the case, or when one does not wish to wait for winter, there is a relatively simple exclusion technique that can be used after young are flying but prior to the winter months. Inexpensive light-weight polypropylene

netting* with a mesh-size of 1/6" or smaller is preferred, can be obtained in quantity to cover areas of nearly any size. It can be hung during daylight hours above areas where bats emerge, using duct tape or staples. A strip of netting at least two feet wide, hung one to two inches in front of bat exit holes, and extending at least two feet below and to the side of exit points (see illustration), will allow the



bats to emerge, but later they will be unable to find their way back. Thus the netting acts as a simple one-way excluder until repairs can make the exclusion permanent. A sheet of clear, heavy-weight plastic (available at any hardware store) will have the same affect. The netting (or plastic) should be left in place for 5 to 7 days to assure that all bats have left the roost.

* Netting available from: Industrial Netting
<http://www.industrialnetting.com> (request 1/4" or 1/6" mesh size, order OV 3018 or OV 7100).

Other Methods

BCI does not condone the use of traps for removing bats from buildings.

Harmless repellent devices would seem ideal, but none are known to be effective. The U.S. Environmental Protection Agency once fined a Chicago manufacturer \$45,000 for misleading claims involving an ultrasonic device. All ultrasonic sound generators thus far tested by reliable bat experts have proven ineffective and some may endanger people or even attract bats.

Naphthalene flakes (moth balls) are no more effective. Their primary usefulness is in generating repeat business for the pest control industry. To be at all effective, they must evaporate rapidly, requiring frequent replacement.

Aerosol dog and cat repellents may discourage bat use of a particular roosting spot for periods of up to several months. They have been used effectively to prevent bats from night-roosting above porches. The spray is applied by day when bats are not present. Aerosol repellents are not an adequate substitute for exclusion in the case of day roosts and never should be applied when bats are in a roost. In many cases, suspending 2" wide by 7-10" long strips of aluminum foil or helium-filled Mylar balloons at a roost will deter bats.

Professional Bat Excluders:

For a list of reliable pest control operators in your area, visit the Bats and Buildings page at www.batcon.org or contact the "Bats in Buildings" coordinator at batsinbuildings@flybynightinc.org or call 407-414-2142 and ask for Laura Finn.

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Poisons used against bats pose serious health hazards to humans and are not effective in eliminating bat colonies. For this reason, there are currently no poisons or chemicals licenced for use against bats. Furthermore, it is a direct violation of federal law to use a chemical in any way other than that which it is strictly intended. In most cases, the only safe, permanent solution is exclusion.

Do Bats Present a Disease Risk?

Like most mammals, an occasional bat may contract rabies, but even those that do are typically non-aggressive, biting only in self-defense if handled. According to the U.S. Center for Communicable Disease guidelines, a rabies exposure requires a bite or contact with an open wound or mucous membranes (eyes, nose, or mouth) with a rabid animal's saliva or nervous tissue. Transmission from an animal to a human through the air has never been recorded outdoors or in buildings, though there are two cases which occurred under extremely unique conditions inside caves. There is no evidence of transmission through contact with urine or feces. Thus the odds of being harmed by a bat are extremely remote for those who simply do not handle them. If bitten, a safe and painless vaccine is available.

A fungal disease with flu-like symptoms, called histoplasmosis, can be contracted from breathing dust stirred up from either bird or bat droppings. It is uncommon in attics and can be avoided by simply not inhaling dust from droppings. Those removing large accumulations of droppings should always use a properly fitted dust respirator capable of filtering particles as small as two microns in diameter.

There are no records of disease transmission to humans or pets from bat parasites. These strongly prefer their bat hosts and seldom bite other animals.



Facts on the Fly!

ANSWERS TO QUESTIONS ABOUT BATS AND PUBLIC HEALTH

How dangerous are bats?

Bat rabies accounts for approximately one human death per year in the United States. Thus, some people consider bats to be dangerous. Nevertheless, dogs which often are considered "man's best friend," attack and kill more humans annually than die from bat rabies in a decade. Statistically speaking, pets, playground equipment, and sports are far more dangerous than bats. Clearly, bats do not rank very high among mortality threats to humans. Nevertheless, prudence and simple precautions can save lives.

Which bat variances of the rabies virus have been transmitted to humans?

Rabies virus variances associated with six of the 47 bat species living in the continental United States have been transmitted to humans. These include the silver-haired bat (*Lasionycteris noctivagans*), the Mexican free-tailed bat (*Tadarida brasiliensis*), the big brown bat (*Eptesicus fuscus*), the eastern pipistrelle (*Perimyotis subflavus*), and two species that were not positively identified. These are suspected of having been western (*Myotis ciliolabrum*) and eastern (*M. leibii*) small-footed myotis.

Are there other diseases to be concerned about from bats?

The only other disease of public health concern in the United States is histoplasmosis, which is caused by a fungus, *Histoplasma capsulatum*. This fungus lives in soil enriched by bird or bat droppings. Human infection is common in and adjacent to the Ohio and Mississippi River drainages where warm, humid climates favor fungal development. The fungus is rare in dry western and cool northern climates. It can be present, but is uncommon in dry, hot attics of buildings. Infection is caused by inhalation of air-borne spores in dust enriched by animal droppings. The vast majority of histoplasmosis cases in humans are asymptomatic or involve no more than flu-like symptoms, though a few individuals may become seriously ill, especially if exposed to large quantities of spore-laden dust. The disease can be avoided by not breathing dust suspected of being enriched by animal feces. Risks from bats are no different from those

of birds.

Are there reasons for conserving bats?

Most bats are valuable allies, well worth protecting. Worldwide, they are primary predators of vast numbers of insect pests that cost farmers and foresters billions of dollars annually and spread human disease. In the United States, little brown bats often eat mosquitoes and can catch up to 1,200 tiny insects in an hour. An average-sized colony of big brown bats can eat enough cucumber beetles to protect farmers from tens of millions of the beetle's rootworm larva each summer. Large colonies of Mexican free-tailed bats eat hundreds of tons of moth pests weekly. Bats play key roles in keeping a wide variety of insect populations in balance. Yet, they rank as North America's most rapidly declining and endangered land mammals. The largest known cause of decline is exaggerated human fear and persecution.

Is it safe to put up bat houses?

Statistically, it's safer than owning a dog or planting flowers. Flowers attract bees whose stings account for far more human fatality than bats. Just banning bicycles or swimming pools would be hundreds of times more effective in saving lives, but how safe do we really want to be?

Which kinds of bats are attracted to bat houses, and what are the risks and benefits?

In the northern United States and Canada, little brown and big brown bats are the most frequent bat house users. No one has been known to have contracted a disease from little brown bats, while only three have been known to have contracted rabies from big brown bats in all of U.S. history. In southern areas, the two most frequent bat house users are twilight bats (*Nycticeius humeralis*) and Mexican free-tailed bats. The twilight bat has a perfect safety record. Only eleven humans have been known to have contracted rabies from free-tailed bats, making them far safer than having dogs in a neighborhood. Children should be warned to leave bats alone, just as they learn to leave bees and unfamiliar dogs alone. Bats that live in our yards, in addition to eating pests, serve as natural insect repellents. Many yard pests,

especially moths that attack gardens, lawns, and shrubs, can hear bats from over 100 feet away and attempt to avoid them by leaving the area.

Should bats be tolerated or encouraged in our neighborhoods?

There are clear benefits to sharing our neighborhoods with bats, but as with any wild animal, they never should be tolerated inside our living quarters. Most bats that enter living areas are lost youngsters with no greater interest than a safe escape. They can be chased out through an open door or window or caught in a butterfly net, a leather gloved hand, or a coffee can slowly placed over them while a piece of cardboard is slid between the bat and wall. Rabies testing is expensive and unnecessary unless a possible rabies exposure has occurred.

In the vast majority of cases, exclusion of bats from human living quarters is simple, inexpensive, and can be accomplished by the homeowner with minimal instruction. Exclusion of bats from an entire building is also feasible in most cases, though professional advice may be needed. More than 80% of bat colonies living in buildings go undetected by human occupants, but large colonies can cause odor or noise problems that justify exclusion. Many people simply exclude bats from entering living quarters while permitting them to remain in outer walls or in unused attics.

When bats must be entirely excluded from a building, providing an adequate-sized bat house nearby can resolve a nuisance without sending it to a neighbor. Without such an alternative, evicted bats will attempt to move into a neighbor's home, or sicken and die, increasing the probability of being picked up by children or pets.

How can human living quarters be protected against bat entry?

Most bats that wander into human living quarters enter through a loose-fitting door to the outside or an attic, an open window, an unscreened chimney, or a gap

in an outside wall. They must have spaces at least 3/4-inch in diameter or 3/8 by 7/8 of an inch to enter. A room by room search will quickly reveal such possible entry points. Holes or crevices are easily plugged with steel wool or silicone caulking. Chimneys can be covered with half-inch hardware cloth screening, and loose fitting doors may be fitted with draft guards. Unlike rodents, bats do not chew holes, so are easily excluded. Even when bat colonies cannot be excluded from walls or attics, they can be kept out of human living areas.

Are there risks of people overreacting to news of rabies in bats?

Rabies incidents involving bats are often distorted during media reporting. When risks are not kept in perspective, panicked people overreact in ways that increase rather than decrease the risk of rabies. Attempts to poison or exclude bats from buildings by inappropriate methods can dramatically increase human contact, as sick or homeless bats scatter to exposed positions throughout an entire neighborhood.

Efforts to kill or evict bats invariably center on colonial species. Silver-haired bats and eastern pipistrelles, the two bat variances of the rabies virus most implicated in transmission to humans, overlap big and little brown bats in both roosting and feeding behavior. In urban settings, silver-haired bats are apparently less able to compete with the more colonial species and are scarce. When frightened humans declare war on bats, they may actually help these species by reducing their primary competitors.

The public needs to recognize the inescapability and desirability of coexisting with bats, as well as how to minimize contact and associated risks. Collaboration between bat researchers, conservationists, public health and animal control officials is essential to progress.

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Facts on the Fly!

THINGS YOU CAN DO TO PROMOTE BAT CONSERVATION

You don't need to travel far or have a degree in biology to help bats. You can make a difference for bat conservation by working on local projects. Every community has unique needs. These suggestions may apply to the bats where you live.

Much more information and downloadable publications are available at BCI's website: www.batcon.org.

Things EVERYONE can do for bats:

After centuries of myths and misunderstandings, bats have acquired a poor public image. You can help counter these myths by raising public awareness about bats in your community. Because bats are mammals, they are susceptible to the rabies virus, making sick individuals a possible risk to people who know little about them. Due to fears that are often greatly exaggerated, many bats are needlessly killed. You can help save bats from misguided persecution by:

- **Joining** Bat Conservation International and obtaining the most up-to-date information about bats and bat conservation. To join, visit www.batcon.org.
- **Giving** bat lectures to local schools, nature centers, zoos, museums or libraries. Presentations and videos are available through BCI's catalog.
- **Donating** books and other educational materials about bats to local libraries, resource centers or schools.
- **Writing** a positive article about bats for your local newspaper (especially for Halloween).
- **Helping** people safely remove stray bats from living quarters. This can be done easily by covering the bat with a coffee can when it lands and slipping a piece of cardboard between the wall and the can. Then the bat can be released outside. Do not attempt to handle bats without gloves, as they may bite in self-defense.
- **Answering** questions or directing people to BCI during public health scares.
- **Educating** local pest-control operators about humane exclusion techniques. Exclusion is the only effective way to remove a nuisance colony of bats from a building. Poisons, naphthalene flakes and harmless repellent devices do not deter bats and may actually harm humans.
- **Providing** facts about bats and rabies to local health

departments, veterinarians and personal physicians. To obtain detailed information about bats and public health issues, visit www.batcon.org.

- **Installing** a bat house as part of an exclusion project or just to bring bats into your backyard. BCI's website provides designs and detailed instructions for building and installing bat houses. You can also order a ready-made bat house, the *Bat House Builder's Handbook* or the *Building Homes for Bats* DVD from BCI's online catalog.
- **Learning** more about the bats in your state by visiting the 'Species Profiles' section of www.batcon.org.
- **Volunteering** to advocate for bats in your community.

Things TEACHERS and STUDENTS can do for bats:

Bats rank among the world's most diverse and fascinating mammals, yet few people know anything about them. People must first understand bats before they can really care about their survival. You can increase bat awareness by:

- **Teaching** a unit on bats. Exciting curricula aids are available through BCI.
- **Learning** more about the bats in your state by visiting the 'Species Profiles' section of www.batcon.org.
- **Researching** specific bat-related topics. Archived issues of BATS magazine issues can be found at www.batcon.org.
- **Organizing** a bat-appreciation day at your school and educating other students about the importance of bats.
- **Promoting** the "Look, but do NOT touch" approach of respecting wild animals.
- **Adopt-A-Bat** for the classroom. Students can take part in conservation efforts, learn about a bat species of their choice and receive a certificate and photo of the bat.

Things LANDOWNERS can do for bats:

Bats are losing their natural habitats around the world because of increasing land development, agriculture and deforestation. In many cases, bats can adapt to such changes if their needs for water, insect prey and roosts are taken into consideration. To mitigate the loss of natural roosts, many people also now provide bats with alternative roosts, such as bat houses. All this and more is available online at www.batcon.org. You can help by:

- **Planting** or preserving native vegetation that attracts and supports a diversity of non-pest insects for bats to feed on.
- **Decreasing** disturbance and destruction of cave and abandoned-mine roosts via education, fencing or gating.
- **Protecting** roosting bats in abandoned buildings or providing artificial alternatives when such buildings must be torn down. BCI can provide suggestions for construction of artificial roosts.
- **Leaving** snags in forests and woodlands to serve as natural homes for wildlife. Bats often roost in tree hollows, under loose bark and in old snags, which are frequently removed.
- **Supplying** open water resources where bats can drink on the wing. Even a pool just ten feet by five feet can be a big help to bats in need of a drink if the approaches are not obstructed by vegetation.
- **Constructing** and **installing** a bat house. BCI's website provides designs and detailed instructions for building and installing bat houses. You can also order a ready-made bat house, the *Bat House Builder's Handbook* or the *Building Homes for Bats* DVD from our online catalog.
- **Modifying** a bridge to serve as a home for bats by working with your local highway department.

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BAT CONSERVATION INTERNATIONAL'S BAT HOUSE PROJECT

Bat Houses? Here's How!

Thank you for your interest in bat houses. Many people are discovering the benefits and wonder of bats by providing new homes for these fascinating mammals. We have learned much about the roosting needs and preferences of bats, and we share the latest information through BCI's website, free electronic newsletter, and *The Bat House Builder's Handbook*. Homeowners, farmers, organic gardeners, foresters and recreation managers around the world are installing bat houses for education and pest reduction. Please join us by providing an acceptable home for our beneficial bats and helping us improve the design, location and use of bat houses. Thanks again for your interest.

Answers to Frequently Asked Bat House Questions

Will attracting bats to bat houses in my yard increase the likelihood that they will move into my attic or wall spaces?

No. If bats liked your attic or wall spaces, they probably would already be living there.

How many bats can potentially occupy my bat house?

A single-chamber house can shelter 50 bats, while a larger multi-chamber design can attract colonies of 200 or more bats.

How can I determine the likelihood of attracting bats?

Throughout most of the United States and much of Canada there are occupied bat houses being used by one of North America's many crevice-dwelling bat species. Wherever bats live, they must find enough insects to eat, largely explaining their preference for roosting near aquatic habitats. The closer you live to cave or mine hibernating sites the better, and the existence of bat colonies in nearby buildings and bridges also increases your chances.

Why might bats not be attracted to my bat house?

The most frequent cause of failure is inappropriate exposure to solar heating. Alternatively, bats may not be able to live in your area due to heavy pesticide use, inadequate food supply or lack of available caves and mines within 50 to 100 miles (80 to 160 km). So far, we are unaware of large areas of North America (except for hot desert lowlands) that cannot attract bats.

If I have bats living in my attic, but would prefer that they occupy a bat house, what should I do?

Attics and other parts of buildings often provide ideal bat roosting sites. In most cases, bats will not voluntarily move from an attic. In such cases, alternative roosts ideally should be provided several months or one season before the desired move. The bats should be evicted from the attic at a time in the early spring or fall when flightless young are not present. Eviction is often easily accomplished. Watch to see where the bats emerge at dusk. Using 1/6" (4 mm) or smaller plastic mesh, bird netting or clear, heavy plastic, hang a large enough piece over the emergence point, extending a foot (30 cm) below and to each side of the exit. Secure the net in place so that it hangs free an inch (25 mm) or so away from the building. It will act as a one-way valve, permitting exit, but closing when bats land on it to return. For more information about bat eviction, please refer to the Bats in Buildings Project on BCI's website (www.batcon.org).

How effective are bats in controlling insects?

As primary predators of night-flying insects, bats play a key role in the balance of nature, consuming vast quantities of insects, many of which are costly agricultural and yard pests. Furthermore, many insects avoid areas where they hear bats.

Will having bat houses in my yard interfere with attracting birds?

No. They rarely compete for food or space.

Will bat droppings pose a threat to my family?

No more so than bird or cat droppings would. You should avoid inhalation of dust associated with animal feces of any kind.

What are the odds that a sick bat will endanger my family with rabies?

Only 14 people in more than 50 years have contracted rabies from North American bat species that commonly live in bat houses. Like all mammals, bats can contract rabies, though very few do (less than half of one percent). Unlike many other animals, even rabid bats rarely become aggressive. They quickly die from the disease, and outbreaks in their colonies are extremely rare. The odds of being harmed by a rabid bat are remote if you simply do not attempt to handle bats. *Any bat that can be easily caught should be assumed to be sick and left alone.* We do not recommend attracting bats to places where curious children are likely to attempt handling them. With or without bats in your yard, *the most important action you can take to protect your family from rabies is to vaccinate your family dogs and cats.*

Criteria For Successful Bat Houses

1. Design All bat houses should be at least 2 feet tall (61 cm), have chambers at least 14 inches (36 cm) wide, and have a landing area extending below the entrance at least 3 to 6 inches (8 to 15 cm) (some houses feature recessed partitions that offer landing space inside). Taller and wider houses are even better. Rocket boxes should be at least 3 feet (91 cm) tall and have at least 12 inches (30 cm) of linear roost space. Most bat houses have one to four roosting chambers—the more the better. Roost partitions should be carefully spaced 3/4 to 1 inch (19 to 25 mm) apart. All partitions and landing areas should be roughened. Wood surfaces can be scratched or grooved horizontally, at roughly 1/4- to 1/2-inch (6 to 13 mm) intervals, or covered with durable square, plastic mesh [1/8- or 1/4-inch (3 to 6 mm) mesh, available from companies such as Internet, Inc. at 1-800-328-8456]. Include vents approximately 6 inches (15 cm) from the bottom of all houses 24 to 32 inches (61 to 81 cm) tall where average July high temperatures are 85°F (30°C) or above. Front vents are as long as a house is wide; side vents 6 inches (15 cm) tall by 1/2 inch (13 mm) wide. Houses 36 inches (91 cm) or taller should have vents approximately 10 to 12 inches (25 to 30 cm) from the bottom.

2. Construction For wooden houses, a combination of exterior plywood (ACX, BCX or T1-11 grade) and cedar is best. Plywood for bat house exteriors should be 1/2-inch (13 mm) thick or greater and have at least four plies. Do not use pressure-treated wood. Any screws, hardware or staples used must be exterior grade (galvanized, coated, stainless etc.). To increase longevity, use screws rather than nails. Caulk all seams, especially around the roof. Alternative materials, such as plastic or fiber-cement board, may last longer and require less maintenance.

3. Wood Treatment For the exterior, apply three coats of exterior grade, water-based paint or stain. Available observations suggest that color should be black where average high temperatures in July are less than 85°F (30°C), dark colors (such as dark brown or dark gray) where they are 85° to 95°F (30° to 35°C), medium colors where they are 95° to 100°F (35° to 38°C) and white or light colors where they exceed 100°F (38°C). Much depends upon amount of sun exposure; adjust to darker colors for less sun. For the interior, use two coats dark, exterior grade, water-based stain. Apply stain after creating scratches or grooves, or prior to stapling plastic mesh. Paint fills grooves, making them unusable.

4. Sun Exposure Houses where high temperatures in July average 80°F (27°C) or less should receive at least 10 hours of sun; more is better. At least six hours of direct daily sun are recommended for all bat houses where daily high temperatures in July average less than 100°F (38°C). Full, all-day sun is often successful in all but the hottest climates. To create favorable conditions for maternity colonies in summer, internal bat house temperatures should stay between 80° and 100°F (27° and 38°C) as long as possible.

5. Habitat Most nursery colonies choose roosts within 1/4 mile (400 m) of water, preferably a river or lake. Greatest bat house success has been achieved in areas of diverse habitat, especially where there is a mixture of varied agricultural use and natural vegetation. Bat houses are most likely to succeed in regions where bats are already attempting to live in buildings.

6. Mounting Bat houses should be mounted on buildings or poles. Houses mounted on trees or metal siding are seldom used. Wooden, brick or stone buildings with proper solar exposure are excellent choices, and locations under the eaves often are successful. Single-chamber houses work best when mounted on buildings. Mounting two bat houses back to back on poles is ideal (face one house north, the other south). Place houses 3/4 inch (19 mm) apart and cover both with a galvanized metal roof to protect the center roosting space from rain. All bat houses should be mounted at least 12 feet (4 m) above ground; 15 to 20 feet (5 to 6 m) is better. Bat houses should not be lit by bright lights.

7. Protection from Predators Houses mounted on sides of buildings or on metal poles provide the best protection from predators. Metal predator guards may be helpful, especially on wooden poles. Bat houses may be found more quickly if located along forest or water edges where bats tend to fly; however, they should be placed at least 20 to 25 feet (6 to 8 m) from the nearest tree branches, wires or other potential perches for aerial predators.

8. Avoiding Uninvited Guests Wasps can be a problem before bats fully occupy a house. Use of 3/4-inch (19 mm) chambers reduces wasp problems. Wasp nests should be removed in late winter or early spring before either wasps or bats return. Open-bottom houses greatly reduce problems with birds, rodents or parasites, and guano does not build up inside.

9. Timing Bat houses can be installed at any time of the year, but are more likely to be used during their first summer if installed before the bats return in spring. When using bat houses in conjunction with excluding a colony from a building, install the bat houses at least two to six weeks before the actual eviction, if possible.

10. Importance of Local Experimentation It is best to test for local needs before putting up more than three to six houses, especially comparing those of different darkness and sun exposure.

Excerpted and summarized from The Bat House Builder's Handbook, 2003 printing, © 1993 by Bat Conservation International, Inc.

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Bat Incidents at Children's Camps, New York State, 1998–2002

Amy Robbins,* Millicent Eidson,* Mary Keegan,*
Douglas Sackett,* and Brian Laniewicz*

From 1998 to 2002, a total of 299 bat incidents were reported at 109 children's camps in New York; 1,429 campers and staff were involved, and 461 persons received rabies treatment. In 52.5% of the incidents, the bat was captured and samples tested negative for rabies virus, which resulted in 61.3% of persons not receiving rabies treatment.

Rabies is a neurologic disease with close to a 100% case-fatality rate; once clinical signs appear, it is almost always untreatable (1). After a person is exposed to rabies, death can be prevented only if treatment, commonly referred to as postexposure prophylaxis (PEP), is initiated. PEP includes an initial dose of immune globulin and a series of 5 doses of rabies vaccine in a 1-month period. PEPs are costly in terms of money and time because of the 5 medical visits, particularly if the person must be transported elsewhere for the treatment. The New York State Department of Health (NYSDOH) has a unique program that requires that rabies exposures and treatments be reported. County expenses associated with authorized treatments in accordance with state and federal guidelines are then partially reimbursed (2).

Despite a large number of rabid animals in the United States (7,967 confirmed in 2002), rabies in humans is rare because of the availability of PEP; 31 cases were reported in the United States from 1990 to 2003 (3). Twenty-nine (94%) of the 31 cases were associated with bat rabies variants, and a bat bite could be definitively documented for only 3 of them (3). Four children in the United States (4–8) and 1 child in Quebec, Canada, died of bat-related rabies (9). The families of the children in the United States were unaware of the potential for rabies transmission from bats.

Children's summer camps share habitats favored by bats and other wildlife; thus, children and camp staff may come into contact with bats that are either roosting in camp buildings or flying among camp facilities while foraging. A camp-related rabies death occurred in Alberta, Canada, in 1985 in a 25-year-old student who had been bitten and scratched by a bat and received no treatment (10).

Of the 3,827 bats tested by the NYSDOH Wadsworth Center's Rabies Laboratory in 2002, 102 (2.6%) were rabid (11). Although the probability of an individual bat being rabid is relatively low, bats that can expose humans to rabies must be assumed rabid, when a definitive diagnosis of rabies cannot be made. In 1999, the federal Advisory Committee on Immunization Practices (ACIP) updated the national PEP recommendations to include incidents with bats in which there was a "reasonable probability that exposure has occurred" (12). These types of incidents include direct contact with a bat; a bite, scratch, or mucous membrane contact with bat saliva or nervous tissue; a sleeping person awakening to find a bat in the room; or an adult witnessing a bat in the room with a previously unattended child, or a mentally disabled or intoxicated person (12).

The Study

In 1998, the NYSDOH Zoonoses Program began an educational program to address the importance of bats in camp settings. This program was conducted in collaboration with the NYSDOH Center for Environmental Health (CEH), Bureau of Community Environmental Health and Food Protection (BCEHFP). NYSDOH offered training for all local and state health department camp inspectors responsible for inspecting camps before opening each season. Fact sheets on bats and bat-proofing camps and houses, bat capture kits, guidelines for managing bats, risk for rabies transmission (particularly in children's camp settings), and guidance regarding human exposure to rabies and treatment decisions were provided. Starting in 1999, these materials included rabies awareness refrigerator magnets instructing people to contact health departments and not release bats when they are found in dwellings, and rabies awareness stickers for children to teach them not to touch bats (13). In 2003, ~700 children's camps received a videotape about keeping bats out of occupied dwellings and capturing bats for testing in exposure incidents.

Children's camp operators are required by New York State Public Health Law to obtain a permit, and camps must undergo inspection by the local health department. Associated regulations require camp operators to report certain camper injuries and illnesses within 24 hours of occurrence. Beginning in 1998, bat incidents were reported to the NYSDOH's Zoonoses Program and to BCEHFP. In 1999, the Children's Camp Bat Exposure Incident Report form was developed to standardize the reports. Twenty-three different types of incidents could be reported, 13 of which were considered probable rabies exposures requiring consideration of PEP. The form was revised in 2000 to include additional information about the incidents, and in 2001 and 2002 the types of bat incidents reported were limited to the 13 types that require consideration of

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PEP if the bat is not tested and confirmed negative for rabies. These incidents include: bite; scratch; saliva or nervous tissue contact; direct physical contact with live or dead bat; person touched bat without seeing the part of bat touched; bat flew into person and touched person's bare skin; bat flew into person and touched person's lightweight clothing, and person reports feeling an unpleasant sensation at the point of contact; person with bare feet stepped on bat; person awakens to find a bat in the room; live bat found in room with an unattended infant, child, or person with sensory or mental impairment; person slept in small, closed-in camp cabin, in which bats were swooping past sleeping person; bat found on ground near an unattended infant, child, or person with mental impairment; unidentified flying object hits person and time of day (dusk or dawn), presence of mark where hit, and place where flying object came from (i.e., good site for roosting bats) all support likelihood that it was a bat. The camps reported the bat incidents to the local health department or NYSDOH district offices, which submitted the incident report forms to BCEHFP; that bureau then forwarded the forms to the Zoonoses Program. Staff from the Zoonoses Program and Wadsworth Center taught local and district camp inspectors how to prevent human contact with bats, bat capture techniques, and methods of evacuating a building during an incident.

Reported incidents and additional information from 3 other reporting sources were added to the children's camp database for the final analysis. Information included: 1) specimen history forms for camp-associated bats that were tested at the Rabies Laboratory; 2) the Zoonoses Program rabies exposure and PEP database established by a statewide reporting requirement; and 3) CEH's environmental Health Information and Permitting System (eHIPS).

From 1998 to 2002 during the summer camp season (June through August), 299 bat incidents were reported at 109 of the estimated 2,600 NYS children's camps, involving 1,429 campers and staff (Table). The average and median ages of persons in bat incidents (based on the reported ages of 963 persons) were 14.8 and 13 years, respectively. During the 5-year period, 461 (32.2%) exposed persons (337 campers, 123 staff, 1 unknown status) received PEP (Figure 1). Forty-six persons refused PEP, and treatment status was unknown for 117. Over the

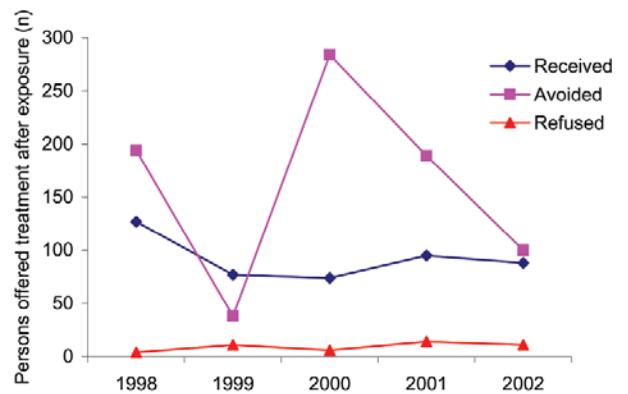


Figure 1. Number of persons who refused, received, or avoided postexposure prophylaxis (PEP) in children's camp bat incidents, New York State, 1998–2002. Treatment status was unknown (not reported to New York State Department of Health) for 117 persons: 9 persons in 1998, 19 persons in 1999, 22 persons in 2000, 33 persons in 2001, and 34 persons in 2002. PEP was avoided because the bats were captured and tested negative for rabies virus.

5-year period, bats were submitted for testing, and rabies was ruled out in 52.5% of the incidents. These test results prevented 805 (61.3%) exposed persons (567 campers, 196 staff, 42 unknown status) from having PEP treatment. Of the 209 bats tested from 1998 to 2002, 4 bats collected in 2000 were rabid, and these incidents did not require any treatment for exposure.

Four types of bat exposure reported most frequently accounted for 1,098 (77%) of persons in bat incidents at children's camps (Figure 2). Exposure types were unknown for 69 of the incidents from 1998 to 2002. Specific exposure types (more than 1 type could be reported per incident) and numbers of persons exposed were sleeping where a bat was seen (797), sleeping where bats were swooping (205), direct physical contact with a bat (62), and a bat flying into them (36). The proportion of treatments prevented because of bats testing negative for rabies was 63%, 37%, 26%, and 11%, for these 4 types of exposure, respectively.

Conclusions

From 1998 to 2002, almost 300 separate bat incidents involving ≈1,500 children and staff at children's camps in New York State were reported. Approximately one third of

Bat incidents	1998	1999	2000	2001	2002	Total
Reported incidents (June–August)	45	34	74	74	72	299
No. of incidents with bat submitted for testing (%)	19 (42.2)	5 (14.7)	44 (59.4)	50 (67.5)	43 (59.7)	161 (53.8)
No. of incidents with rabid bat	0	0	4	0	0	4
No. of camps reporting incidents	16	21	46	42	40	109
No. of persons in reported incidents	334	145	386	331	233	1,429

*From 1998 to 2000, all bat incidents at children's camps were requested for reporting. From 2001 to 2002, only bat incidents resulting in concern about potential rabies exposure were requested for reporting.

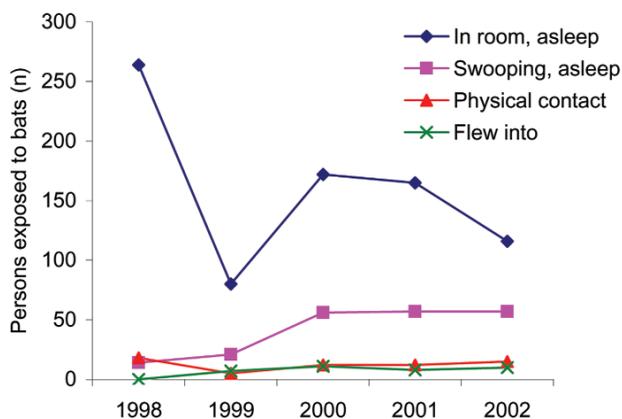


Figure 2. Number of persons exposed to bats by most frequently reported incident types, New York State, 1998–2002. Shown are the 4 most reported exposures of 23 reportable incidents of any type from 1998 to 2000, and of the 13 reportable exposure types from 2001 to 2002. Postexposure prophylaxis was avoided because the bats were captured and tested negative for rabies virus.

these persons received PEP because the bats were not captured and tested to rule out rabies. PEP treatment of ≈ 800 persons was not necessary because the bats were captured and tested negative for rabies.

At an estimated cost of \$1,136 per PEP (2), this represents healthcare cost savings $\geq \$900,000$. This estimate underestimates the true cost savings of preventing 5 medical visits during a month for each treated person, transportation costs, coordinating and administering the treatments, opportunity and psychological costs of missing camp, and lost wages.

Most of those involved in bat incidents were campers, which is not unexpected, as most camps have a higher number of campers than staff. Gender often depended on which camp was affected, as many camps are single sex. The 4 most common types of bat exposures requiring PEP are ones in which there is a reasonable probability that rabies exposure has occurred. The 2 most common types of incidents in which PEP was required (sleeping where a bat was seen or was swooping) are preventable by properly bat-proofing camp cabins. PEP can also be avoided with proper bat capture technique and cabin evacuation. In 1 camp, after 5 incidents in a short period, PEP treatment was required in 42 cases. Education on bat-proofing and capture did not prevent 25 subsequent incidents in the same season but did result in bat capture and negative rabies test results in 24 of them, preventing 180 campers and staff members from receiving PEP treatment.

Although only a few human rabies cases are diagnosed each year in the United States, inapparent or unreported bat bites appear to account for most of them (14). Equally important, bat exposures strongly affect healthcare costs

when rabies cannot be ruled out by capturing and testing bats. Just as it is unacceptable for other wildlife to affect the health and safety of children at camp, keeping bats out of sleeping quarters and other buildings should be part of routine camp safety education, inspection, and certification programs. Although bats are part of the external camp environment, occupied buildings must be bat-proof. If exposures around or in camp buildings do occur, campers and staff must know how to avoid further exposures and how to capture the bat for rabies testing. Systems for reporting camp bat exposures and their consequences will identify this important public health problem and aid public health responses to reduce its impact.

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Acknowledgments

The Department of Public Health and Human Services, Communicable Disease and Epidemiology Section would like to thank the following organizations for their invaluable assistance compiling this “Bats and Summer Camps in Montana” rabies awareness packet:

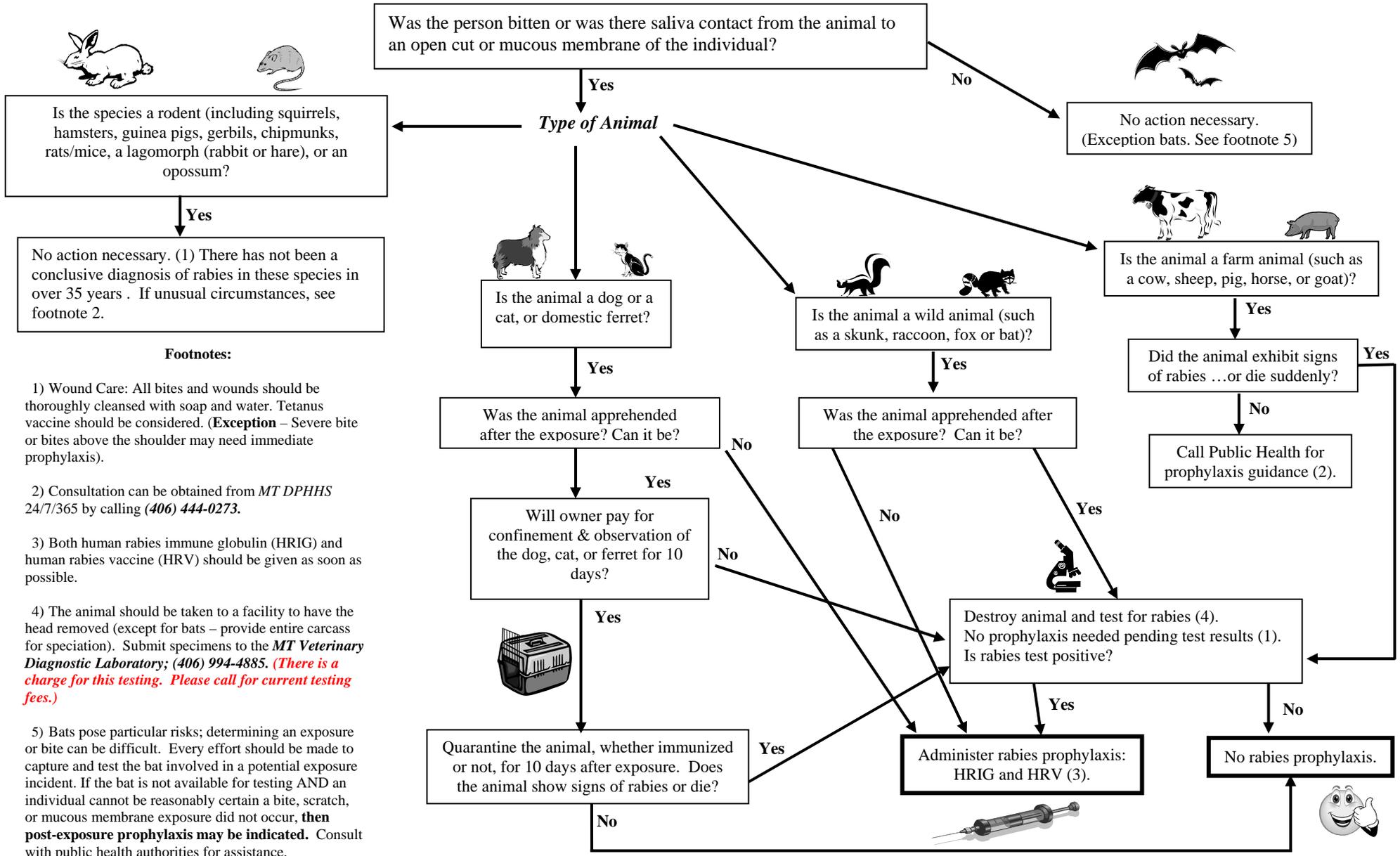
Bat Conservation International – P.O. Box 162603, Austin TX 78716, (512) 327-9721 or visit www.batcon.org.

Centers for Disease Control and Prevention - National Center for Zoonotic, Vector-Borne, & Enteric Diseases, 1600 Clifton Rd, Atlanta GA 30333, (800) 232-4636 or visit www.cdc.gov/rabies/.

Montana State University- Extension Services, 416 Culbertson Hall, Montana State University- Bozeman, Bozeman MT 59717, (406) 994-2721 or visit www.msuextension.org.

Montana Department of Public Health and Human Services

RABIES EXPOSURE ASSESSMENT TREE



Footnotes:

1) Wound Care: All bites and wounds should be thoroughly cleansed with soap and water. Tetanus vaccine should be considered. (Exception – Severe bite or bites above the shoulder may need immediate prophylaxis).

2) Consultation can be obtained from MT DPHHS 24/7/365 by calling (406) 444-0273.

3) Both human rabies immune globulin (HRIG) and human rabies vaccine (HRV) should be given as soon as possible.

4) The animal should be taken to a facility to have the head removed (except for bats – provide entire carcass for speciation). Submit specimens to the MT Veterinary Diagnostic Laboratory; (406) 994-4885. (There is a charge for this testing. Please call for current testing fees.)

5) Bats pose particular risks; determining an exposure or bite can be difficult. Every effort should be made to capture and test the bat involved in a potential exposure incident. If the bat is not available for testing AND an individual cannot be reasonably certain a bite, scratch, or mucous membrane exposure did not occur, then post-exposure prophylaxis may be indicated. Consult with public health authorities for assistance.