

# Bats

## FACTS vs. FICTION

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# BATS

The most serious problem arising from the sudden appearance of a bat are those created by panicked responses. Bats that appear in people's homes are lost younger bats who are at least as afraid of humans as we are of them. Their only interest is a safe escape.

A sudden exit from the house would perhaps be your worst possible action. By the time help can be found, the bat will likely have wandered into another part of the house and gone to sleep. It then becomes nearly impossible to find. Alternatively, it may have found its own way out, but in either case, people will have to live with the fear of its reappearance for a week or more.

## Removal

Most bats will be active, probably flying, when found, but some may be roosting and asleep. Especially during cool weather, a few will be torpid. Torpid is a state of greatly reduced activity and metabolism that results from lowering of body temperature. These bats can be so lethargic as to appear sick or even dead. As they arouse, they may bare their teeth and squeak or hiss loudly, leading people to think they are vicious. In reality, they are simply trying to ward off possible attack during a period of relative helplessness. They should not be handled without leather work gloves, because they are more likely than usual to bite in self-defense if touched at such times.

An arousing bat is often incapable of flight for several minutes to an hour. It must first warm itself by shivering; the lower the bat's body temperature, the longer it takes to warm itself. In the meantime, it can be gently scraped into a can or box, allowed to arouse in a covered container in a warm place, and released outside when fully awake.

A bat found flying around a home should be kept in sight while all doors leading to other parts of the house are closed, thereby isolating it in a single room. Then, if possible, windows and doors to the outside should be opened so the bat can leave on its own. You need not turn the lights off to be successful. Otherwise, wait until the bat lands, and approach it slowly to avoid frightening it back into flight. Then place a small box or coffee can over it and slide a piece of cardboard under the container to trap the bat inside. Release the bat outdoors, and you can be confident that it is unlikely to be found indoors again. Bats have good memories and don't like to repeat close calls. Of course, others may appear if you do not find out how that bat entered and prevent further access.

Bats that suddenly appear in people's homes or offices have usually entered through rather predictable routes. The most obvious are open doors and windows; two other common routes are ungrated chimneys and loose-fitting screen doors. A piece of half-inch mesh hardware cloth over the top of the chimney or a tighter fitting screen door will do the trick. If there is a stairwell leading to the attic, check to see if a space exists at the bottom of the door. Young bats are less skilled fliers and sometime get trapped in stairwells where they end up crawling under the door. A draft guard will solve the problem.

If none of the previous solutions fit your situation or a problem persists after the more obvious routes have been closed, then conduct a room-by-room search for less conspicuous entry points. Any holes more than half an inch in diameter or any crack of at least a quarter of an inch by an inch and a half or more should be closed, especially those leading to outer walls or an attic. Air intakes may need a screen covering, and open spaces around plumbing can be closed with steel wool or other suitable material. Even duct tape can exclude bats, because unlike rodents, bats do not chew holes in walls, nor do they gnaw electrical insulation.

## **Exclusion**

Large numbers of bats living in an attic or wall space can be a nuisance. Fortunately, most colonies are small, often remaining unnoticed for many years. Where guano accumulations or noise from larger groups require a solution, eviction and exclusion are the only safe, permanent remedies.

Any bat colony large enough to be a real nuisance contains sufficient individuals to easily indicate the point of entry to their roosting place. When they emerge at dusk to feed, watch the building to see where they leave. Closer inspection during the day should reveal the holes or cracks through which they are exiting. Often these will be under the eaves, behind a chimney or loose boards, beneath a roof ridge cap, or inside an opening made by squirrels or birds. Exact locations may be further identified by stains caused by body oils or droppings. Once exits have been located, the bats can be excluded. This should **not** be done when flightless young may be present (usually in June through August). Excluding the parents will starve the young and create an odor problem.

Most bats leave their roost in buildings in the fall, permitting exclusion during their winter absence. When this is not the case, or when one does not wish to wait that long, there is a relatively simple exclusion technique using half-inch polypropylene bird netting. Hang the netting during the day, directly above

exits, using duct tape or staples. The netting should be attached several inches above the exit holes, extending at least one foot to each side and below. The sides may be attached to the building, but the bottom must be allowed to hang free, permitting the bats passage to the outside. The bats have no trouble dropping down to leave, but when they attempt to fly straight in upon their return, the netting acts as a one-way exclusion valve until repairs can be made. Allow two or three nights to ensure that no bats are trapped inside. The netting, mostly used to protect fruit trees from birds, is inexpensive.

Exclusion of bats from Spanish or concrete tile roofs also can be achieved with the use of bird netting, but preventing their return is complicated by the many potential entry points. The simplest solution is to install rain gutters along the edges of all sides of the building. Open ends of the tile along ridges can be filled with cement, though this is usually not necessary. The rain gutters permit bats to exit, but make it difficult for the bats to enter.

In most states, no pesticides are registered for the control of bats. Repellents and ultrasonic devices tested thus far have proven highly ineffective.

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# Dealing With Unwanted Guests

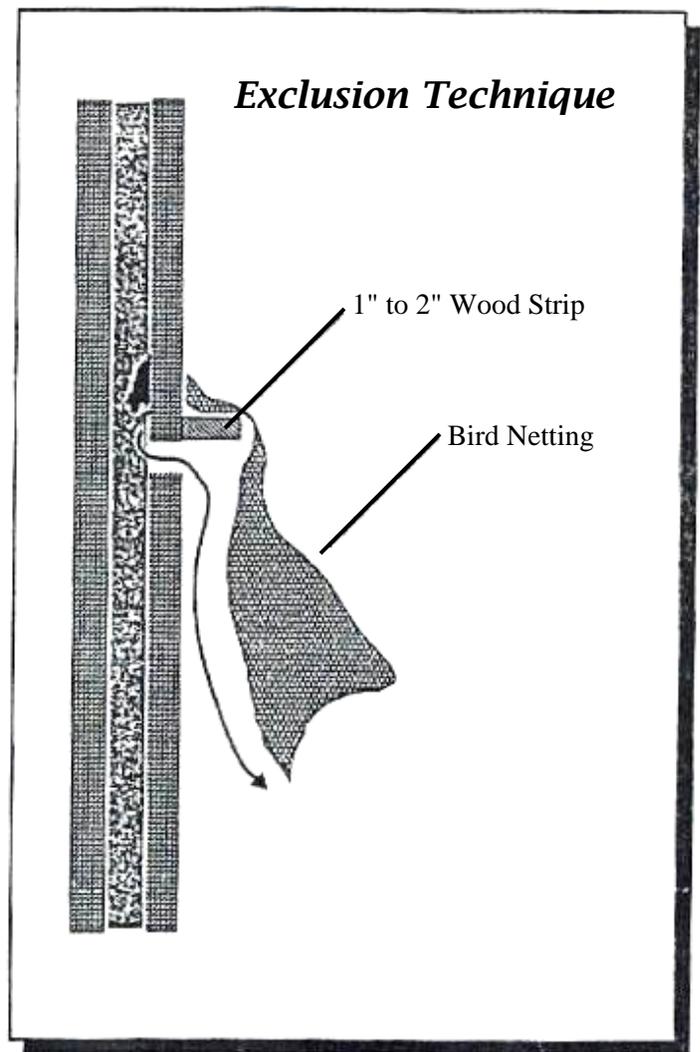
Bats that fly into human living quarters are usually lost youngsters whose primary goal is a safe escape. They often will leave on their own if a window or door to the outside is opened while others are closed. Bats are not aggressive, even if chased, but may bite if grabbed. As with any wild animal, bats never should be handled with bare hands. An exit can be hastened by catching the bat with a hand net (swung from behind), or when the bat lands, by covering it with a coffee can and slipping a piece of cardboard over the opening. It can be released outside. Or you may also catch it by hand using leather work gloves to avoid being bitten.

## EXCLUDING AN ENTIRE 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 can potentially 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 must then be covered or plugged. For small cervices, silicone caulking may help.

If a large bat colony must be evicted from a wall or attic, careful observations must 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 (usually June through August in the U.S.). Starved young could create a serious odor problem.

Most bat species leave in winter, permitting exclusion in their absence. When this is not the case, or when one does not wish to wait for winter, there is a relatively simple technique using polypropylene bird netting. This inexpensive netting is often used to protect fruit trees from birds and 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 four inches in front of bat exit holes, and extending at least two feet below and to the sides of exit points (see illustration), will allow the bats to emerge, but later they will fail to find their way back. Thus the netting acts as a simple one-way excluder until repairs can make the exclusion permanent. During cool periods in the fall or spring, allow a least a week.



## **OTHER METHODS**

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 to be ineffective and some may endanger people or even attract bats.

Naphthalene flakes (moth balls) are hardly any better. To be 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.

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 licensed for use against bats. Furthermore, it is a direct violation of federal law to use a chemical in any other way than that which it is strictly intended. In most cases, the only safe, permanent solution is exclusion.

\* Netting available from:

Wildlife Control Technology: 2501 North Sunnyside Ave., Suite 103, Fresno, CA 93727

Telephone: 1-800-235-0262 or 1-559-490-2262

(This company markets a bat net kit which includes the netting, tie-downs, and instructions for use in difficult situations.)

## **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. There are no records of house-dwelling bats ever transmitting rabies through the air, feces, or urine. 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 by 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.

# Bats and Public Health Concerns

Bats play key ecological roles as primary predators of the vast numbers of insects that fly at night, including the kinds that cost American farmers and foresters billions of dollars annually. Contrary to common misconceptions, disease transmission from bats to people is easily avoided. *Never handle bats or breathe dust from bird or bat droppings, and the odds of being harmed will be extremely remote.*

## RABIES

### WHAT IS IT?

Rabies is a viral infection of the central nervous system. The infection results in a fatal inflammation of the brain, and sometimes the spinal cord. Once symptoms appear, the disease is almost universally fatal.

### HOW DO YOU GET IT?

Worldwide, more than 30,000 humans die from rabies each year. Ninety-nine percent of these deaths are due to contact with rabid dogs, the most important vector of human rabies worldwide. A rabies exposure requires contact with an open wound or mucous membranes (eyes, nose, or mouth) and a rabid animal's saliva or nervous tissue. Non-bite exposure to the virus is extremely rare, but may result from infected saliva or nervous tissue contact with open wounds, abrasions, or mucous membranes. Only four cases of the disease in humans have been attributed to inhalation of aerosolized virus. Two of these were a result of exposures that occurred in rabies research laboratories. The other two were the result of exposures that occurred within extremely unique conditions that exist inside just a few caves. There is no evidence of transmission through contact with urine or feces.

### HOW ARE CASES OF POSSIBLE EXPOSURE TREATED?

Modern rabies treatment is highly effective and relatively painless. According to the National Centers for Disease Control and Prevention in Atlanta, GA, cases of possible rabies exposure are typically treated with both human immunoglobulin (HRIG), and a human diploid cell vaccine (HDCV). These injections are relatively painless and are given as soon as possible following exposure, followed by subsequent vaccine doses on days 3, 7, 14, and 30.

### IS THERE A PREVENTATIVE VACCINE?

The simplest method for preventing exposure to the disease is to avoid contact with unfamiliar animals and to never handle wild mammals. Laboratory personnel, biologists, or other individuals who have a high probability of contact with infected animals may receive a series of three pre-exposure vaccinations. These vaccinations are given on day 0, 7, and 21 or 28. Pre-exposure vaccination does not eliminate the need for post-exposure treatment if exposed to a suspected rabid animal. Pre-exposure immunization simplifies subsequent treatment in that only 2 vaccinations are required following exposure.

### BATS AND RABIES:

Most anti-rabies treatments given are not a result of human contact with bats, but rather a result of possible exposure through human contact with domestic dogs. Like all mammals, a few bats contract rabies. Even those rarely bite except in self-defense if handled. The animals typically tested by health departments are sick and injured specimens that have had human or pet contact, and are potential rabies suspects. As would be expected, the frequency of infection in these samples will be higher than those found in bat populations as a whole. No rates above half a percent have been found in unbiased samples. Any bat, or other wild animal, that can be caught is more likely than others to be sick, so they should never be handled, except by an expert. As of December 1993, only 28 human rabies cases worldwide have been linked to insectivorous bats. The most frequent user of artificial bat habitat (i.e. bat houses) in America is the Little Brown bat (*Myotis lucifugus*), a species that is not known to have transmitted a single case of rabies to people or pets in North American history. *The threat of rabies is virtually nonexistent for anyone who vaccinates all family dogs and cats and does not handle unfamiliar animals.*

## **DO BATS CAUSE RABIES OUTBREAKS IN OTHER WILDLIFE?**

There is no evidence that rabies from bats has ever triggered an outbreak in other animals. Although there is some transmission of bat strains of rabies to a small spill-over population of other mammals, North American insectivorous bat strains do not create epidemic outbreaks. Despite the presence of 20 million bats at Bracken Cave in Central Texas, surrounding landowners encounter no more rabid wildlife that would be found anywhere else. This is typical around bat concentrations country-wide.

## **HISTOPLASMOSIS**

### **WHAT IS IT?**

Histoplasmosis is a respiratory illness, a disease of humans and other mammals caused by the fungus *Histoplasma capsulatum*. The fungus occurs naturally in the soil in areas that are relatively warm and humid.

### **HOW DO YOU GET IT?**

Development of this fungus is enhanced by organic materials like bird droppings or bat guano, and human infection takes place through inhalation of the fungal spores that are dispersed by stirring up dry fecal deposits. Ninety-percent of all reported cases in humans come from the Ohio and Mississippi River valleys and adjacent areas where warm, humid conditions favor growth of the fungus. The vast majority of histoplasmosis cases 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.

### **ARE BAT ROOSTS MAJOR SOURCES OF HISTOPLASMOSIS INFECTION?**

Bird roosts are the most important sources of infection. The fungus, *Histoplasma capsulatum*, does not normally survive in hot, dry attics. The warm humid conditions that exist in some caves may be conducive to growth of the fungus, and inhalation of dust in such areas should be avoided. Persons cleaning up droppings of either birds or bats should wear properly fitted respirators that will filter out particles as small as two microns in diameter to reduce the risk of exposure. Further information regarding prevention of exposure to this fungus may be obtained from the National Centers for Disease Control and Prevention in Atlanta, Georgia.

## **PARASITES**

### **ARE BAT PARASITES A PUBLIC HEALTH THREAT TO HUMANS?**

Ectoparasites are organisms that feed on a host animal. Bat ectoparasites are sometimes found in the animal's coat and may include fleas, flies, true bugs, chiggers, ticks, or mites. Most bat parasites are closely associated with one or more bat species, and cannot survive on other animals. Therefore they rarely bite humans or domestic pets and cannot survive on them more than briefly. There are no known instances of disease transmission to humans from bat parasites. Parasites that remain after bats have been excluded from buildings soon die without their hosts.

#### References:

Brass, D. 1994. *Rabies in Bats, Natural History & Public Health Implications*, Livia Press, P.O. Box 983, Ridgefield, CT 06887-9998, 352p.

Constantine, Denny G. 1988. "Health Precautions for Bat Researchers" in *Ecological and Behavioral Methods for the Study of Bats*, T.H. Kunz (ed.) Smithsonian Institution Press, Washington DC, 533p.

U.S. Department of Health and Human Services, Center for Disease Control, National Center for Infectious Diseases-Division of Bacterial and Mycotic Diseases, *Recommendations of the Immunization Practices Advisory Committee (ACIP)*, 1991.

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# IMPORTANT BAT FACTS

Nearly 1,000 kinds of bats account for almost a quarter of all mammal species, and most are highly beneficial.

A single Little Brown Bat can catch 600 mosquitoes in just one hour.

A colony of 150 Big Brown Bats can protect farmers from up to 13 million or more rootworms each summer.

The 20 million Mexican Free-tail Bats from Bracken Cave, Texas eat 250 tons of insects nightly.

Tropical bats are key elements in rain forest ecosystems, which rely on them to pollinate flowers and disperse seeds for countless trees and shrubs.

In the wild, important agricultural plants, from bananas, breadfruit, and mangoes to cashews, dates, and figs rely on bats for pollination and seed dispersal.

Tequila is produced from Agave plants whose seed production drops to 1/3,000th

of normal without bat pollinators.

Desert ecosystems rely on nectar-feeding bats as primary pollinators of giant cacti, including the famous Organ Pipe and Saguaro of Arizona.

Bat droppings in caves support whole ecosystems of unique organisms, including bacteria useful in detoxifying wastes, improving detergents, and producing alcohol and antibiotics.

An anticoagulant from Vampire Bat saliva may soon be used to treat human heart patients.

Contrary to common misconceptions, bats are not blind, do not become entangled in human hair, and seldom transmit disease to other animals or humans.

All mammals can contract rabies; however,

even the less than a half of 1% of bats that do, normally bite only in self-defense and pose little threat to people who do not handle them.

Bats are exceptionally vulnerable to extinction, in part because they are the slowest reproducing mammals on earth for their size. Most produce only one young a year.

Nearly 40% of American bat species are threatened or endangered. Around the world, many more are declining at alarming rates.

Loss of bats increases demands for chemical pesticides, can jeopardize whole ecosystems of other animal and plant species, and can harm human economies.

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# AMAZING BAT TRIVIA

The world's smallest mammal is Bumblebee Bat of Thailand, weighing less than a penny.

Giant Flying Foxes that live in Indonesia have wingspans of nearly six feet.

The common Little Brown Bat of North America is the world's longest-lived mammal for its size, with life spans sometimes exceeding 32 years.

Mexican Free-tailed Bats sometimes fly up to two miles high to feed or catch tailwinds that carry them over long distances at

speeds of more than 60 miles per hour.

The Pallid Bat of western North America is immune to the stings of scorpions and even the seven inch centipedes upon which it feeds.

Fishing Bats have echolocation so sophisticated that they can detect a minnow's fin as fine as a human hair protruding only two millimeters above a pond's surface.

African Heart-nosed Bats can hear the footsteps of a beetle walking on sand from a distance of more than six feet.

Red Bats, which live in tree foliage throughout most of North America, can withstand body temperatures as low as 23°F during winter hibernation.

Tiny Woolly Bats of West Africa live in the large webs of colonial spiders.

The Honduran White Bat is snow white with a yellow nose and ears. It cuts large leaves to make "tents" that protects its small colonies from jungle rains.

Frog-eating Bats identify edible from poisonous frogs by listening to the mating calls of male frogs. Frogs counter by hiding and using short, difficult-to-locate calls.

Vampire bats adopt orphans and have been known to risk their lives to share food with less fortunate roost-mates.

Male Epauleted Bats have pouches in their shoulders that contain large, showy patches of white fur, which they flash during courtship to attract mates.

Mother Mexican Free-tailed Bats find and nurse their own young, even in huge colonies where many millions of babies cluster at up to 500 per square foot.

To learn more about bats and how you can help save them, join:

Bat Conservation International  
[www.batcon.org](http://www.batcon.org)