

Living With Bats in Wyoming

Over half of the bat species in the US are known to roost in or on buildings at least some of the time. Unfortunately, this sometimes places them in direct conflict with humans. Fears and misconceptions about bats and rabies; a dislike for or antipathy toward bats; and noise, odors, and droppings have all prompted humans to deliberately exclude, repel, and even exterminate bats roosting in buildings.

However, in many cases, owners are not bothered by or even aware of the bats roosting in or on their houses and buildings. Unlike rodents, bats do not make holes in buildings, chew wiring, or build nests. Although large concentrations of bats can cause odors and accumulations of guano, many roosts are small and do not cause problems except to deposit droppings on the porch or sidewalk. Bats avoid humans wherever possible and reports of unprovoked attacks by bats are usually the result of a disoriented bat landing on the nearest available object.

Although people are sometimes concerned about the transmission of rabies and other diseases, bats roosting in areas that are outside the living space of humans, such as attics or the exterior of buildings, pose little risk. Although bats are known to host a variety of

diseases, in reality, they are no more or less likely to have diseases than other animals, and disease transmission to humans is rare. Only two diseases—rabies and histoplasmosis—are known to have been transmitted from bats to humans, and exposure risks are easy to avoid. A third disease, West Nile virus, is still poorly understood, and has not yet been well studied in bats.



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rabies

Rabies is a viral infection that affects the central nervous system of mammals, including humans. It is most often reported in wild animals, particularly raccoons, skunks, foxes, coyotes, and bats, while domestic animals, including cats, dogs, and livestock, account

for about 7% of rabid animals reported in the US. Bats can contract and transmit rabies, and the disease has been found at one time or another in many North American species of bats. However, media coverage of rabies in bats is often sensationalized and exaggerated, and folklore depictions of bats often perpetuate irrational fears. There is often a biased view of the incidence of rabies in bat populations because bats that are submitted for testing are most likely to be individuals that are sick and easily caught or already dead. In reality, bats do not rank very high among

mortality threats to humans and, statistically, pets, bees, playground equipment, and sports are far more dangerous to humans than bats. In North America, the incidence of rabies in bats is very low, usually less than 0.5%, and rabies from bats accounts for only about one human death per year in the US. In Wyoming, not one person has contracted rabies in nearly 30 years, although a few people have been exposed and sought treatment to prevent contracting the disease. Only 3 of the 18 bat species in Wyoming are known to have tested positive for rabies—the little brown myotis, the big brown bat, and the silver-haired bat.

Rabies is nearly always transmitted by a bite from an infected animal, although non-bite exposures can result from contact between saliva or nervous tissues of an infected animal and open wounds or the mucous membranes of the eyes, nose, or mouth. Most human exposures to infected bats result from careless handling of sick, grounded individuals. Although rabid dogs, cats, and other carnivores often become aggressive and try to attack humans and other animals, bats normally bite only in self-defense and are rarely aggressive, even when rabid.

Bats have often been cited as major carriers of rabies because of misinformation spread in the 1960s that they were asymptomatic reservoirs of the disease and would not die from it. More recent research has not supported this. Bats either survive exposure to rabies without spreading it or they succumb like other animals, usually within three to five days. Also, researchers find no credible support for the hypothesis that undetected bites by bats are a significant factor in transmitting rabies to humans, as humans usually feel and recognize any bites they receive. Furthermore, rabies cannot be transmitted by bat blood, urine, feces, or fur, and there is no evidence of airborne transmission in buildings. Although two cases of airborne transmission were reported in the 1950s in Texas caves that support very unusual environments, no similar cases have occurred since, despite the fact that many thousands of people enter bat caves each year, and no such transmission has occurred in buildings.

how to avoid exposure to rabies

Although rabies from bats does not rank very high among mortality threats to humans, prudence and the following simple precautions can help reduce the risk of exposure.

➤ Avoid handling bats wherever possible and teach children never to handle any unfamiliar animal. If it is necessary to handle a bat to transport it for rabies testing or to remove it from a building, wear



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gloves and use a piece of cardboard as a scraper to gently slide the bat from its roosting surface into a small box or coffee can.

- Bats roosting in areas of buildings that are outside the living space of humans, such as attics or building exteriors, pose little risk. Nevertheless, care should be taken to exclude bats from the living quarters or occupied spaces of homes or other buildings.
- Do not poison bats. All of Wyoming's bats are protected from intentional take by Wyoming Game and Fish Commission regulation, so killing bats intentionally is illegal. Also, poisoned and sick bats often scatter and fall to the ground where they are more likely to come into contact with children and pets. Furthermore, whether or not rabies has occurred in the colony, the stress imposed by pesticide toxicity may activate latent viral infections, thus increasing the incidence of rabies.
- Keep rabies vaccinations current for all domestic dogs, cats, and ferrets.
- People who are at high risk of exposure, such as field biologists, rabies researchers, veterinarians,

and wildlife rehabilitators, should receive pre-exposure rabies immunization.

- In the case of a bite from a bat, wash the wound thoroughly with soap and water and seek medical attention immediately. A safe and effective post-exposure vaccine is available for humans and may be appropriate unless laboratory tests show the bat to be negative for rabies.
- Any bat that bites a human should be safely captured and tested for rabies as soon as possible. If the bat is dead, avoid destroying its head, place it in a plastic bag, and keep it refrigerated. The bat may be given to a veterinarian, animal control officer, Wyoming Game and Fish Department representative, or public health official. Bats suspected of having rabies are sent to the Wyoming State Veterinary Laboratory in Laramie for testing.

histoplasmosis

Histoplasmosis is a respiratory disease caused by a fungus called *Histoplasma capsulatum* that lives in soil enriched by the droppings of animals such as birds or bats. Humans risk infection only when they inhale the spores of the fungus—when soil or guano containing the fungus is disturbed, the spores become airborne and may be inhaled. The disease usually is asymptomatic or causes minor flu-like symptoms, although it can result in serious illness if a large number of spores are inhaled. In the US, histoplasmosis is most common in the Ohio and Mississippi river valleys and other areas where high temperatures and humidity favor it. It is rare in the northern latitudes and the dry western states, although it is possible for it to develop in environments such as warm, moist caves. It is rare in Wyoming and has only been documented in one cave.

how to avoid exposure to histoplasmosis

The best way to avoid exposure to histoplasmosis is to avoid inhaling dust from animal droppings. Ways to accomplish this include the following:

- Wear a respirator capable of filtering particles as small as 2 μ in diameter or use a self-contained breathing apparatus when cleaning or entering areas with bird or bat droppings.
- Dampen dry guano with water before removal.
- Or use a vacuum cleaner to remove dry bat guano.

west nile virus

West Nile virus is a mosquito-borne virus that was first detected in the US in 1999 in New York. It quickly spread westward and was discovered in Wyoming in 2002. Birds act as reservoirs for the virus, infecting mosquitoes that may then transmit the virus back to more birds or on to other hosts. West Nile virus has been confirmed in a small number of bats in the US. Bats, like other mammals such as humans and horses, are probably “dead-end” hosts that can contract the virus but do not transmit it back to mosquitoes as birds do, but this has not been well studied. The degree to which bats are exposed to the virus and its population-level effects are also currently unknown.

how to avoid exposure to west nile virus

Although bats cannot transmit West Nile virus to humans, here are some suggestions for avoiding exposure to the disease:

- Avoid mosquito bites by staying indoors during peak mosquito-biting times (dawn, dusk, and at night); wearing light-colored long-sleeved shirts and long pants; and applying mosquito repellent, especially with DEET.
- Reduce the number of mosquitoes around human habitation by eliminating any standing water that is not ecologically important. For example:
 - Get rid of unwanted containers such as old tires and tin cans.



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Western small-footed myotis



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- Empty or change water in flowerpots, barrels, pet dishes, and birdbaths weekly.
 - Drill drainage holes in the bottoms of containers that are left outside.
 - Clean roof gutters regularly.
 - Turn over wheelbarrows and plastic wading pools when not in use.
 - Aerate ornamental pools or stock them with mosquito-eating fish.
 - Thoroughly clean livestock-watering troughs monthly.
- A balanced perspective on mosquito control for West Nile virus should reflect the important ecological role of non-target insects as natural mosquito predators, pollinators, and important food resources for bats. Massive spraying to kill adult mosquitoes is the least effective method of controlling West Nile virus, and the risks to human and wildlife health usually outweigh the benefits. Larviciding, however, which kills mosquitoes when

they are in the aquatic, larval stage, may be effective in reducing populations of mosquitoes that come into contact with humans. Larviciding should only be undertaken in disturbed or manmade bodies of water near human habitation that are less important ecologically.

resolving conflicts between bats and humans

Many bats are loyal to specific roosts, and studies have shown that bats that are excluded from their roosts in buildings often do not survive. Because the vast majority of bat colonies occupying buildings do not cause problems, they should be allowed to remain in place wherever possible. Many people choose to coexist with bats in or on their buildings and enjoy the benefits of a ready supply of fertilizer for their garden and the contribution that bats make to a healthy ecosystem as the primary predators of nocturnal insects.

- To remove a bat that has wandered into the living quarters of a house, the simplest method is to open a window or door to the outside, close the doors to other rooms, and give the bat time to fly out. If it is still present by nightfall, turn off all the lights inside the house, as light will cause the bat to hide rather than seek out the open door or window.
- Avoid handling bats whenever possible, take precautions against being bitten, and teach children not to pick up bats or other mammals. Bats found on the ground should be handled only with extreme care while transporting to a veterinarian or public official for rabies testing. Although the risk of rabies transmission is low, nevertheless care should be taken to avoid direct contact with bats and any bites should be treated as potential rabies transmission cases.
- If the bat is in a state of torpor and has not found its way out of the house, it may be possible to capture it and release it outside. Wearing gloves, use a piece of cardboard as a scraper to gently slide the bat from its roosting surface into a small box or coffee can. Keep the container in a cool place until dark, then place the bat in the crook of a tree or other safe location outside to release it. Be sure to release it on the same day it is captured so it can eat and drink on its normal cycle.
- In situations where bats are roosting in a building and there is concern about their gaining access to the living space of the building, consider isolating the area preferred by the bats from the rest of the building instead of excluding them from the

building entirely. For example, wall off a section of the attic for bats, keeping part of the attic available for storage. Also, consider installing a vapor barrier, such as polysheeting, during renovations to ensure that urine and guano odor does not contaminate the living area.

excluding bats from buildings

- Bats cannot be lured out of a preferred roost by simply placing a bat shelter nearby. If it is absolutely necessary to discourage bats from roosting in a building, exclusion—sealing bats out of the structure—is the most effective and permanent method, and allows bats at least the opportunity to seek alternative roosts. All possible entrances to the roost, as small as 3/8 inch, must be completely sealed for exclusion to be effective. Bats are often very loyal to specific roosts and are surprisingly adept at finding alternate ways into buildings, especially those that they have occupied in the past.
- Avoid bat-proofing buildings while the bats are present—the best time is during winter while they are roosting in other locations and not present (October 1 through April 1). If entrances to the roost are sealed while bats are present, they may be trapped and killed, or they may seek alternative exits and inadvertently enter the building's living space. Furthermore, young bats that are not yet able to fly are at particular risk from exclusions that are performed during the maternity period, as they

may be sealed inside the roost while the adults are out foraging.

- Exclusion techniques are site-specific, can be frustrating, and have potential to harm bats. Therefore, **please contact the Wyoming Game and Fish Department's (WGFD) Nongame Mammal Biologist** for advice before attempting to exclude bats from your building.

harassment of bats

- Do not kill bats. All of Wyoming's bats are protected from intentional take by Wyoming Game and Fish Commission regulation. Killing bats intentionally is illegal, and it is also a poor solution to problem bats in buildings. In general, killing bats is a waste of time because unless the building is made inaccessible by sealing the entrances, it will usually be recolonized by new bats.
- Do not use toxic chemicals or pesticides to control bats. Toxic chemicals and pesticides used on bats may be persistent in the building and dangerous to humans, pets, and bats for years, and sick and dying bats often scatter and fall to the ground where they are more likely to come into contact with children and pets. Furthermore, whether or not rabies has occurred in the colony, the stress imposed by pesticide toxicity may activate latent viral infections, thus increasing the incidence of rabies.
- Avoid relying on repellants and other control measures, such as broadcasting loud or ultrasonic noises, illuminating roosts, or chemical or sticky repellants, to discourage bats from roosting in a building. Although these methods are usually not lethal, they do not make the roost inaccessible to bats and are generally ineffective in deterring bats.

contact information

The WGFD uses information about where bats are roosting to learn more about bat populations in Wyoming. Personnel can also help you with ways to share your building with bats, or, if necessary, techniques for excluding bats from the building. **If there are bats roosting in your home or other building, please contact the Nongame Mammal Biologist at the Wyoming**



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Game and Fish Department, at (307) 332-2688 or (800) 654-7862.

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Western small-footed myotis