

# Facts about Wildlife Diseases: Rabies<sup>1</sup>

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## What is rabies and how does it spread?

Rabies is a virus carried by mammals. It kills infected humans and animals if they are not treated shortly after exposure. Rabies can be prevented, but it cannot be cured once symptoms become evident. The virus attacks the central nervous system (the brain and spinal cord). The most common way the virus is transmitted is through saliva when an animal infected with the virus bites another animal or person. The virus can also be transmitted through direct contact with saliva, tears, or brain/nervous tissue from an infected animal via open wounds or mucous membranes (the eyes, nose, or mouth). Less commonly, people have become infected as a result of receiving an organ transplant from an infected person (CDC 2004, FDOH 2014). Although the virus can survive outside the body of a host for only a short period of time, it can survive in bodies of dead animals for longer periods, and therefore can spread to new hosts if they contact the saliva, tears, or brain/nervous tissue of a dead rabid animal. The virus becomes noninfectious when it dries out, is heated, or is exposed to sunlight.

## Which animals can get rabies?

Fish, amphibians, reptiles, and birds cannot transmit rabies—only mammals are capable of spreading the disease. Meat-eating mammals are the most commonly infected.



Figure 1. According to Florida law, all dogs, cats, and ferrets greater than 4 months of age must be vaccinated against rabies by a licensed veterinarian.

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Worldwide, rabies is most frequently reported in dogs; unvaccinated dogs in Asia and Africa are largely responsible for the approximately 55,000 human rabies deaths worldwide each year. Rabies is uncommon in domestic animals in the United States because vaccination laws and reduction of stray animals by local animal control organizations have

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largely eliminated the disease in domesticated animals. The vast majority (90%) of reported cases of animals with rabies in the United States are wildlife.

The animals most commonly reported to have rabies in Florida are raccoons, foxes, bats, cats, dogs, bobcats, skunks, otters, and horses (see [Table 1](#) for details). Raccoons and bats are considered to be reservoir species for rabies in Florida, which means that the virus is maintained and circulates within populations of these species. To date, other species like otter, bobcat, or skunk have not been shown to act as rabies reservoirs in Florida. These non-reservoir species can still transmit rabies to people, pets, and livestock if they are infected and bite or scratch a person or an animal.

## How common is rabies?

Although rabies deaths occur regularly worldwide, in the United States it is rare for people to die of rabies. Nonetheless, many people are exposed to rabies each year. The US Centers for Disease Control estimates that the costs of rabies control and prevention exceed \$300 million annually. These costs include vaccination of pets and livestock, animal control programs, maintenance of rabies diagnostic laboratories, and medical costs. Vaccination of livestock and companion animals, diligent education and medical treatment of people exposed to rabies, active rabies management for wildlife, and control of stray animals are responsible for low rates of rabies in humans in the United States.

In the state of Florida, 77 people have died from rabies during the past 130 years. The last case of human rabies in Florida was in 2011; the man was believed to have acquired rabies from handling raccoons in North Carolina (FDOH 2014). Approximately 60,000 Florida residents and visitors are bitten by animals (pets, stray animals, and wildlife) each year, with more than 2,000 of these people considered to have been potentially exposed to rabies and thus given post-exposure treatments (FDOH 2014). According to Florida law, all dogs, cats, and ferrets older than 4 months of age must be vaccinated against rabies by a licensed veterinarian, and it is strongly recommended that horses be vaccinated. Vaccines have also been developed for cattle and sheep.

## What are the symptoms of rabies?

Animals with rabies often behave abnormally. They may be either remarkably aggressive or unexpectedly passive. Aggressive animals may attack and bite other animals or

humans for no apparent reason. Passive animals may seem unusually tame, may be active at odd times of the day, or may appear to be paralyzed. For example, bats or raccoons active at midday in your home or yard that are easy to approach may be rabid. Infected animals are often unable to swallow, which makes eating and drinking impossible, and may cause excessive drooling. As the disease progresses, animals with rabies often move slowly and may have difficulty walking or flying. Most infected animals die within a week of appearing obviously sick. Most people know to avoid wild animals that look strange or behave oddly, and to keep pets vaccinated. Fewer people know that, because infected animals can appear normal during the early stages of the disease, people should avoid direct contact with all wild animals, even those that appear normal and are behaving normally. Call your county or municipal Animal Control Agency if you notice a free-ranging dog or cat behaving unusually, and be prepared to describe the location and behavior of the animal. If you are bitten or injured by an animal, seek medical care immediately and ask your health care provider or your County Health Department about the risk for rabies. The County Health Department will work with your health care provider to determine whether the biting animal can be observed for signs of rabies for 10–14 days (most healthy appearing domestic animals), tested (most wildlife), or if rabies post-exposure treatment is recommended for the person who was bitten.

In humans, the period of time between infection and when symptoms appear (the incubation period) can range from 1 week to several months. The period of time between the onset of symptoms and death (the morbidity period) is usually 1 to 17 days. In humans early symptoms include headache, fever, irritability, insomnia, restlessness, anxiety, throat muscle spasms, and feelings of pain, burning, or numbness at the site of exposure. The victim may experience convulsions, paralysis, and unconsciousness before death occurs. Once symptoms appear, treatment is rarely successful. It is therefore critical to seek immediate medical care if rabies exposure is suspected.

## How can you limit the spread of rabies?

There are many steps you can take to reduce the chances of getting rabies, which are summarized in [Table 2](#).

**Pet owners:** Vaccinating your cats, dogs, ferrets, and horses will reduce the chances they will contract the virus, which in turn lowers the chances that you or your family members will get it from them. To reduce the chances that your pets

come into contact with rabid animals, keep all pets on a leash when they leave the yard. If you think your pet may have been bitten by an unvaccinated mammal, put on gloves before examining your pet for bite wounds to avoid direct contact between yourself and the saliva from the other animal. If you don't notice any bite wounds but saliva is present on the fur of your pet, wash your pet with soap and water to remove the saliva and call your veterinarian immediately for advice. Do not try to remove a bat from the mouth of your pet without wearing thick gloves, and contact your County Animal Control officer for advice on what to do with the bat.

**Homeowners:** Protect your home, yard, and workplace. Take steps to prevent wild mammals from entering your home or workplace. Exclude bats and raccoons from buildings by sealing potential entrances. Do not leave items in your yard that might attract wild mammals near your home and your pets. For example, pet food should not be kept in the yard, and all trash should be kept in covered containers that animals cannot open or knock over. Consider spaying or neutering your pet to prevent attracting stray animals, reduce risk of biting behavior, and limit the birth of unwanted animals that might become strays in the future. Do not trap wild or stray mammals and later release them in other locations, as this may spread disease. It is unlawful to relocate wildlife to public lands, and both a handling permit plus permission from the receiving landowner are required before wildlife can lawfully be released on someone else's private property. See <http://myfwc.com> for more information on restrictions regarding the relocation of wild animals.

**Sportsmen and women:** Many furbearing animals (foxes, coyotes, raccoons, skunks, and otter) are considered to be a high risk for rabies exposure. It is recommended that furbearer trappers receive a pre-exposure immunization to rabies. Pre-exposure vaccination does not mean that you do not need a post-exposure vaccination should you be exposed; it does, however, reduce the amount of treatment that you will need. Take precautions to ensure that live animals do not bite or scratch you. When handling dead animals or uncooked meat from wild game, be sure to wear gloves, handle sharp instruments carefully, and properly clean knives, other cleaning implements, and your hands thoroughly with hot soap and water when you are finished. A cut from a dirty knife when skinning one of these species would be considered an exposure. Should you be exposed in this manner, be sure to save the head of the carcass and call your County Health Department, who will send the animal to be tested for rabies if appropriate.

**A word about bats:** Avoid direct contact with bats. The only exception to this is if a bat is found inside your home or other building under one of the following conditions: (1) if someone in your household wakes up to find a bat in the room, or (2) he or she finds a bat in a room with an unattended baby or other individual (or pet) who is unable to communicate whether they had direct contact with the bat. In these situations, it is recommended that the County Health Department or County Animal Control office be contacted, and that the bat be captured and tested for rabies. Bats have small but sharp teeth that can bite through cloth. Capture with a rigid container such as a Tupperware container or coffee can is recommended if capture is necessary. In each of these situations, it is possible (although unlikely) that the bat could have bitten someone in the house while she or he slept without her or his notice. Bat bites can be felt but may not leave a visible mark, therefore absence of a visible wound does not rule out the possibility a bite occurred. Identifying where and how the bat got into the home is also important to prevent future bat entries.

**Sick or injured wildlife:** Do not bring sick, injured, or orphaned wild mammals into your home to care for yourself. Instead, call a local animal rehabilitation center, your veterinarian or County Animal Control. Visit the Florida Fish and Wildlife Conservation Commission's website (<http://myfwc.com/contact/nuisance-wildlife/>) for more recommendations on what to do with injured or orphaned wild animals.

## What should you do after a wild animal bite or scratch?

**A rabies exposure is any bite, scratch, or other situation in which saliva, brain/nervous material, or tears from a suspect or known rabid animal or a high-risk animal enters an open wound or comes in contact with mucous membranes** (FDOH 2014). In Florida high risk animals are raccoons, bats, skunks, coyotes, foxes, otters, or bobcats, or stray cats and stray dogs. If you get bitten or scratched by one of these animals; **OR** if you get saliva from a wild mammal into your mouth, nose, eyes, or a wound; **OR** if you receive a cut while processing the carcass of one of these animals, you should do three things:

1. First, immediately scrub the site of infection with soap and running water for 5–10 minutes.
2. Second, report to your doctor, a clinic, or an emergency room promptly so a medical professional can treat the wound and determine if you should receive post-exposure rabies prevention measures.

3. Third, call your County Health Department or County Animal Control Agency and give a detailed description of the animal you were in contact with plus information on your location at the time the incident occurred.

Remember that rabies can only be transmitted through contact with the saliva, tears, or brain/nervous tissue of an infected mammal. If you were bitten by a fish, amphibian, reptile, or bird, there is no reason to worry about rabies. Also, there is little need to be concerned about getting rabies by touching the fur, scat, urine, or blood of wild animals. (Although you could potentially contract other diseases by touching some of these things!) Similarly, there is no reason to fear getting rabies when a bat is simply seen flying indoors or out, as long as no one is asleep or otherwise unable to notice being bitten or scratched.

While the risk of exposure to rabies is low in the United States, the consequences are great. Obtaining prompt medical attention after a bite wound can save your life. This is especially true if you are bitten by a dog in a foreign country where dog rabies cases are more common than in the United States.

## Additional Sources of Information

Burridge, M. J., L. A. Sawyer, and W. J. Bigler. 1986. *Rabies in Florida*. Tallahassee: Health Program Office, Department of Health and Rehabilitative Services, State of Florida.

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Table 1. Number of individuals of each species that tested positive for rabies in Florida between 1992 and 2013.

Animal	# of individuals with rabies
Raccoon	2585
Fox	489
Bat	386
Cat	305
Dog	58
Bobcat	51
Skunk	28
Otter	26
Horse	25
Cow	2
Coyote	2
Beaver	1
Ferret	1

Table 2. Steps you can take to reduce the spread of rabies.

<p><u>Protect Your Pets</u></p> <ol style="list-style-type: none"><li>1. Vaccinate your pets and your livestock. Keep vaccinations current.</li><li>2. Keep your pets on a leash when they leave your yard.</li><li>3. Wash your pet to remove saliva if your pet comes into contact with a wild mammal.</li><li>4. Call your veterinarian if your pet is bitten by or comes into direct contact with a wild animal or a pet that you suspect is not vaccinated.</li></ol>
<p><u>Protect Your Home, Yard, and Neighborhood</u></p> <ol style="list-style-type: none"><li>1. Do not allow wild animals to get into your home or workplace.</li><li>2. Do not leave pet food outdoors that could lure wildlife with rabies into your yard.</li><li>3. Do not leave uncovered trash outdoors that could attract wildlife with rabies to your home.</li><li>4. Do not contribute to the spread of the disease by relocating wildlife that could have rabies.</li><li>5. Spay or neuter your pet to reduce the number of unwanted pets that may become strays.</li></ol>
<p><u>Protect Yourself</u></p> <ol style="list-style-type: none"><li>1. Do not pet or touch wildlife or strays.</li><li>2. Keep your distance from wild animals that are acting strangely (i.e., those that seem especially aggressive or particularly friendly, or that are active at an unusual time of day, or that are in a place you wouldn't normally expect them to be).</li><li>3. Notify wildlife rehabilitators when you find injured mammals rather than caring for them yourself.</li><li>4. Seek prompt medical care if you are bitten or injured by an animal, and ask your health care provider or County Health Department about your risk for rabies.</li></ol>