

Rabies in Ohio

2010 Annual Summary



Zoonotic Disease Program
Bureau of Infectious Diseases
Ohio Department of Health

Rabies Overview

In 2010, 3,641 animals from Ohio were tested for rabies. Testing was conducted by three laboratories:

- The Ohio Department of Health Laboratories (ODHL) tested public health specimens (e.g. suspect animals that exposed humans or pets/domestic animals).
- The United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Service (USDA APHIS WS) laboratories tested sick and dead wildlife collected for raccoon-rabies variant (RRV) surveillance in northeast and eastern Ohio.
- The Centers for Disease Control and Prevention (CDC) laboratories both confirmed USDA APHIS WS rabies positive animal samples and conducted rabies variant identification on rabies confirmed ODHL samples.

Forty-seven animals from Ohio tested positive for rabies in 2010, the same number as in

Table 1. Rabies positive animals in Ohio, 2010, compared to the prior 10 year average

Animal	2010		2000-2009	
	Total	% Positive	Avg Num/Year	Avg % Positive
Bats	41	5.5%	46	5.4%
Raccoons	2*	0.3%	11	0.8%
Skunks	3*	2.8%	1.8	1.8%
All Other	1*	.05%	1.1**	.03%
* all RRV positive	** cat (1), cow (1), coyote (2), fox (2), groundhog (1), horse (3) and opossum (1)			

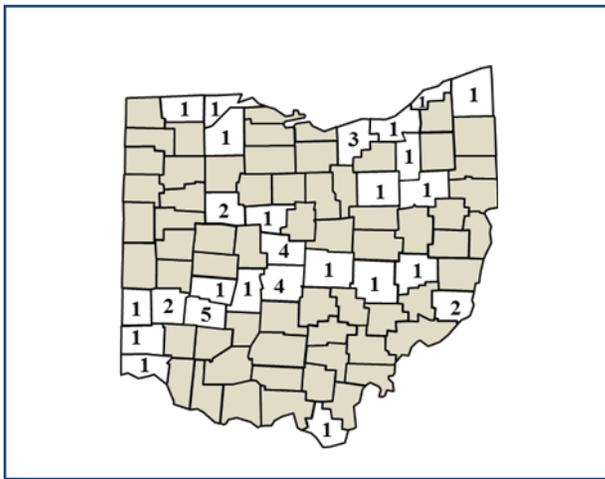
2009. Forty-one of those animals were bats (87 percent), three were skunks (7 percent), two were raccoons (4 percent) and one was a cow (2 percent). By comparison, 43 bats, one raccoon, and three skunks were confirmed rabid in 2009. In 2010, incidence of rabies in bats and skunks was similar to the 10 year average, however rabies in raccoons was significantly lower (Table 1).

Rabies in Bats

In 2010, 41 of 752 (5.5 percent) bats tested by ODHL were rabid (Table 1). Ohio's local health departments (LHDs) reported 54 people were bitten or otherwise potentially exposed to these bats and 50 of those individuals started rabies post-exposure prophylaxis (PEP). The largest exposure event involved nine people in Delaware County when a rabid bat was found in a home. The family happened to have visiting relatives at the time, and both families sought treatment.

In addition, 15 of the rabid bats exposed 18 dogs, 16 of which were quarantined, one was euthanized and one was lost to followup. Sixteen cats were exposed and of those, 10 were quarantined, four were euthanized and two outcomes are unknown. Distribution of rabid bats in Ohio continues to be sporadic with 26 counties reporting at least one rabid bat in 2010.

Figure 1. Rabies in Bats, 2010 (N=41)



Greene County had the most confirmed rabid bats, with five, followed by Franklin and Delaware counties with four.

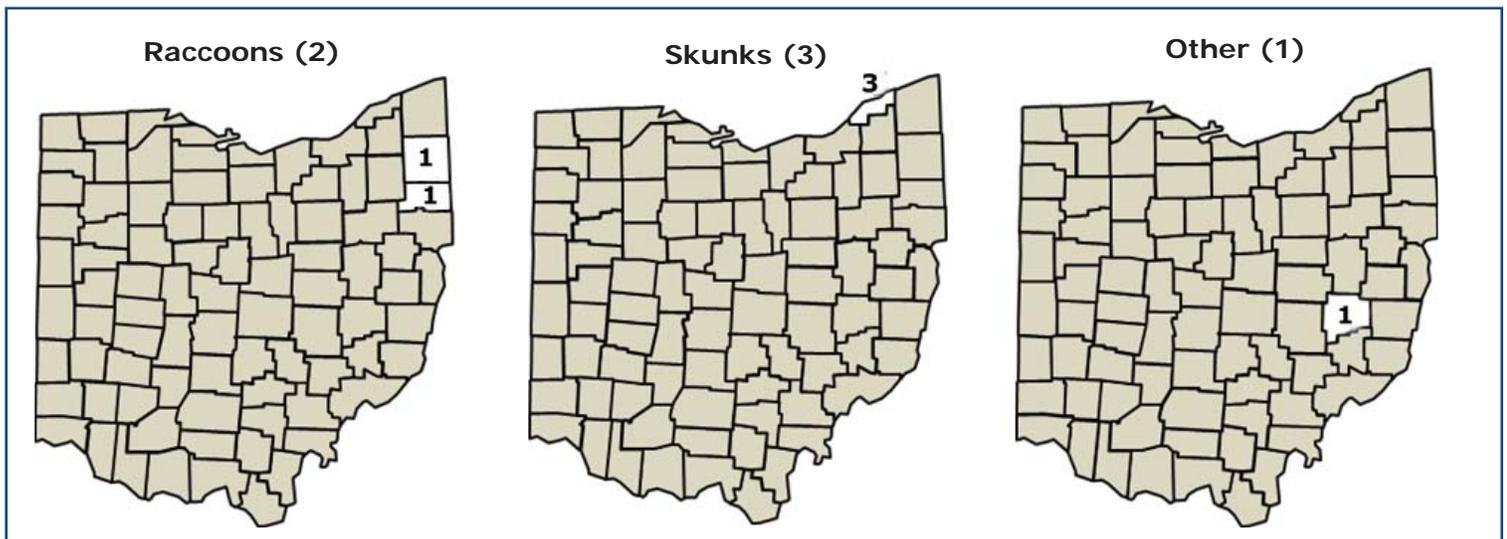
Bat rabies is present throughout the state (Figure 1) and household pets frequently are the conduit to human exposures. For this reason, rabies vaccination of companion animals is an important strategy for human rabies prevention. In addition, all human-bat interactions should be medically evaluated, as bats have been responsible for the majority of human fatalities due to rabies in the U.S. Between 1995 and 2010, 31 of 42 human fatalities (73.8 percent) from rabies in the U.S. were from bat-related rabies variants.

Raccoon-rabies Variant (RRV)

All the confirmed rabid terrestrial animals in Ohio were infected with the RRV. The two raccoons (Figure 2) from Mahoning and Trumbull Counties were found within 1.4 miles of the Pennsylvania border in the endemic area where raccoon rabies first entered Ohio in the late 1990's. There were no human or animal exposures. All three of the skunks came from Lake County. One skunk exposed a person and two dogs. The other two skunks and one of the raccoons were submitted as part of an ongoing enhanced RRV surveillance effort to collect and test animals that are acting unusual, are sick or injured, or were found dead. USDA APHIS WS tested 559 enhanced-surveillance animals in 2010.

Enhanced rabies surveillance is part of a joint ODH and USDA APHIS WS program to contain RRV in northeast and eastern Ohio. Surveillance information is used to target vaccination of wildlife using an oral rabies vaccine (ORV) bait and, in areas surrounding known positive animals, an injectable rabies vaccine on trapped animals as part of a trap-vaccinate-release program. Ongoing wildlife vaccination along Ohio's eastern border has created a barrier of immunized animals, intended to prevent additional incursion of RRV into Ohio from surrounding states where the virus is prevalent. In 2010, 765,353 vaccine-laden baits were distributed over 11,240 square kilometers (4,340 square miles)

Figure 2. Raccoon-rabies variant in Ohio Animals, 2010



in 14 Ohio counties. For more information on Ohio's raccoon rabies prevention efforts, go to <http://www.odh.ohio.gov/odhPrograms/dis/zoonoses/rabies/orv/orv1.aspx>.

The most unusual incident involving a rabid animal occurred at the end of December 2010 involving a six-week old calf from Guernsey County (Figure 2). Fortunately, the animal caretakers recognized that the calf's behavior and clinical signs were unusual. The farm contacted a local veterinarian who suspected rabies and sent brain tissue to the Ohio Department of Agriculture and Health Laboratories in Reynoldsburg for testing. ODHL confirmed the rabies diagnosis on December 27, 2010. Clinical rabies in an animal so young is very unusual, especially since it had been housed in a modern, closed feeder calf operation where exposure to potentially rabid wildlife was unlikely.

The Guernsey County Health Department worked to identify the individuals who may have been exposed to the calf. The Ohio Department of Agriculture and USDA APHIS Veterinary Service staff placed the facility where the calf was housed under quarantine on December 28, 2010. This calf had been individually crated with minimal opportunity to expose other animals; however, it was allowed to walk freely in the aisle while the caretakers tried to determine the cause of illness. As a precaution, 62 calves from that section of the barn were euthanized.

On January 5, 2011, the Centers for Disease Control and Prevention (CDC) confirmed that the calf was infected with the RRV, which while common in Pennsylvania and the Eastern United States, had never been found in Guernsey County. The LHD and ODA were able to trace the calf's origin to a farm and auction in south central Pennsylvania, a known endemic area for RRV. Though it would have been less than a week old, the calf was most likely exposed before it came to Ohio in early November 2010. Since the state of exposure cannot be absolutely confirmed, USDA APHIS WS is working with the Guernsey County Health Department to plan for enhanced surveillance for RRV in the area during 2011.

This incident is a reminder that even though current raccoon-rabies prevention efforts have been successful, RRV remains a significant threat from the Eastern U.S. and most notably from the neighboring states of Pennsylvania and West Virginia. Pennsylvania reports more rabid domestic animals than any other state. In 2010, 410 confirmed cases of animal rabies were reported in Pennsylvania; all but 29 were RRV.

Even with this persistent level of rabies challenge on the eastern Ohio border, the ORV and rabies prevention program's immune barrier has been sustained for over a decade. Ohio's success to contain raccoon-rabies and to keep it from spreading throughout the state is due to the combined coordinated effort of local, state and federal cooperators.

Visit <http://www.odh.ohio.gov/odhPrograms/dis/zoonoses/rabies/rab1.aspx> for more information about rabies in Ohio.

Figure 3. Oral Rabies Vaccine Baits



Ohio Rabies Background

In Ohio, there are three rabies variants circulating among our wildlife: bat, skunk and raccoon. The north central skunk-rabies variant has been present in Ohio for decades. Raccoon-rabies variant (RRV) first moved into Ohio in the late 1990s and is localized to north and eastern Ohio. Bat rabies can be found anywhere in the state; it is sporadic and geographically dispersed since bats fly and migrate. Each variant prefers a specific animal reservoir, but all variants can infect humans and other mammals. For example, a skunk with RRV can cause rabies in a human, dog, cat, horse, goat, etc.

Infection with any variant of the rabies virus affects the nervous system of mammals and the disease is usually fatal. It is transmitted when saliva from an infected animal comes in contact with an open wound or mucous membrane. Taking weeks to months, the virus travels to the brain where it causes progressively severe symptoms that may include anxiety, restlessness, confusion, agitation, incoordination, difficulty swallowing, seizures, and death.

Ohio has not had a human case of rabies since 1970, in large part due to the concerted efforts of public health and medical professionals. Each year in the United States, an average of three people die from rabies, usually from bat variants. Globally, the number of human deaths from rabies is underreported; in Africa and Asia, roughly 55,000 people die each year. The CDC reports that over 99% of human rabies cases

are due to the canine-rabies variant, which is no longer present in the United States due to effective animal control and vaccination efforts. For more background on rabies, recommendations and programs to control rabies in the United States and Ohio, please visit the web sites in Table 2.

In humans, treatment is effective only if immunoglobulin and a series of vaccinations are administered beginning within days of an exposure. For this reason Ohio requires all animal bites be reported to the local health department (LHD) within 24 hours. Animal bite victims should consult with their doctor and promptly report the incident to their local health department so that appropriate decisions can be made to either test or quarantine the biting animal, or treat the victim. Rabies is almost always fatal once clinical symptoms appear and human disease can be prevented through prompt exposure evaluation, risk analysis and timely treatment when needed. Ohio's local health departments investigate more than 24,000 such animal bite incidents annually.

Ohioans can protect themselves from rabies by:

- Avoiding contact with wildlife and animals you do not know.
- Vaccinating dogs, cats and ferrets.
- Calling a doctor if bitten.
- Calling a veterinarian if a domestic animal is exposed to a wild animal or shows unusual illness or behavior.

Table 2. Where to learn more about rabies

Rabies Prevention & Control, Centers for Disease Control & Prevention http://www.cdc.gov/rabies/
Animal Rabies and Animal Vaccines and Rabies Compendium http://www.nasphv.org/Documents/RabiesCompendium.pdf
Oral Rabies Vaccination Wildlife Services, U.S. Department of Agriculture, Animal Plant Health & Inspection Service http://www.aphis.usda.gov/wildlife_damage/oral_rabies/index.shtml
World Rabies Day, Global Alliance for Rabies Control http://www.worldrabiesday.org/