# State of resources reporting

February 2007

# Rabies in Ontario

## What is Rabies?

Rabies is a disease that affects the nervous system of mammals. The virus that causes rabies is usually passed from one animal to the next through the bite or scratch from an infected animal. In Canada and the United States, foxes, raccoons, skunks and bats are the main transmitters of the disease.

Pets and domestic animals can also be infected with rabies and there is a chance that they may pass the disease on to humans.

Therefore, while rabies is not a resource itself, it is included in the ministry's state of the resources reports because it is a stressor on wildlife, pets and domestic animals and is a public health concern.

This report provides the general public with information about the state of rabies in Ontario and the province's Wildlife Rabies Control Program.

Through education, the public can play a role in controlling rabies in wildlife, and take direct measures to ensure that their own health and the health of their pets and domestic animals are protected.

### What are the different types of rabies in Ontario?

There are three types (strains) of rabies in Ontario:

- fox strain
- raccoon strain
- bat strain

All three strains can kill humans and other animals. While each strain can infect any mammal, fox (or Arctic) strain is carried mainly by fox and skunks; raccoon (or mid-Atlantic) strain is carried mainly by raccoons; and bat strain is carried mainly by bats.

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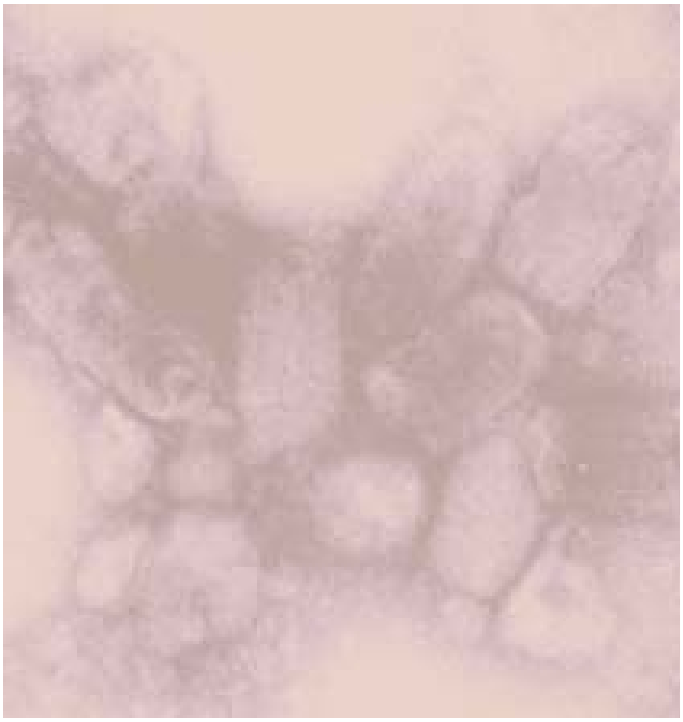
### What are the symptoms of rabies?

An animal normally develops symptoms of rabies within three to four weeks; however, it can take from two weeks to over a year. Once an animal exhibits the symptoms of rabies the disease is almost always fatal.

Infected animals may show the following symptoms:

- lose their fear of humans
- become paralyzed in their hind limbs
- drool
- show extreme aggression towards other animals or objects
- isolate themselves
- have a drooping head, sagging jaw, abnormal facial expressions and vocalizations
- gnaw and bite their own limbs



# Where did rabies come from?

## Fox Strain (Arctic Strain)

Fox strain rabies was the first strain to be diagnosed in Ontario. Its existence was initially confirmed in 1954 near James Bay in northern Ontario, and then it spread southwards throughout the rest of Ontario. By December 1955, fox strain had reached southern Ontario. Between 1958 and 1990 there was an average of 1,500 confirmed cases in the province each year, primarily in the south.

## Raccoon Strain (Mid-Atlantic Strain)

Raccoon rabies was originally reported in Florida in the late 1940s. By 1977, as a result of relocated, infected raccoons, it began spreading northwards through the Atlantic Coast states. In 1999, raccoon rabies crossed the St. Lawrence River from New York and entered southeastern Ontario.

## Bat Strain

Bat strain rabies was first diagnosed in Ontario in 1961. Despite large numbers of bats in southern Ontario, rabid bat cases are infrequent. Researchers estimate that less than two per cent of bats actually carry the rabies virus.

# How does Ontario control rabies?

- The Ministry of Natural Resources Rabies Research and Development Unit, working in partnership with other provincial and federal ministries, universities, and private industries, has been a lead agency in rabies research and control. This research aims to develop effective and economical methods to vaccinate wild animals against rabies, improve rabies monitoring programs, and increase our understanding of both the rabies virus and the role of wildlife in spreading the disease.
- This research has also led to the development of Ontario's Wildlife Rabies Control Program, which began in the mid 1980s.
- Rabies is controlled in Ontario's wildlife through one of two methods – vaccination or, in emergency situations, by the selective euthanization of wild animals.

## Vaccination

There are two ways that vaccinations are administered to wild animals in Ontario – through baits, which are eaten, or by manual injections. There is currently no vaccination method for bats because they are insect eaters and will not eat the vaccine baits used for other wild animals. International research is currently under way to develop a method for vaccinating bats.

## Baits

Vaccine-filled baits are used to vaccinate wild animals over a large area. Baits are distributed throughout the area by airplanes (Figure 1a) or on the ground. When a target animal eats or bites into the vaccine-bait (Figure 1b), the vaccine is absorbed in the mouth and they become immunized against the rabies virus.

While oral vaccines for immunizing raccoon and fox have been used since 1989, there has not been a similar vaccine to immunize skunks until recently. The Ontario Ministry of Natural Resources and partners have developed a new oral vaccine for skunks and, in 2006, began distributing this vaccine in southern Ontario.

Since 1989, approximately 18,500,000 rabies vaccine baits have been distributed in Ontario.

Figure 1(a): Rabies vaccine baits are dropped from aircraft over large areas.

Figure 1(b): The most common vaccine-bait system used in Ontario. The vaccine is embedded in the bait (in the centre) and is then distributed by airplanes or on the ground throughout an area. Photography by Adam McAllister.

## Manual Injections

When the area that needs to be vaccinated is smaller (typically less than 1,000 square km), vaccinations may be manually injected. Animals are trapped, injected with the rabies vaccine and then released on site (Figure 2). This method is called Trap-Vaccinate-Release (TVR).

## Euthanization

Ontario has a large raccoon population, especially in urban areas. There are approximately 1.1 million raccoons in southern Ontario alone, which makes it likely that people, pets, livestock and other wildlife may come into contact with raccoons.

To protect public and animal health, aggressive strategies are used to restrict the spread of raccoon strain rabies in Ontario. In emergency situations, these strategies sometimes involve euthanasia of raccoons and skunks within a localized area.

Figure 2. The Trap-Vaccinate-Release (TVR) method is another strategy used to help control the spread of rabies in Ontario.

When a case of raccoon strain rabies occurs in an area that has not been recently treated, raccoons and skunks within five km of the case may be euthanized. This occurs in order to quickly restrict the disease from spreading to other animals. Animals outside the five-km radius are vaccinated either through the TVR or bait methods.

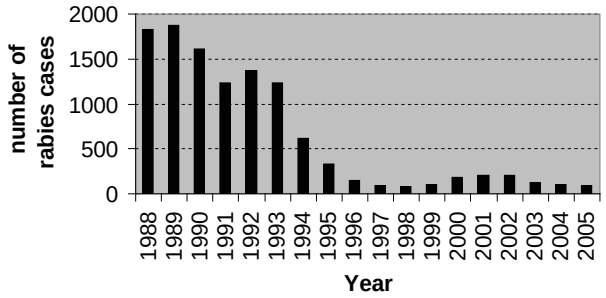



Figure 3. Total rabies cases per year since the implementation of the wildlife rabies control strategies.

# What is the current status of rabies in Ontario?

The number of rabies cases in Ontario has been reduced by 95 per cent since baiting began in 1989 (Figure 3). In 2005, 96 new rabies cases were reported in Ontario, down from the average 1,500 cases per year that were being reported between 1958 and 1990.

## Fox Strain

Before the Wildlife Rabies Control Program was implemented, thousands of fox strain rabies cases were reported each year.

Since the program's implementation, the number of fox strain rabies cases has been drastically reduced. In 2005, only 34 cases of fox strain rabies were diagnosed in Ontario. Many of these cases occurred in striped skunks which are now the main carriers of fox strain rabies in Ontario.

## Raccoon Strain

The raccoon rabies control program has kept the number of raccoon strain rabies cases to 132 since the introduction of the strain to Ontario seven years ago. As well, the program has successfully contained the strain to an area of approximately 50 km radius, thereby preventing its spread throughout southern Ontario (Figure 4).

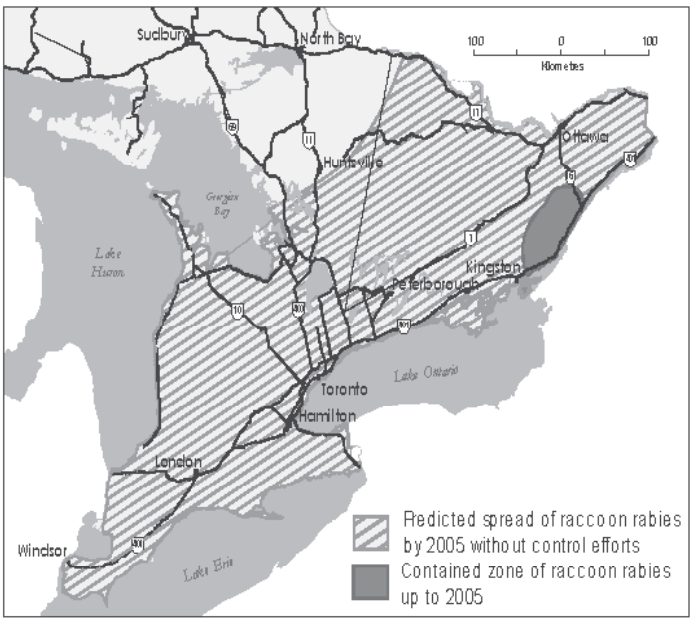



Figure 4.Predicted spread of raccoon rabies (hatched colour) if Ontario did not implement control strategies compared to the actual spread (solid colour) with control implemented.

## What is the outlook for rabies?

The Ontario government will continue to implement the Wildlife Rabies Control Program through the Ministry of Natural Resources' Rabies Research and Development Unit. Ongoing rabies research, monitoring and control efforts will improve understanding of this disease, lessen its effect on wildlife and reduce the threat to the health of pets, domestic animals and humans.

## What you can do to help control rabies?

- Have your pets vaccinated according to instructions from your veterinarian.
- Do not feed wild animals and warn your children to stay away from wild or stray animals.
- Discourage wild animals from taking up residence in your home (i.e., cover potential entrances such as uncapped chimneys, loose shingles, and openings in attics, roofs and eaves). (See Rabies Fact Sheets at http://rabies.mnr.gov.on.ca/facts.cfm).
- Do not trap and transport wild animals to a new location. It's illegal and you could be spreading diseases.
- Have all dead, sick or easily captured bats that have come in to contact with a human or pet tested for rabies. Do not touch the bat. Contact your local Canadian Food Inspection Agency for testing.
- If you or a member of your family has been in contact with a potentially rabid animal, immediately contact your local health unit, doctor, or visit your local emergency health care centre.

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## Information sources

The information provided in this document is based on data collected for the Wildlife Rabies Control Program, administered by the Ministry of Natural Resources, and from the diagnosis of rabid animals through the Canadian Food Inspection Agency.

More detailed technical information on rabies can be found on the Rabies Unit website. (www.ontario.ca/rabies)

## Related Information

- Ontario Ministry of Health Rabies Program (http://www.health.gov.on.ca/english/public/program / pubhealth/rabies/rabies_mn.html)
- State of Resources Reporting website (http://www.mnr.gov.on.ca/mnrsorr)

## Contact Information

For more information on the status of rabies in Ontario, please contact:

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# Rabies Information Update – 2010

Rabies in Ontario continues to decline in response to the Ministry of Natural Resources' (MNR) control efforts. The total number of confirmed cases of rabies has fallen by 18 percent since 2005, with 79 cases reported in 2008. This is the fifth time that there have been fewer than 100 cases reported annually in Ontario.

Of these 79 cases, 38 were diagnosed in bats (bat-strain rabies), with the remaining cases occurring in terrestrial mammals (fox-strain rabies). Most of the fox-strain rabies cases were either diagnosed in striped skunks or were suspected to have originated from striped skunks.

In April 2008, the MNR announced that raccoon-strain rabies has been eliminated from Ontario. There has not been a confirmed case of this strain in Ontario since September 2005. The ministry will continue to monitor raccoon-strain rabies to ensure early warning and treatment of possible new outbreaks.

Since 1989, over 20.4 million rabies vaccine baits have been dispensed in Ontario. Ontario now has one of the lowest incidences of rabies in North and South America. The ministry's Wildlife Rabies Control Program has been so successful that several states and provinces have adopted Ontario's practices.

While oral vaccines for immunizing raccoons and foxes have been used since 1989, there has not been a similar vaccine to immunize skunks until recently. MNR has been working in partnership with private industry, universities, and the federal government for the past 20 years on a vaccine that targets rabies in skunks, raccoons, and foxes. In 2006, MNR began distributing the new vaccine, ONRAB®, in southern Ontario. In wildlife species testing, ONRAB® appears to be effective on fox- and raccoon-strain rabies and is being used in Ontario for a fourth year to test its efficiency under field conditions. Over 4.5 million ONRAB® baits have been tested in New Brunswick, Quebec, and Ontario with very encouraging results.

## Information sources

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