

The Rabies Reporter

The Ministry of Natural Resources and Forestry
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The Rabies Reporter, a scientific newsletter about rabies research and control, is a joint effort of Wildlife Research and Monitoring Section, Ministry of Natural Resources and Forestry; the Rabies Laboratory at the Ottawa Laboratory (Fallowfield) of the Canadian Food Inspection Agency; and the Ministry of Health and Long-Term Care. We encourage readers to submit ideas for articles.

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Ontario rabies cases continue to drop in 2018

Rachel Gagnon, Ministry of Natural Resources and Forestry

The downward trend in Ontario's rabies cases continued in the first half of 2018: Only 40 cases compared with the 82 cases recorded during the same period last year. The January–June 2018 cases included 21 raccoons, 10 skunks, and 9 bats (Figure 1). Although cases were fewer, the enhanced surveillance zone expanded slightly due to several new cases detected at the periphery of the zone.

Raccoon strain: Mid-Atlantic raccoon strain cases steadily declined in the first 6 months of 2018. A total of 27 cases were detected in southwestern Ontario in the first half of this year, compared with 73 cases during the first half of 2017. The cases continued to cluster around Hamilton and included 14 raccoons and 4 skunks in Hamilton, 3 raccoons and 2 skunks in Niagara, 2 raccoons in Brant, 1 raccoon in Haldimand, and 1 raccoon in Norfolk. The raccoon strain cases stayed within about 50 km of the original December 2015 case; however, a raccoon case near Millgrove in Hamilton led to the surveillance area being expanded a further 3.5 km to the north. In response, an additional 7,404 baits were planned to be distributed in the summer.

Fox strain: Four Ontario fox strain cases were detected in the first half of 2018 compared with 6 cases during the first half of 2017. All 2018 fox strain cases were in skunks. Three were found in winter (2 in Waterloo and 1 in Huron counties). Spot treatments were conducted in April around these locations, with 57,104 baits distributed over 199 km². A case was detected in Elora in late May, which led to a 7.1 km expansion of the enhanced surveillance zone (Figure 2). MNRF conducted an oral rabies vaccine bait distribution flight on May 31, distributing about 19,300 baits by helicopter and ground crews and covering 64 km².

Bats: Nine bats tested positive for rabies from January to June this year, up from 4 rabid bats during this time last year. The bat cases were in Hamilton, Middlesex, Niagara, Ottawa-Carleton, Peel, Waterloo, and Wellington counties.

MNRF will continue enhanced surveillance and rabies control throughout 2018.

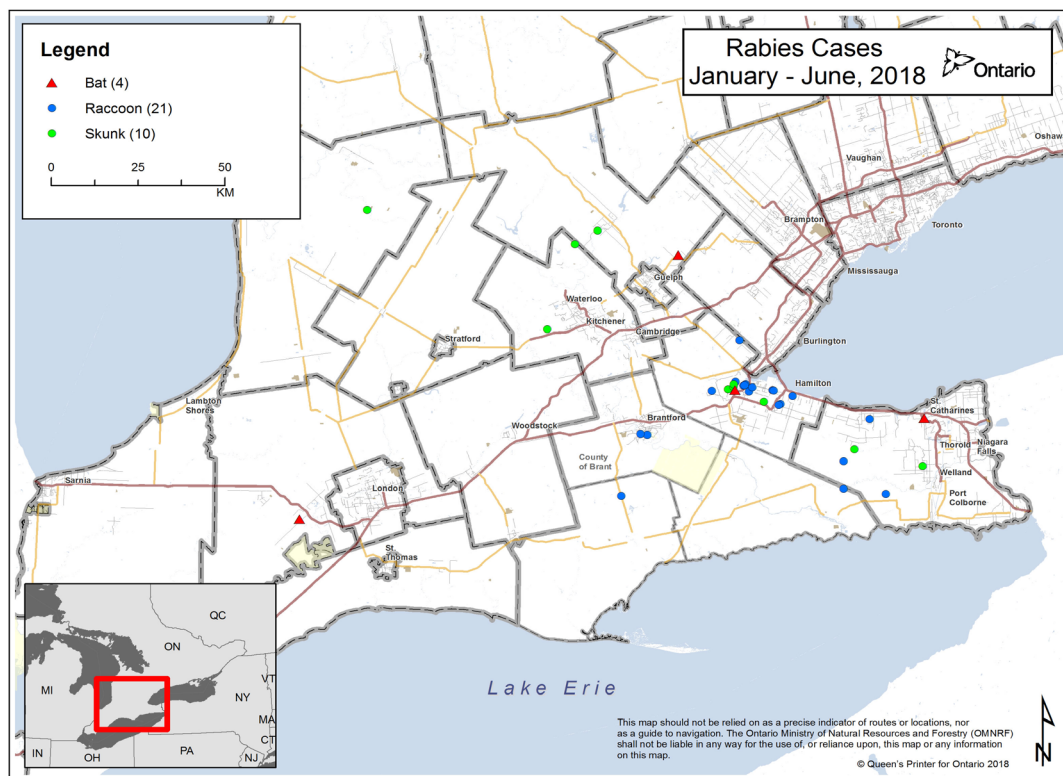


Figure 1. Rabies cases detected in southern Ontario from January–June 2018 totalled 35.

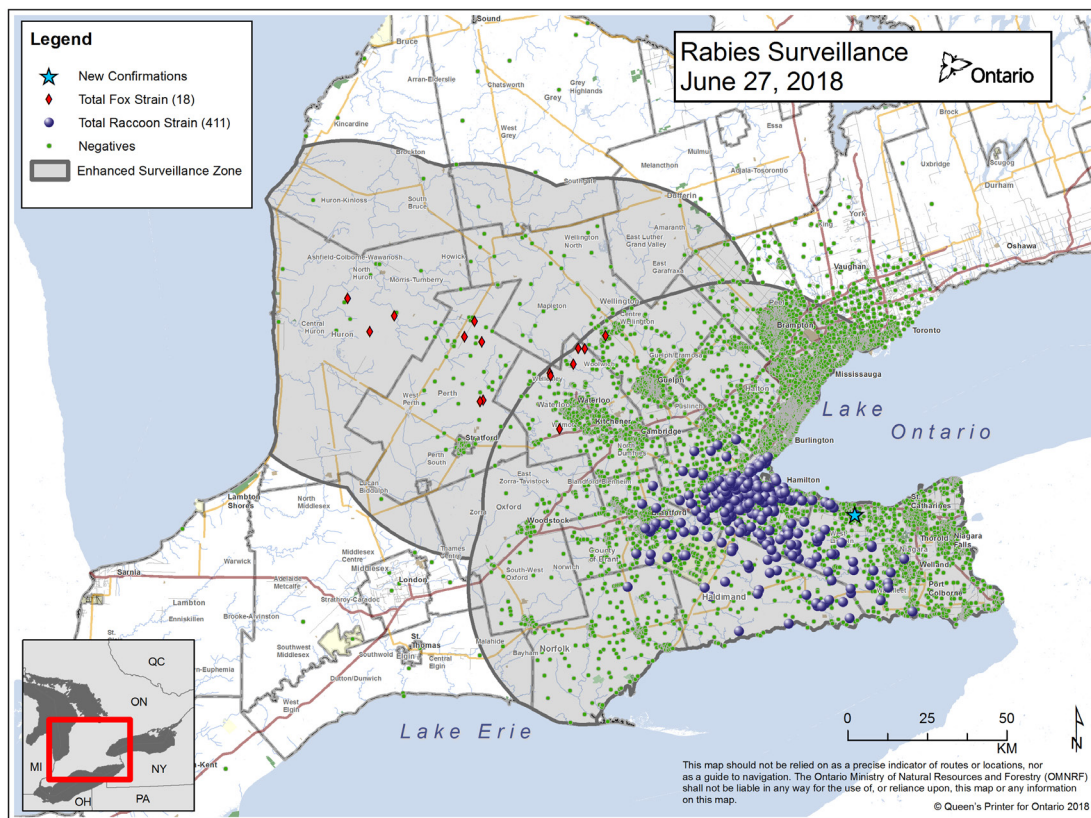


Figure 2. Total raccoon and fox strain rabies cases in southern Ontario from December 2015 –June 2018 and the surveillance and control zone.

Spring spot treatment baiting conducted in response to 5 winter cases

Rachel Gagnon, MNRF

Although animals are less active in winter, MNRF continues to test animals found dead for rabies from the surveillance area throughout the year. While surveillance continues in winter, oral rabies vaccines are not typically distributed because of decreased animal movements and potential freezing of baits. MNRF responds to winter cases by conducting localized baiting in the spring when temperatures have warmed up and animals are more active, which increases the chances of an animal coming across one of our vaccine baits. In 2018, 3 fox strain cases were confirmed in winter (February and March) in Elmira, St. Agatha, and Brussels, with 1 raccoon strain case detected at the periphery of the Hamilton outbreak in Millgrove in March.

On April 11–12, localized baiting was conducted in response to the 3 fox strain cases and the raccoon strain case. Aerial and handbaiting crews distributed 57,104 baits covering 199 km² (Figure 3).

In late May, a case of fox strain rabies was detected in Elora. As a result, the enhanced surveillance zone was expanded eastwards by 7.1 km. On May 31, MNRF responded by distributing 19,442 baits by helicopter and ground crews, covering 64 km².

These areas have been scheduled to be rebaited as part of the annual oral rabies vaccination zone in late summer/early fall. Rebaiting is necessary later in the year to ensure adequate vaccination of young of the year.

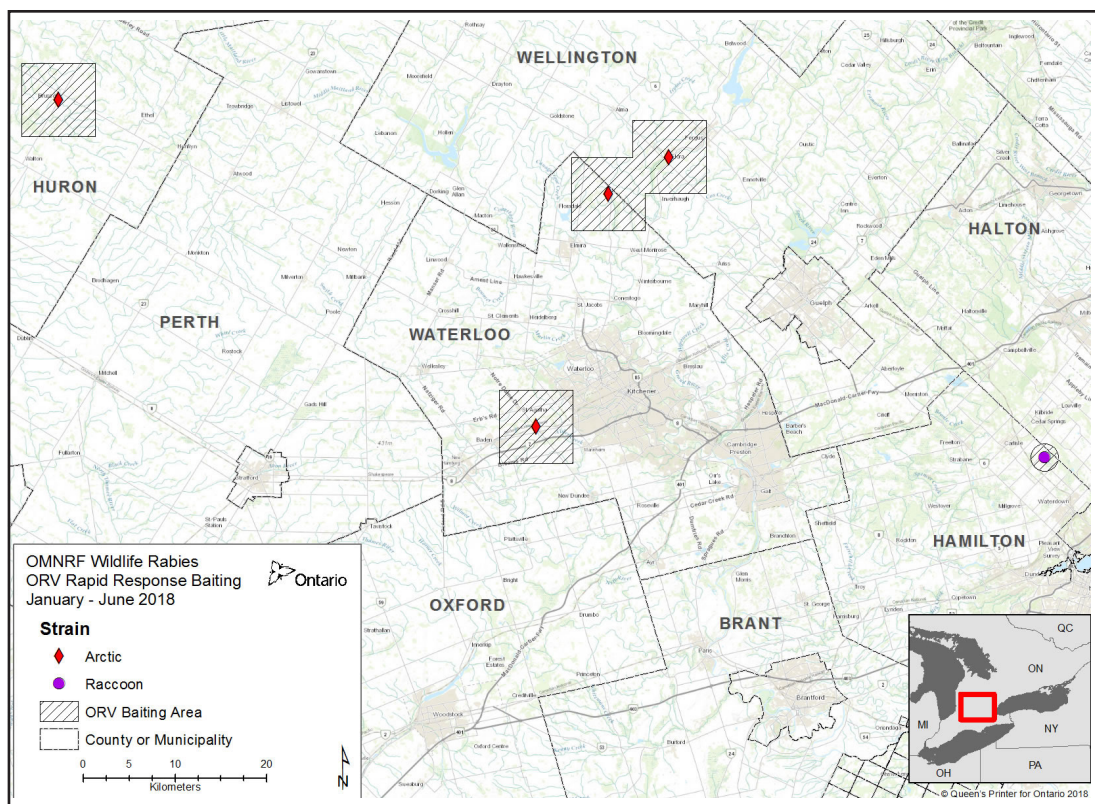


Figure 3. Spot treatments were conducted in April and May to address cases detected over the winter and spring.

Ontario's Rabies Program tests 10,000 samples using dRIT

Rachel Gagnon, MNRF

A relatively new rabies test called the Direct Rapid Immunohistochemical Test or dRIT is allowing rabies in wildlife to be confirmed faster and at a lower cost than previous methods. In fact, staff with MNRF's Rabies Program have now used dRIT to test more than 10,000 samples from animals suspected to be infected with this deadly virus or found dead within the rabies surveillance zone.

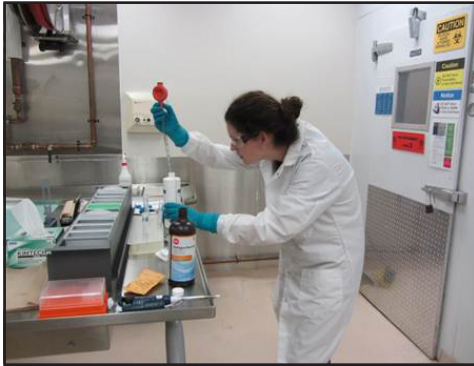


Figure 4. MNRF staff test wildlife samples using the Direct Rapid Immunohistochemical Test.

This test could be a game changer in global rabies control and is currently being used or evaluated in a number of countries around the globe. It is currently playing a critical role in assessing where rabies is present and how it is moving across the landscape in Ontario, informing our control operations and allowing us to rapidly respond to cases as soon as they are diagnosed. During this most recent outbreak, testing through dRIT has identified 97% of the positive cases of terrestrial rabies confirmed in Ontario to date.

FAT vs. dRIT

The Direct Fluorescent Antibody Test or FAT used by the Canadian Food Inspection Agency is considered the gold standard for rabies testing. It is not widely accessible however as it requires expensive fluorescence microscopy and specialized lab equipment and highly trained staff. The dRIT, on the other hand, involves using a much less costly light microscope and can be carried out with basic lab supplies and in a relatively simple lab (Figure 4). The U.S. Centers for Disease Control and Prevention (CDC) developed dRIT to allow suspect animals to be assessed quickly and accurately, especially in developing countries where funding and infrastructure would prohibit use of the more expensive testing methods. The CDC recognized that while human deaths from rabies in North America are rare, this disease is still a major global problem. The World Health Organization reports that tens of thousands of people die each year from rabies, most often through canine exposure. Extensive validation of the dRIT, which showed excellent performance in comparison with FAT, has led to its recent recognition as a primary diagnostic test for rabies by both the WHO and the World Organisation for Animal Health.

During the most recent rabies outbreak in Ontario, which began in December 2015, rabies program staff began using dRIT in conjunction with confirmation by FAT. The former is allowing staff to assess more animals, get results quickly and accurately, better assess the size and spread of the rabies outbreak, and make more effective management and control decisions. Any dRIT positive animals are sent on to the CFIA for confirmatory testing through FAT before notifying the local public health unit.

Testing using dRIT

Each week, the MNRF lab at Trent University in Peterborough receives between 60 and 120 samples from the rabies surveillance area, a buffer zone of 50 km around any terrestrial rabies cases. Numbers vary depending on the season. Targeted mammal species found dead in the zone can be submitted to MNRF for testing. MNRF partners help to collect and submit samples for testing in and outside the surveillance area.

Each week, lab staff test samples by creating an impression of brain tissue onto microscope slides. They then put the slides through a series of chemical baths and incubate the samples with a rabies-specific stainable antibody. Slides are viewed by light microscopy to determine the results: A negative sample turns blue; rose-red round masses mean the sample is positive for rabies (Figure 5). Positive samples are shipped to the Canadian Food Inspection Agency for confirmation using FAT. When new rabies cases are detected, MNRF notifies partners in the Ministry of Health and Long-Term Care; Ontario Ministry of Agriculture, Food and Rural Affairs; and local public health units, which investigate to ensure no members of the public were exposed to the rabid animal. Rabies maps on Ontario.ca are updated weekly to reflect the number and locations of the new cases.

Ensuring dRIT's accuracy

When MNRF began implementing dRIT, knowing the accuracy of results was crucial. So in 2016, researchers began a study to validate Ontario dRIT test results against FAT results.

They found that rabies-positive dRIT and FAT results agreed 98.8% of the time, while DRIT and FAT results for rabies-negative samples were in 100% agreement. MNRF staff then made 2 changes in staff training and diagnostic protocols, which improved the agreement rate for positive results to 100% since February 2016.

For more information about rabies in Ontario and the Rabies Program, and to see updated maps, visit the Rabies page on Ontario.ca

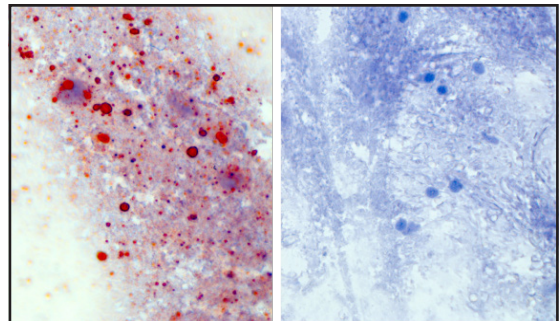


Figure 5. With Direct Rapid Immunohistochemical Test, if the sample turns red, the animal had rabies, and if it turns blue, the animal was rabies free.

How registered veterinary technicians are contributing to rabies surveillance in Ontario

Kristina Cooper, RVT Provincial Manager – OAVT Public Health Rabies Response Program

Since December 2015 the Ontario Association of Veterinary Technicians (OAVT) Public Health Rabies Response Program (RRP) has been the main service provider of rabies specimen collections and shipment for all of Ontario's Public Health Units (PHUs) in partnership with the Ministry of Health and Long-Term Care (MOHLTC). The majority of these cases involve human exposure to animal rabies suspects which are sent to the Canadian Food Inspection Agency's Rabies Laboratory for Rabies Fluorescent Antibody Testing (FAT).

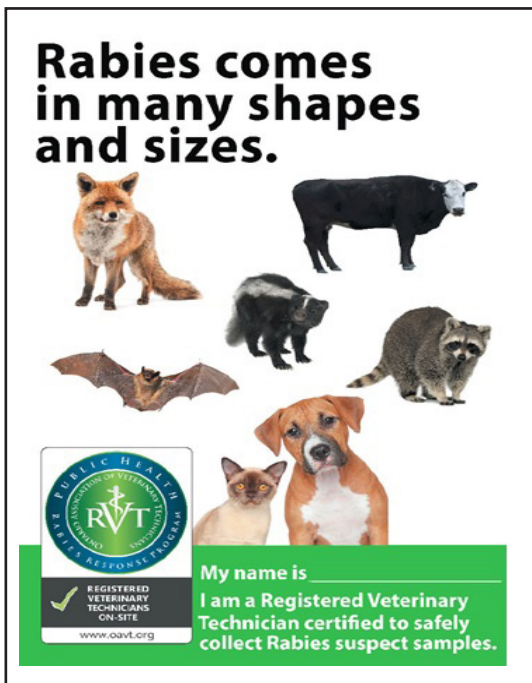


Figure 6. The Rabies Response Program created a post card for public awareness.

A pilot project is also currently underway with the OAVT RRP/MOHLTC and the Canadian Wildlife Health Cooperative (CWHC) for wildlife vector species and feral cats with no history of human or animal exposure that are suspicious of rabies (Figure 6). RVTs collect and ship these specimens to the CWHC Laboratory in Guelph where they undergo Direct Immunohistochemical Testing (dRIT) for rabies.

The OAVT RRP also help the Ontario Ministry of Natural Resources and Forestry (OMNRF) to provide rabies specimen collection and shipping services, for animals outside their regular surveillance area. Wild animals that are also suspicious of having rabies but have had no other human or animal contact. These cases also undergo Direct Immunohistochemical Testing (dRIT) for rabies at the OMNRF Laboratory.

Registered Veterinary Technicians (RVTs) in Ontario that work with the OAVT RRP are highly skilled professionals who have received their credentials after successfully completing a 2-3 year veterinary technology diploma program, a professionalism and ethics course, a national examination and have a clear criminal record. Those RVTs who wish to participate in the OAVT

RRP receive further training in rabies specimen collection techniques, the transportation of dangerous goods, WHMIS and Health and Safety Awareness and Accessibility Training. RVTs provide their services as independently contracted workers.

Rabies specimen collection requests are received by two RVT managers electronically at the OAVT RRP directly from PHU or OMNRF staff. Cases are then dispatched and coordinated out of the OAVT RRP office located in Guelph, Ontario to RVTs across the province. The OAVT RRP's goal is to dispatch an RVT to a collection location within one business day for the collection and shipping of the rabies specimen to the

appropriate laboratory for testing (CFIA, CWHC or OMNRF). The OAVT RRP then tracks these specimens through shipment to ensure that they arrive at their destinations and ensures the test results are returned promptly. Since the inception of the OAVT RRP Registered Veterinary Technicians have participated in close to 4300 rabies specimen collections.

As rabies continues to be active in Ontario the OAVT RRP also provides rabies educational support and access to rabies vaccine clinic listings in Ontario to veterinary hospital and animal shelter staff as well as the public through their webpages at www.oavtrrp.org.

RVTs play an interesting and important role in the surveillance of rabies in Ontario and pride themselves in being key players within the network of government ministries that work together to keep people and animals safe from rabies (Figure 7).



Figure 7. Two registered vet technicians pick up a specimen for rabies testing.

How we talk to the public about rabies

Rachel Gagnon, MNRF

MNRF continues to explore ways to get the word out about rabies in Ontario. Over the years, the ministry has used many avenues — newspapers, the rabies page on Ontario.ca, newsletters and fact sheets, partnerships (with veterinarians, public health units, etc.), and, of course, the enormously popular social media.

Social media allows information to reach the public quickly and allows us the ability to provide a quick response. In April 2018, MNRF posted on Facebook that spot treatment baiting would be conducted in some parts of the province. Within days, the post had been shared over 5,000 times, with about 5,000 reactions and over 470,000 people reached (Figure 8). Through this one post, MNRF was able to answer questions about spot treatments, rabies, and vaccines. People shared the post with friends in the baiting zone, and we reached people who may not have seen a newspaper ad or heard a local radio spot. As rabies control continues this year, MNRF will continue to use social media as one of its avenues for communication.

Theme days/months provide another opportunity for spotlighting rabies in Ontario via social media. May is Rabies Awareness Month, and this year MNRF posted information throughout the month, including how to stay safe, how Ontario is controlling the spread of rabies, and whom to call if someone suspects rabies in an animal (Figure 9). These posts were informative and popular.

The traditional news media is also useful for spreading the word about potential rabies cases in the province and provides an opportunity to respond to events we may not have heard about. In early February 2018, a citizen in Scarborough reported an encounter with a wild raccoon. Information was shared through the media in Toronto and word spread throughout the province. MNRF was able to

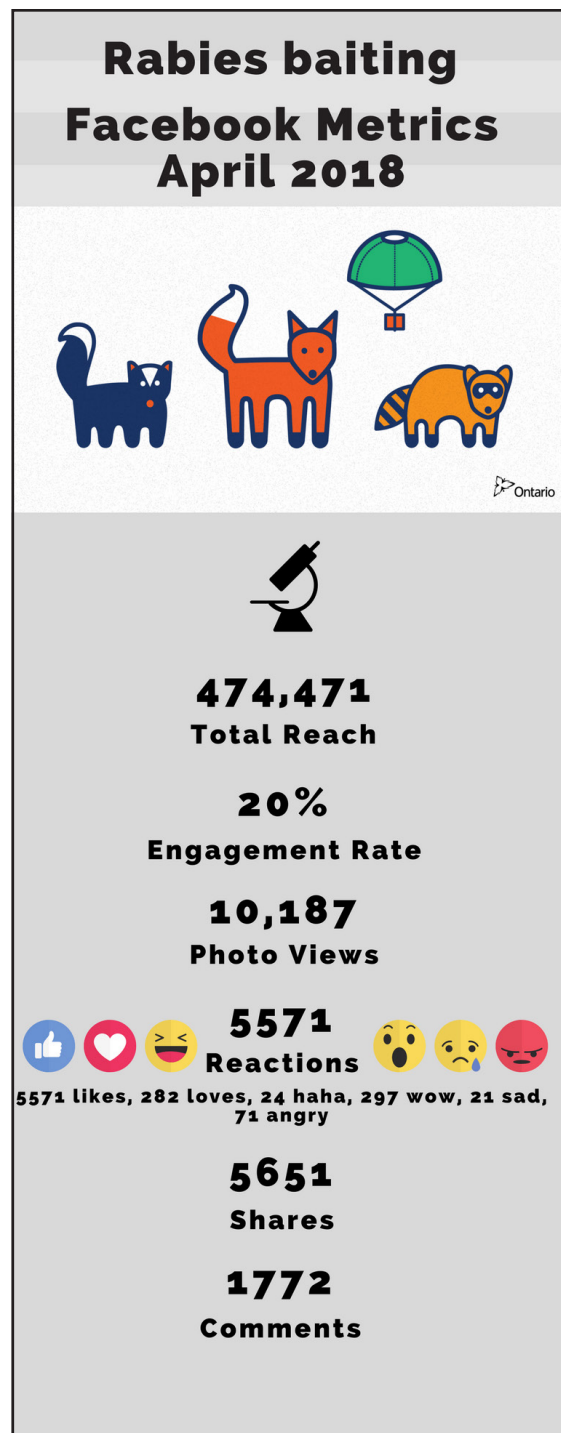


Figure 8. A post about baiting on MNRF's facebook page had impressive engagement statistics.

obtain the raccoon for testing and confirm that it was negative for rabies. Results showed the raccoon had canine distemper, which is common in southern Ontario and shares some symptoms of rabies, but is generally not a human health concern.

MNRF is always working on ways to improve how the public is informed about rabies and will continue to work with partners and others on public education.



Figure 9. Throughout May 2018, MNRF presented Facebook posts with the hashtag #rabiesawarenessmonth.

MNRF's Rabies Program says farewell (sort of) to Kevin Middel...

Congratulation to Kevin Middel on his new role as coordinator with the Wildlife Research and Monitoring Section.

As Kevin moves on to his new position we would like to thank him for his hard work and dedication to the Rabies Control Program as Rabies Science Operations Supervisor. Leading a provincial program of this scale is demanding and involves overseeing many projects and numerous staff. Kevin became the lead when the rabies outbreak began in October 2015, and his calm demeanour and hardworking nature, made him perfect for the position. Kevin worked long hours and was able to adapt with the ever going changes and surprises that could present themselves on any given day. Kevin will be missed by staff that worked with him.



Kevin has worked in wildlife research for over 20 years, studying various topics including the effects of climate change on polar bears. In his new role he will oversee research on a variety of topics including the effects of climate change on mammals, ecological movement and more. Kevin's hard work and experience make him a great fit in his new role and we wish him all the best.

...and welcomes Larissa Nituch as the new rabies science operations supervisor!

Larissa Nituch has succeeded Kevin Middel as rabies science operations supervisor. She has been involved with the rabies program for the past 10 years in various capacities, such as serology projects, trap-vaccinate-release, and baiting operations.

She has worked with the ministry's Wildlife Research and Monitoring Section in many roles (graduate student, intern, technician, biologist, and senior technician) and in a diversity of other programs. She has also held several positions in different MNRF divisions, gaining experience in operations and policy. Her most recent work has been as a senior wildlife technician with the section, leading the chronic wasting disease surveillance and airboat waterfowl programs. She was also involved in work on wildlife diseases such as epizootic hemorrhagic disease, avian influenza, and rabies. Her dedication, hardworking nature, and approachability make her ideal for this position. Congratulations, Larissa!



Animal Rabies Report: January to June 2018

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Animal Rabies Report: January to June 2018

Animal Type	Fox			Raccoon			Skunk			Other wildlife			Bat			Dog			Cat			Livestock			Totals		
County or Region	#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative	
		18	17		18	17		18	17		18	17		18	17		18	17		18	17		18	17		18	17
Southern																											
Hamilton				14	14	24	4	4	14				1	1							1				19	19	39
Haldimand				1	1	5			1																1	1	6
Norfolk				1	1																				1	1	0
Brant				2	2	5																			2	2	5
Niagara				3	3	12	2	2	2				1	1	1										6	6	15
Elgin																									0	0	0
Oxford																									0	0	0
Middlesex													2	2	1										2	2	1
Lambton																									0	0	0
Kent																									0	0	0
Essex																									0	0	0
Northern																											
Muskoka																									0	0	0
Parry Sound																									0	0	0
Nipissing																									0	0	0
Sudbury																									0	0	0
Cochrane																									0	0	0
Timiskaming																									0	0	0
Algoma																									0	0	0
Thunder Bay																									0	0	0
Rainy River																									0	0	0
Kenora																									0	0	0
Regional Totals																											
Eastern	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	2	0
Central	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Western	0	0	1	0	0	4	4	4	6	0	0	0	3	3	1	0	0	0	0	0	0	0	0	0	7	7	12
Southern	0	0	0	21	21	46	6	6	17	0	0	0	4	4	2	0	0	0	0	0	1	0	0	0	31	31	66
Northern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	10	10	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0

Note for this quarter: the bats were big brown bats



Column Legend

: Cases from Jan 2018 – Jun 2018
 18: Cases from Jan 2018 – Jun 2018
 17: Cases from Jan 2017 –Jun 2017

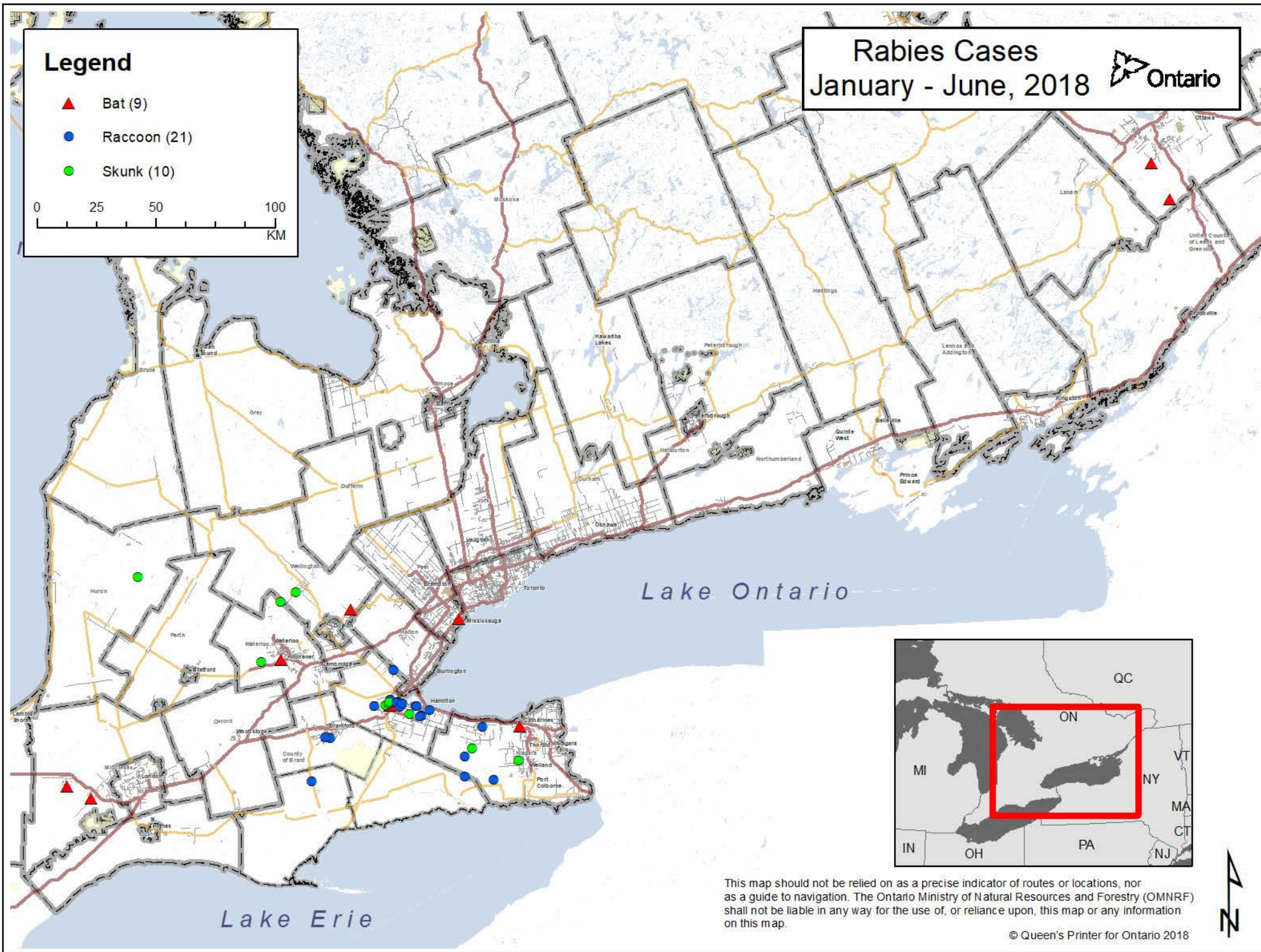


Legend

- ▲ Bat (9)
- Raccoon (21)
- Skunk (10)

0 25 50 100
KM

Rabies Cases January - June, 2018



This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Natural Resources and Forestry (OMNRF) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.

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Animal Rabies Report: January to March 2018

Animal Type	Fox		Raccoon		Skunk		Other Wildlife		Bat		Dog		Cat		Livestock		Totals		
County or Region	#	Cumulative	#	Cumulative	#	Cumulative	#	Cumulative	#	Cumulative	#	Cumulative	#	Cumulative	#	Cumulative	#	Cumulative	#
		17		17		17		17		17		17		17		17		17	
Eastern																			
Stormont, Dundas & Glengarry																	0	0	0
Prescott-Russell																	0	0	0
Ottawa-Carleton																	0	0	0
Renfrew																	0	0	0
Lanark																	0	0	0
Leeds and Grenville																	0	0	0
Frontenac																	0	0	0
Lennox & Addington																	0	0	0
Central																			
Hastings																	0	0	0
Prince Edward																	0	0	0
Northumberland																	0	0	0
Victoria																	0	0	0
Haliburton																	0	0	0
Peterborough																	0	0	0
Durham																	0	0	0
York Region																	0	0	0
Toronto																	0	0	0
Simcoe																	0	0	0
Western																			
Peel																	0	0	0
Halton						1											0	0	1
Dufferin																	0	0	0
Wellington									1	1							1	1	0
Waterloo					2	2											2	2	0
Perth																	0	0	0
Grey																	0	0	0
Bruce																3	0	0	3
Huron					1	1										1	1	1	1

Column Legend

: Cases from Jan 2018 – Mar 2018

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Animal Rabies Report: January to March 2018

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	#	18	17	#	18	17	#	18	17	#	18	17	#	18	17	#	18	17	#	18	17	#	18	17	#	18	17
Southern																											
Hamilton				8	8	11	3	3	7				1	1							1				9	9	19
Haldimand-Norfolk				1	1	1			1																1	1	2
Brant				1	1	5																			1	1	5
Niagara				1	1	2			1				1	1											2	2	3
Elgin																									0	0	0
Oxford																									0	0	0
Middlesex													1	1	1										1	1	1
Lambton																									0	0	0
Kent																									0	0	0
Essex																									0	0	0
Northern																											
Muskoka																									0	0	0
Parry Sound																									0	0	0
Nipissing																									0	0	0
Sudbury																									0	0	0
Cochrane																									0	0	0
Timiskaming																									0	0	0
Algoma																									0	0	0
Thunder Bay																									0	0	0
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Central	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Western	0	0	0	0	0	0	3	3	1	0	0	0	1	1	0	0	0	0	0	0	0	0	4	4	4	4	5
Southern	0	0	0	11	11	19	3	3	9	0	0	0	3	3	1	0	0	0	0	0	1	0	0	0	17	17	30
Northern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	11	11	19	6	6	10	0	0	0	4	4	1	0	0	0	0	0	1	0	0	4	21	21	35

Notes for this quarter: The bats were big brown bats.

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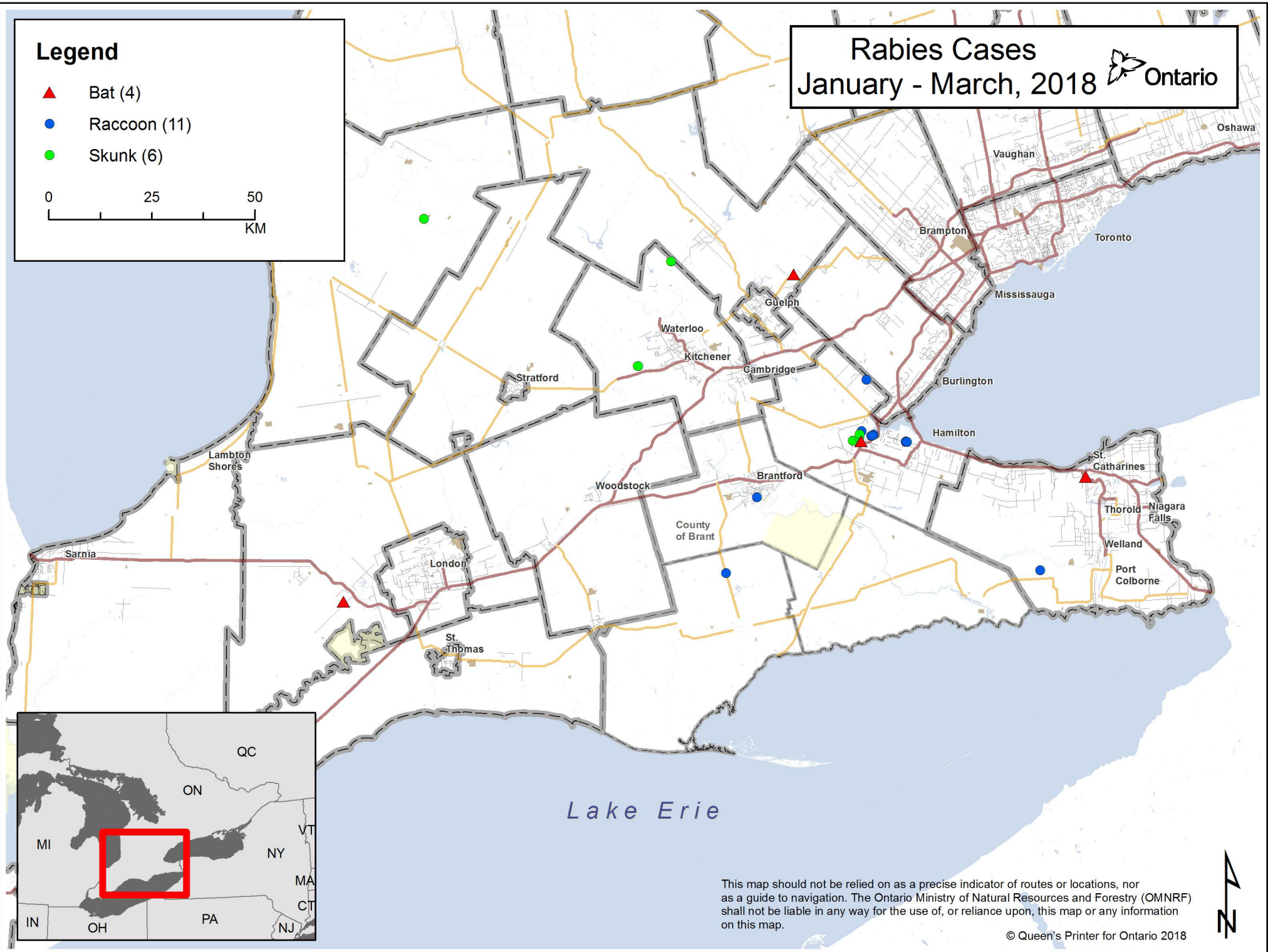


Legend

- ▲ Bat (4)
- Raccoon (11)
- Skunk (6)

0 25 50
KM

Rabies Cases January - March, 2018



Lake Erie

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