

The Rabies Reporter

The Ministry of Natural Resources and Forestry
MNRF Publication 51709, Volume 28, Issue 2
July - December 2017

The Rabies Reporter, a scientific newsletter about current issues in rabies research and control, is a joint effort of the Wildlife Research and Monitoring Section of the Ontario Ministry of Natural Resources and Forestry; the Rabies Laboratory at the Ottawa Laboratory (Fallowfield) of the Canadian Food Inspection Agency; and the Ontario Ministry of Health and Long-Term Care. Articles for Future issues will be welcomed by the editor. The Rabies Reporter is not refereed, and should be cited in papers intended for refereed journals. Send contributions, letters and inquiries to: rabies@ontario.ca

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2017 cases down by half from previous year

Rachel Gagnon, Ontario Ministry of Natural Resources and Forestry

There were a total of 149 diagnosed rabies cases in Ontario in 2017 which is a significant decrease from 2016.

This year saw a significant decrease in the number of rabies cases when compared to 2016. In one year Ontario went from 288 confirmed cases to 149, which is more than a 50% decrease. Rabies cases in Ontario also decreased from the first to the second half of the year, with 82* cases in the first half and 67 cases in the second half of the year (found in 36 raccoons, 14 skunks and 17 bats).

Four additional cases of fox strain rabies were detected in Ontario in the second half of 2017. All cases were found in skunks; 2 in the Waterloo area, 1 in Perth County and 1 in Huron County. These additional cases brought the total cases of fox strain rabies for the year up to 10.

Raccoon strain rabies cases continued to decline in the last 6 months of 2017. Forty-six cases were detected between July - December, and remained within 50 km of the original case found in 2015, the same time period last year there had been 130 confirmed cases. The majority of rabid raccoons (21) and skunks (5) with raccoon strain rabies continued to be found in the Hamilton area. Halton had 4 raccoon cases and 4 skunk cases, Haldimand had 1 raccoon and 1 skunk case, Niagara area had 7 rabid raccoons and Brant County had 3 rabid raccoons. Neither Brant nor Niagara had a rabid skunk in the second half of the year.

There were a total of 20 rabid bats this year compared to 29 the previous year. Seventeen of the bats were found in between July and December. All bats were big brown bats, and were located throughout southern Ontario. Grey County had 3 rabid bats while the rest of the counties saw one each and included: Bruce, Durham, Elgin, Halton, Hamilton, Hastings, Kent, Leeds & Grenville, Ottawa - Carleton, Owen Sound, Simcoe, Waterloo, Wellington and, York.

The Ministry of Natural Resources and Forestry (MNRF) will continue its enhanced surveillance and rabies control efforts throughout 2018 and for at least 2 years past terrestrial rabies elimination. Rabies is considered eliminated after 2 years of monitoring without a new case detected.

Rabies Control Operations in Ontario

Rachel Gagnon, Ontario Ministry of Natural Resources and Forestry

The MNRF continued its effort to control and contain the rabies virus in southern Ontario. In 2017, there were a total number of 149 rabies cases in Ontario (Figure 1), less than half the number of cases detected the previous year. All terrestrial cases were found within the enhanced surveillance zone, however the cases were more widely distributed than in 2016 and did cause the surveillance area of both fox and raccoon zones to expand slightly. Throughout 2017, MNRF and partners continued to focus on oral rabies vaccine ONRAB® distribution and enhanced surveillance within 50 km of any positive cases. Enhanced surveillance focused on the collection of sick, strange acting or dead wildlife for rabies testing.

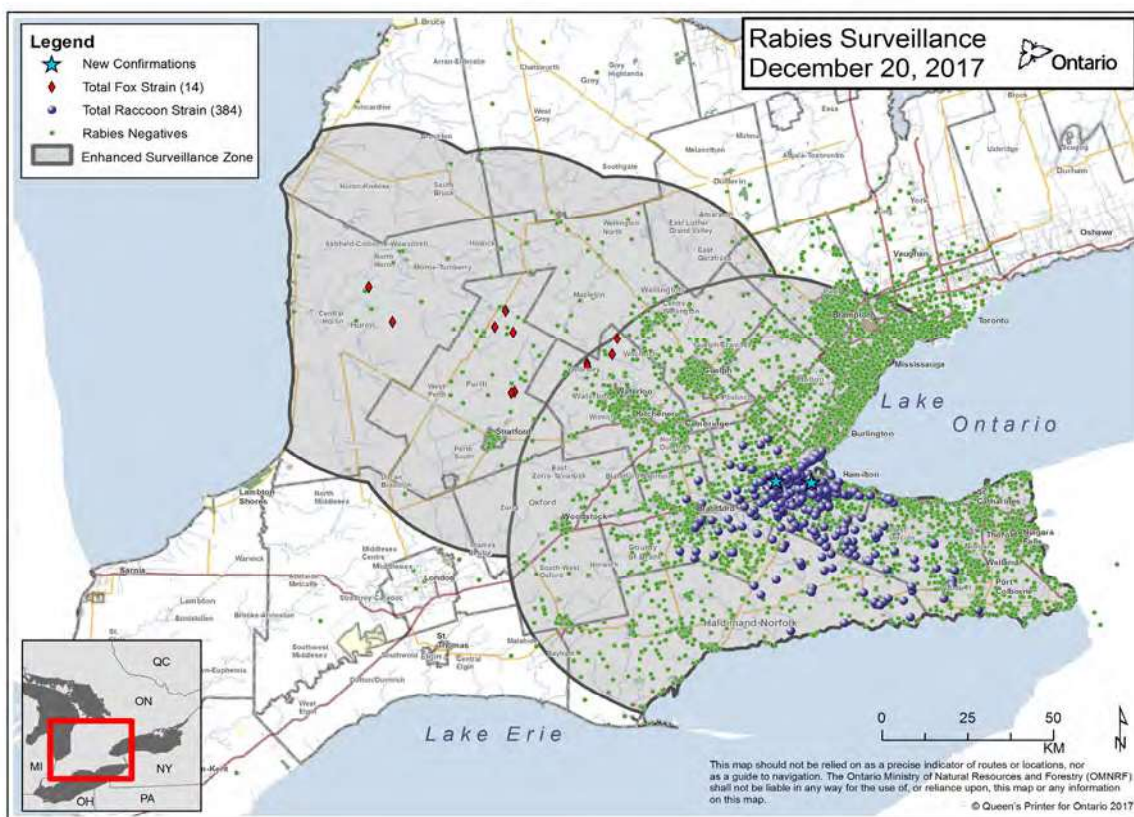


Figure 1. Rabies surveillance and control zone in Ontario and rabies cases from December 2015 - December 2017.

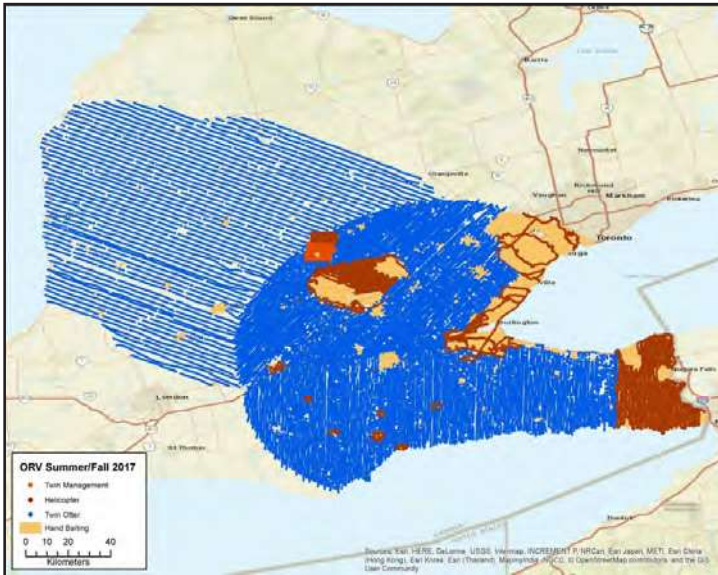
Ontario's wildlife rabies control program is primarily based on the distribution of ONRAB® baits. In 2017, 1.2 million baits were distributed in southern Ontario by hand and air.

Ontario fox strain rabies

In the second half of the year an additional 4 cases of fox strain rabies were discovered in skunks, bringing the total number of cases for the year up to 10 (a total of 14 since Dec 2015). The skunk cases were discovered in Perth (1), Huron (1) and Waterloo (2) counties. In the fall re-baiting of those areas occurred, with over 190,000 baits distributed in Huron, Perth and Waterloo counties.

Raccoon strain rabies

In July, Ontario conducted baiting in the Burlington/Brampton area to distribute baits that included tetracycline. The flights also allowed for the testing of a new flight line planning software (FLAP). Approximately 50,000 baits were delivered at densities of 75 baits/km².



In August aerial baiting began in the Golden Horseshoe area to address the raccoon strain rabies outbreak. Approximately 600,000 baits were distributed in the area at 75 baits /km².

Hand baiting took place throughout the summer in the Golden Horseshoe area from July – October, and 260,498 baits were distributed at 150 baits/km² covering an area of 1,782 km²(Figure 2).

Monitored bait stations were also used for ground baiting throughout the Oakville area. Seventy-two stations were set up allowing raccoons to retrieve baits on their own. Stations were set up from July – August and over 10,000 baits were distributed using this method. (Details of this

Figure 2. 2017 Southern Ontario ORV baiting summer and fall.

project on page 11)

Baiting along the borders

In order to prevent a re-incursion of raccoon strain rabies from New York State, ONRAB® baits were distributed near the border along the St. Lawrence and Niagara rivers. In August approximately 20,000 baits were distributed on the mainland bordering the St. Lawrence River near Kingston and on Wolfe Island. Hand baiting crews followed up in September and distributed ~7,000 baits in the city of Cornwall (Figure 3), and MNRF partnered with the Mohawks of Akwesasne First Nation to provide 1,6000 baits for distribution on Cornwall Island. This area has not seen a case of terrestrial rabies since 2005.

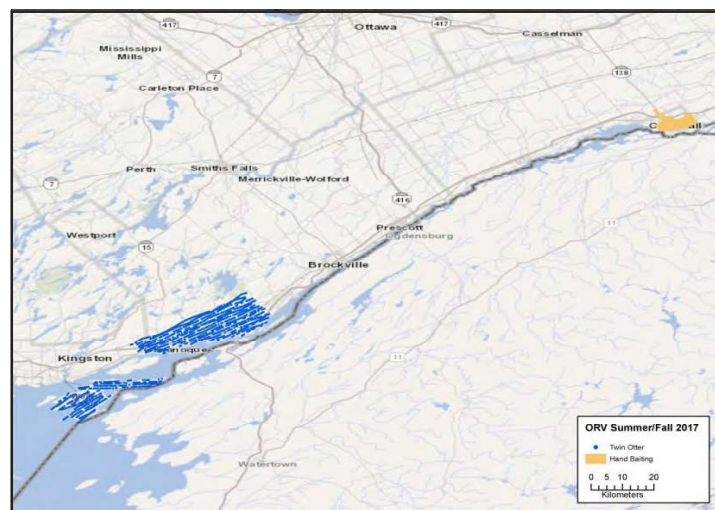


Figure 3. ORV summer and fall baiting in Eastern Ontario 2017.

Urban areas baited in the Niagara Peninsula between Ontario and New York were baited at a density of 150 baits/km² and rural areas were baited at a density of 75 baits/km² in the fall.

New Brunswick Update (to December 31, 2017)

M.R. Allan and J.P. Goltz, Department of Agriculture, Aquaculture and Fisheries

New Brunswick has detected 31 terrestrial wild animals (26 raccoons and 5 striped skunks) with raccoon rabies variant between May 2014 (when the current incursion began) and December 31, 2017 (Figure 4). In February 2017, three cases of rabies were detected in striped skunks from a single abandoned barn in the village of Waweig. In July, a dead rabid raccoon was found in the village of Milltown, likely spillover from across the border in Calais, Maine. All rabies cases have occurred within the geographic zone in which vaccine baits have been distributed annually between 2015 and 2017. No cases have been detected in domestic animals in New Brunswick.

In 2017, New Brunswick continued its oral rabies vaccination (ORV) control zone along the western border of the province (Figure 2) in response to cases detected in wildlife in the province and in nearby Maine. From July 10 through August 18, 2017, the Departments of Agriculture, Aquaculture and Fisheries, and Energy and Resource Development, and the Ontario Ministry of Natural Resources and Forestry (OMNRF) worked cooperatively to distribute approximately 539,000 ONRAB® oral rabies vaccine baits by plane (477,000) and by hand (62,000) over 5,700 km² in parts of Carleton, York and Charlotte Counties. Vaccine baits were also distributed in the cities of Fredericton (18,325 baits) and Saint John (18,150 baits) at a density of 150 baits/km² as a proactive measure to prevent rabies from becoming established in these cities. Although no cases of raccoon variant rabies have been detected in either city, their close proximity to the current outbreak area and higher anticipated vector population densities in urban areas increases the potential for human and domestic animal health risks if rabies were to spread into these areas.

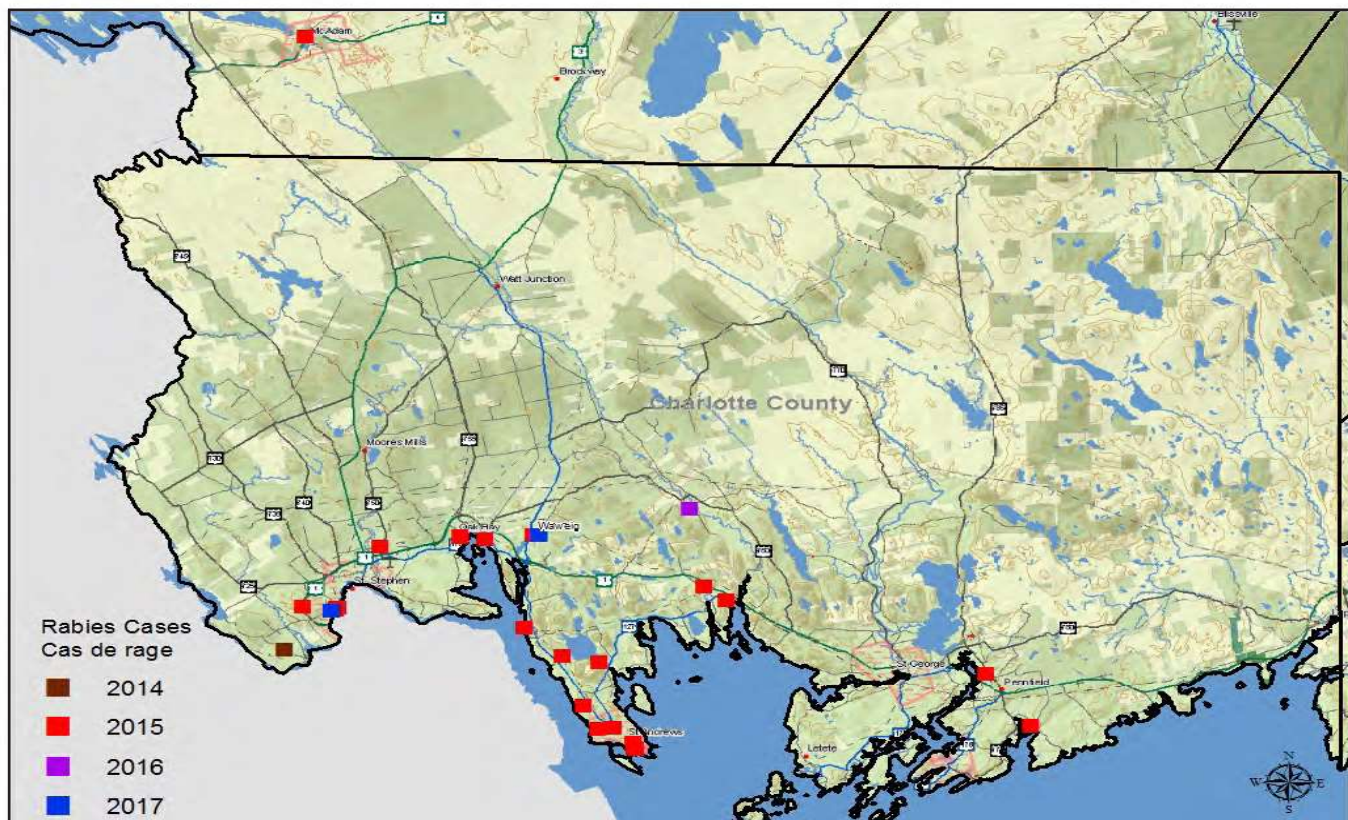


Figure 4. Raccoon variant rabies cases in New Brunswick 2014-2017.

The New Brunswick Department of Agriculture, Aquaculture and Fisheries collaborated with the Department of Energy and Resource Development, and the University of New Brunswick to successfully complete a raccoon population density study in parts of NB. Three habitat types were sampled including urban, agricultural lands and forest. Raccoon densities were highest in urban areas followed by agricultural lands and forest. Data analyses are continuing throughout the winter with plans to publish results in the near future. Results from this study will be used to aid in decision making around oral rabies vaccine (ORV) distribution densities in the future.

Funding has been secured and plans have been prepared to further heighten surveillance and continue the distribution of oral rabies vaccine baits in the western part of the province in 2018. In 2017, a record high of six cases of rabies were detected in Big Brown Bats in NB. All of these rabid bats were infected with one of the Big Brown Bat variants of the virus. Two persons were bitten by infected bats and required post exposure prophylaxis treatment, and a dog required post exposure prophylaxis and quarantine after coming in contact with a rabid bat. In recent years, numbers of Big Brown Bats appear to be expanding in New Brunswick, and this species tends to overwinter in homes and public buildings, especially in attics. Now that several bat species are considered to be “at risk”, the management of situations involving bats appearing in homes requires extra scrutiny and risk assessment to balance public health concerns with conservation concerns.

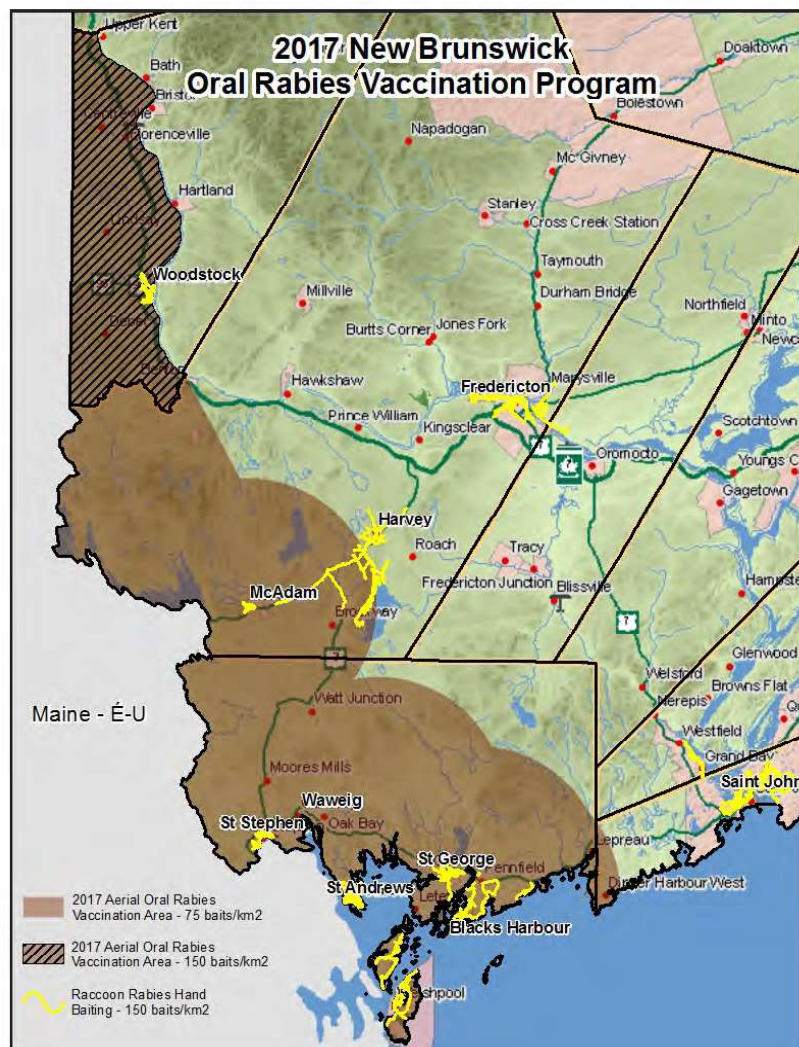


Figure 5. 2017 oral rabies vaccination zone in Southwestern New Brunswick.

An overview of 2017 raccoon rabies surveillance and control in Québec

Marianne Gagnier, Coordonnatrice provinciale, Ministère des Forêts, de la Faune et des Parcs

Québec Raccoon Rabies Control Program has once again proved to be efficient with no positive case detected in the province in 2017. This year was the twelfth consecutive year during which raccoon rabies control and surveillance actions were implemented. A late summer vaccination campaign, conducted along the QC-US border, coupled with enhanced surveillance and communications to encourage public awareness, were once again the basis of Quebec’s program.

The enhanced surveillance was carried out as planned. Through the year, a total of 1191 specimens were collected under raccoon rabies enhanced surveillance activities in southern Québec, mainly in Estrie and Montérégie regions (Figure 6). This represent an increase of 65% comparing with 2016 (n=721). Of these, 81% (n=963) were raccoons, 16% (n=177) were skunks and 3% (n=30) were foxes. Most of these animals were collected through road surveys (64%) or following a citizen reporting a suspicious or strange acting animal (32%). For the second year in a row, the number of reports showed an increase (29%), which could be related to the high raccoon density observed on the field (surveillance and post-ORV study) as well as the highest number of distemper cases confirmed or suspected in southern Quebec this year.

An oral rabies vaccination (ORV) campaign was conducted along the Québec-US border, in targeted areas where raccoon rabies reintroduction is still a threat. This campaign included aerial (August) and ground (August and September) baits distribution. Overall, 540 675 ONRAB® baits were distributed over an area of 5 342 km² (Figure 7).

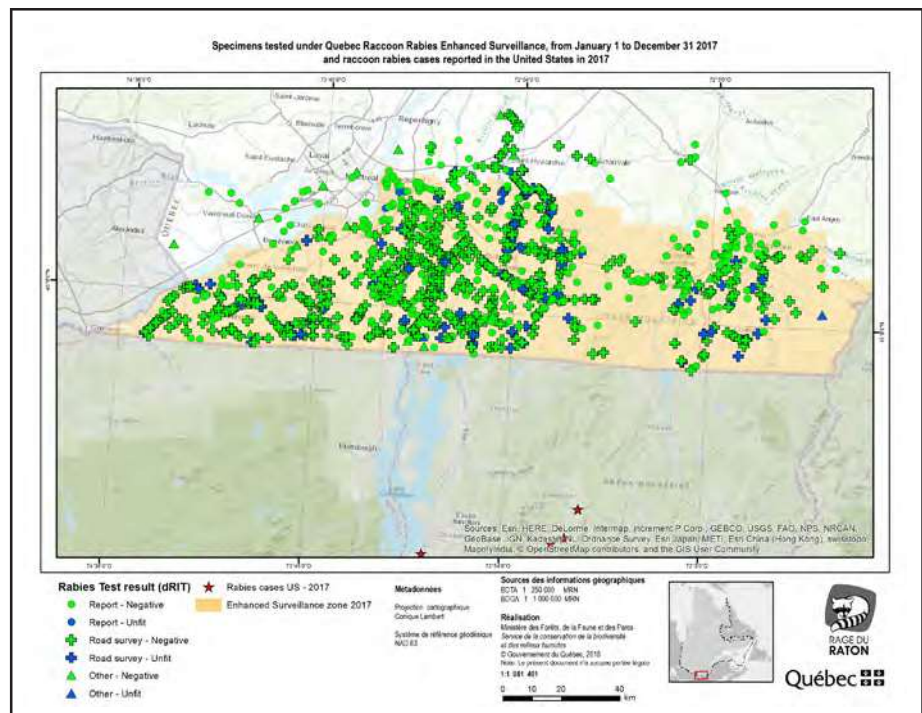


Figure 6. 2017 enhanced surveillance in Québec.

During the ORV campaign, the bait density used for ground baiting was 70 baits/km² and varied from 75-125 baits/km² for aerial baiting (by plane). As usual, the baits were distributed in preferred raccoon habitats, as forest patches and adjacent edges of field crops. A team of 15 professional trappers and wildlife technicians conducted at the ground distribution of about 259 050 ONRAB® baits over an area of 3 680 km². Ground baiting was also done in 9 city parks on Montreal Island, at a density of 200 baits/km². This year again, the weather conditions were ideal throughout the whole ORV campaign.

As an evaluation of the success of the vaccination, a post ORV study was conducted from October 10th to the 20th, about 6 to 8 weeks after the completion the ONRAB® baits distribution. The goal of this study was to assess the percentage of raccoons positive for rabies virus antibodies in 2017. Five cells of 100 km² each were sampled, with a total of 676 raccoons blood serums collected. The trapping success was one of the highest recorded since 2007, with 25 raccoons per night-trap. The results of antibody prevalence ranged between 43-51% (c-ELISA, CFIA), with an average of 47%. Those results were higher and obviously more satisfying than the results obtained in 2016 (34%).

For the Québec government, this Program will remain essential until raccoon rabies epidemic front is pushed further south, decreasing significantly the threat of reintroduction. To achieve this goal, the Québec government is still actively collaborating with the neighbouring jurisdictions (Ontario, New Brunswick and United States). Moreover, the Québec rabies scientific Committee, advising the authorities regarding the Program, is very confident with the evolution of the raccoon rabies situation in the States near the province. The number of positive cases in the United States, near Québec, has decreased again in 2018, and their distance from the border is increasing, likely an outcome of the use of ONRAB® baits in the bordering states since 2012. In reaction to the observed regression of the rabies front, the Committee as recommended the reduction of the area targeted for the 2018 ORV campaign in Québec.

For further information on the Québec rabies surveillance and control program, please contact Marianne Gagnier at marianne.gagnier@mffp.gouv.qc.ca / 418-627-8694 ext.7422.

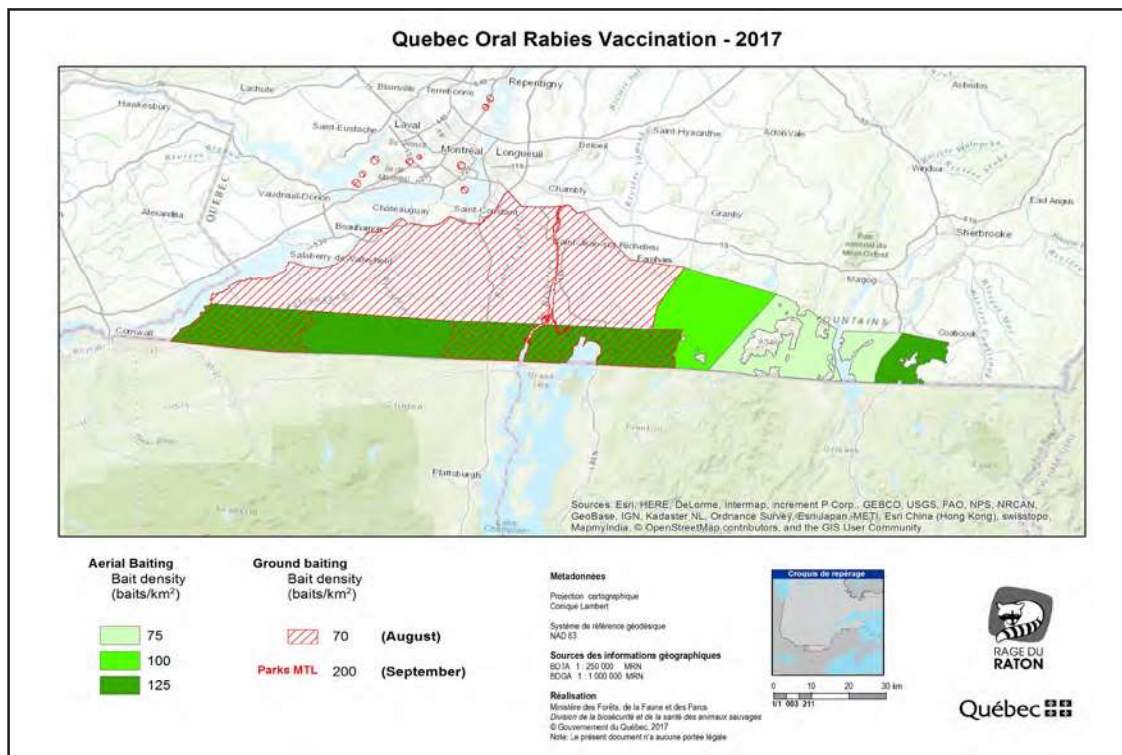


Figure 7. 2017 ORV in Québec.

Rabies is Real – An Innovative Approach to Rabies Awareness

Jane Murrell, Public Health Inspector - City of Hamilton

In December 2015, The City of Hamilton had its first positive terrestrial animal with raccoon rabies. This was the first case of rabies in a terrestrial animal in over twenty years and the first time that the raccoon variant virus was ever found in southwestern Ontario. This was not an isolated case but the start of Canada's largest raccoon strain rabies outbreak. Awareness and education became a top priority to ensure no human deaths occurred during this outbreak especially since rabies was not a hot topic at the time.

The average human is bombarded with information and advertisements on a daily bases. In fact over 5000 per day, this is also combined with a drop in attention span over the last 18 years, to that of only 8 seconds which happens to be less than a goldfish. Hamilton Public Health wanted to create a new rabies campaign that would grab the attention of the public, create awareness and prevent exposures before they happen.

We worked with an external company to develop some options for our new campaign. We were presented two very different finished pieces. One was the more typical health education piece with simply a picture of a raccoon. The other however was one that was new and innovative and definitely grabbed the public's attention. After several rounds of focus group testing there was overwhelming support for the "baccoon" and "skox" (Figure 8).

This new campaign not only brought together the four main vector species in a creative way to grab attention but it also focused on some simple key messaging.

This new campaign was used throughout the community on transit shelters, billboards, ice rink boards in all city arena's and was even used to wrap a city Animal Services vehicle which will be on the road daily for years to come.

Hamilton Public Health Services also improved outreach by targeting high risk groups like Animal Services, children, community cat caregivers, farmers and wildlife rescuers, just to name a few. New messages were communicated that had not been in the past which included "Supervise your pets at all times" and "Reporting all sick or strange behaving wildlife to our local Animal Services".



Figure 8. The "skox", part skunk, part fox, is one of the species developed for the city of hamilton's rabies communications campaign.

To further support our campaign and enhance the effectiveness, many additional resources were created. These included:

- Magnets with important numbers to call
- A translocation resource to reduce the transportation of wildlife
- Rabies educational videos - short public service announcement, longer animated video and how to administer Post Exposure Prophylaxis for health care professionals
- Door Knockers for residents who reported a sick, dead or strange behaving animal

The new campaign and its supporting resources were very successful in creating rabies awareness and reducing risk. These resources were also shared with other agencies like; all Ontario Health Units, Province of New Brunswick, Province of Nova Scotia, Province of Québec, Ministry of Transportation and the Centre for Disease Control. Hamilton continues to work with various local, provincial and international agencies to reduce the risk of human cases, wildlife surveillance and promote rabies education for the public.

Links to videos:

Short PSA <https://www.youtube.com/watch?v=pl0pNlCk03o>

Animated video: <https://www.youtube.com/watch?v=TufdLAQFLRo>



Figure 9. The Baccoon is another of the species created for the rabies campaign in the City of Hamilton.

Rabies in the Americas conference 2017

Rachel Gagnon, Ontario Ministry of Natural Resources and Forestry

The Rabies in the Americas (RITA) annual conference took place in Calgary Alberta from October 22-27, 2017. The first RITA conference was held in 1990 and it is the longest running annual international rabies conference in the world. The conference is held at a new location every year. 2018's conference will in Buenos Aires, Argentina October 28 – November 2.

For 28 years the conference has provided researchers, health professionals, wildlife biologists, laboratory personnel, rabies managers and others from all over the world an opportunity to discuss rabies challenges and successes. This year approximately 200 people representing 24 countries including Canada, US, Mexico, Columbia, Brazil, Haiti etc, were in attendance. The event was hosted by University of Calgary Veterinary Medicine, with support from the Canadian Food Inspection Agency, Public Health Agency of Canada, Government of Alberta, and Government of Ontario.



Figure 9. Kevin Middel delivers a presentation on Ontario's Rabies Control Program.

Ontario is an important player in the world of rabies control and had representatives from various agencies and organizations attend including 2 staff from MNRF, 1 from Ministry of Health and Long-Term Care, 1 from the Ontario Ministry of Agriculture Food and Rural Affairs, and representatives from Hamilton Public Health.

Throughout the 5 day conference, participants were able to listen to numerous presentations and research posters related to different rabies themes. Themes included; human rabies and prophylaxis; vaccines and antivirals; management of skunk rabies in North America; wildlife rabies; rabies ecology in the warming arctic; and more. Additional meetings were also held, including the North American Rabies Management Plan meeting and Partners for Rabies Prevention.

MNRF's staff provided 3 presentations: "*Raccoon Rabies Re-incursion; an urban context*" about the complexities, control techniques and research gaps of urban rabies control, "*Skunk ONRAB field trials in Canada*", and "*Ontario dRIT surveillance program*" about recent dRIT surveillance publication and how Ontario implements intense enhanced surveillance into the control program. As well MNRF staff sat as a panel member on the skunk rabies control round table session and moderated the rabies control presentation session. MNRF also had a representative on the RITA planning committee. The conference provided an opportunity for colleagues who would normally not see each other a chance to meet face to face. Ontario representatives were able to meet with colleagues from University of Montreal, Québec CWHC, and Province of Québec, as well as the USDA to discuss collaborative research opportunities.

RITA has gained popularity over its almost 30 years. The value it provides to participants through learning, networking and engagement opportunities is significant. MNRF representatives were happy to have been a part of it, and hope to be able to return again in the future.

Rabies bait monitoring stations

Buddy Dupuis, Graduate student, Trent University

The return of raccoon rabies to Ontario in December 2015 led to the expansion of rabies management efforts throughout the 'Golden Horseshoe' area of southern Ontario. The persistence of the virus in wildlife populations within this area has created an opportunity to test novel methods of vaccine bait release to improve vaccination rates in raccoons. In 2016, the Ontario Ministry of Natural Resources – Wildlife Research and Management Section (WRMS) conducted a pilot study, working with Trent University student Buddy Dupuis as part of his post-graduate master's research project, on vaccine bait feeding stations using a modified version of a bait station developed by the United States Department of Agriculture. Feeding stations are a novel approach for vaccine delivery, compared to more traditional hand and aerial baiting methods. In the pilot study, stations were placed along linear features thought to be used by raccoons: at culvert locations along two high-traffic multiple-lane highways, and along a high-cliff escarpment corridor, all within the city of Hamilton. Use of the stations was measured with motion-activated infrared cameras to observe and quantify both the species using the stations and the subsequent bait consumption by raccoons. Pilot study results demonstrated considerable bait consumption by raccoons, leading to further interest in the use of feeding stations as a means of vaccine distribution on the rabies-affected landscape.

One prominent goal in the effort to eliminate raccoon rabies in Ontario is establishing and maintaining high-vaccination rates for raccoon populations in urban areas. The distribution of ONRAB[®] baits in these areas is



Figure 10. A raccoon visits one of the rabies vaccine baits stations and leaves with a bait in its mouth.

affected by the high density of human populations. In urban areas baits have usually been distributed by hand from the ground, rather than by aerial baiting. This poses a challenge when trying to access locations that raccoons are most likely to find and eat the baits. The outcomes of this challenge are reflected in the results of the post- ORV serology, where most rural treatments (baited from the air) have higher vaccination rates than urban treatments. With the preliminary success of the feeding station pilot study (including a literature review of station use successes in the USA), the next step in researching bait station effectiveness was to test their use on a landscape level, within a large urban area, in the active rabies management zone.

At a landscape level it is important to determine whether the placement location of stations within different areas of raccoon habitat will affect vaccination rates. The use of landscapes by wildlife species is affected by the landscapes connectivity – the tendency for landscape features to impede or facilitate animal movement. For example, busy roads can often be barriers to wildlife species. In 2015, MNRF's Wildlife Research and Monitoring Section developed a multi-species wildlife landscape connectivity model described in the publication 'Landscape Connectivity in the Great Lakes Basin'. The software process uses circuit theory to model omni-directional, multi-species habitat connectivity on any given landscape. The methodology from the publication was modified to model movement probabilities within the study area; encompassing the majority of west-central Oakville, Ontario. From the model output areas of high and low connectivity were selected to test for the effect of landscape connectivity on vaccination rates at bait stations. Stations were installed, refilled and monitored in both treatments during July and August of 2017 and a component of the MNRF live-trapping rabies serology program (conducted in October of the same year) was committed to collect samples from wildlife within the bait station zones.

To compare between the two treatment areas data were collected by measuring consumption rates during station installation, bait refills, and removals, by using motion-activated infrared cameras as active monitoring equipment at each station and by blood and tooth extraction during the fall serology program. Blood samples were analyzed to determine if successful vaccination had occurred on live-trapped raccoons by testing for the presence of rabies antibodies, and tooth extraction was conducted to analyze for the presence of a biomarker, tetracycline added to vaccine baits. This would confirm if the animal consumed a tetracycline-laden ONRAB[®] bait used only in the study area. High habitat connectivity treatment areas were expected to have higher vaccination rates, higher prevalence of tetracycline, more baits consumed and a suite of results from camera observations that indicate more station and bait interaction at high connectivity station locations.

The results that have been collected to-date suggest that feeding stations had higher vaccination rates than other types of bait release methodologies used in urban areas, including hand-baiting methods. However, preliminary analysis suggests there was not a strong difference between high and low connectivity treatments for vaccination rates, or tetracycline marking. To strengthen the analysis, a second field season for 2018 is currently being coordinated. Data analyses are ongoing, and all results are expected to be released in 2019.

Rabies reporter continues its almost 30 year journey

Rachel Gagnon, Ontario Ministry of Natural Resources and Forestry



Then ...

.... and now!

MNRF has been working with partners for decades to communicate rabies information. In 1990, the ministry decided to send out its first ever Rabies Reporter. A descendent of the annual rabies summary, this publication promised to provide readers with updated maps and summary tables and inform them about the rabies program in Ontario. Recent issues have highlighted results of the rabies control programs, communication and vaccine campaigns, the status of rabies cases in the province, and updates on the rabies control program.

Nearly 30 years since the first issue, the Rabies Reporter continues to be distributed across Ontario and beyond. It is sent out quarterly and includes maps and tables of rabies cases in the province, along with updates on survey and control programs in Quebec, New Brunswick, and neighbouring U.S. states. Over the years, it has included articles about baiting and trapping, bait development, research results, staff comings and goings, operational techniques, communications campaigns, and more. The reporter is sent out to over 500 subscribers and is broadly re-distributed by organizations to through own networks reaching a variety of audiences.

For more about rabies and Ontario's control program, visit ontario.ca/rabies

If you would like to be added to the Rabies Reporter distribution list contact Rachel Gagnon at rachel.gagnon@ontario.ca

Congratulations and good luck to Beverly Stevenson!

The rabies program would like to congratulate Beverly Stevenson on her new job and say thank you for her significant contributions to the rabies program.

Bev worked in the rabies program for more than 20 years and provided crucial support to program delivery as well as communications services. She worked as both a wildlife research technician and a science transfer specialist through her career with the Ontario Rabies Program. Bev helped coordinate the flights and baiting campaign as well as helped with trapping and research. She was also integral in the helping with the Rabies Advisory Committee to organize and deliver these international meetings semi-annually. She also conducted numerous interviews and presentations to educate the public about the rabies program, its history and importance.

Bev is a hard worker and made friends with staff and partners through her time with the rabies program. She will be sure to bring her hard working and creative qualities to her new position as science transfer specialist with the Strategic Planning and Business Management Section within the MNRF.

We wish her well in her new endeavors. Congratulations!



Animal Rabies Report: July to December 2017

County or Region	Animal Type	Fox		Raccoon		Skunk		Other Wildlife		Bat		Dog		Cat		Livestock		Totals			
		Cumulative		Cumulative		Cumulative		Cumulative		Cumulative		Cumulative		Cumulative		Cumulative		Cumulative			
		17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16		
Southern																					
Hamilton		1	21	45	126	5	19	76		1	1	2			1	1		27	66	206	
Haldimand-Norfolk		1	1	6	17	1	2											2	8	18	
Brant			3	8	11		1											3	8	12	
Niagara			7	19	10		2			1	5							7	22	17	
Elgin										1	3							1	1	3	
Oxford											2							0	0	2	
Middlesex										1	2							0	1	2	
Lambton											1							0	0	1	
Kent										1	1	1						1	1	1	
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	2	3	0	0	0	0	0	0	2	2	3	
Central		0	0	0	0	0	0	0	0	4	5	6	0	0	0	0	0	4	5	6	
Western		0	1	0	4	8	7	14	4	0	8	4	0	0	0	0	4	1	20	35	16
Southern		0	0	2	32	78	164	6	23	80	0	0	3	5	16	0	0	41	107	263	
Northern		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals		0	1	2	36	86	171	14	37	84	0	0	17	20	29	0	0	67	149	288	

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

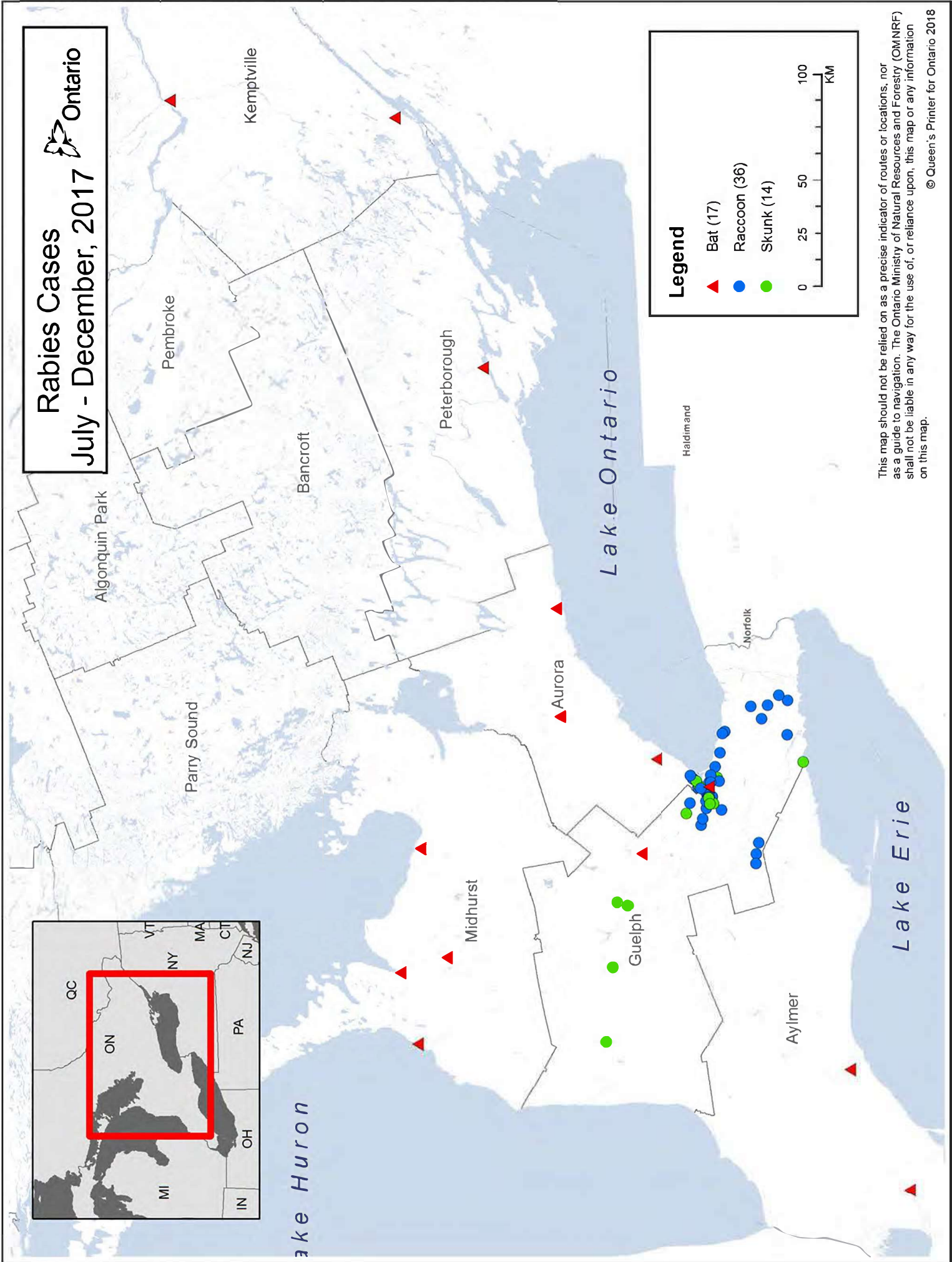
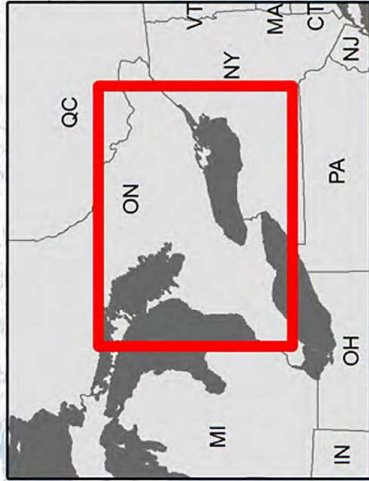
Column Legend

- # : Cases from July 2017 – Dec 2017
- 17: Cases from Jan 2017 – Dec 2017
- 16: Cases from Jan 2016 – Dec 2016

Rabies Cases July - December, 2017

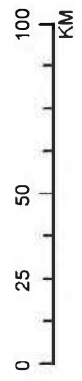


Ontario



Legend

- ▲ Bat (17)
- Raccoon (36)
- Skunk (14)



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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