

The Rabies Reporter

The Ministry of Natural Resources and Forestry
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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 not be cited in papers intended for refereed journals. Send contributions, letters and inquiries to: rabies@ontario.ca.

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Ontario.ca/rabies

Rabies cases continue trending down during the second half of 2018

Rachel Gagnon, Ministry of Natural Resources and Forestry

As 2018 came to an end, rabies cases continued to show a decline from previous years. A total of 104 rabies cases were detected throughout the year (Figure 1), compared to 149 total cases for 2017. Of the 104 cases detected in 2018, 64 cases were detected between July and December.

Raccoon strain: 38 cases of Atlantic raccoon strain cases were detected between July and December of this year. These cases included 29 raccoons and 9 skunks within approximately 65 km of the original Hamilton case found in 2015. The cases were found in Hamilton (16 raccoon and 3 skunk), Niagara (7 raccoon and 5 skunk), Brant (4 raccoon), Haldimand (2 raccoon), and Waterloo (1 skunk). The case detected in North Dumfries (within the Regional Municipality of Waterloo) expanded the raccoon strain surveillance and baiting zone 13.5 km to the northwest. This expansion overlapped the fox strain surveillance area; bait densities were increased to better target raccoon strain vector species.

Fox strain: A total of seven fox strain cases were detected in 2018. Three cases were detected during the second half of the year in 2 skunks and 1 bovine. The cases were detected in Wellington (2 skunks) and Perth (bovine) counties. During the same time last year, there were 4 cases of fox strain rabies found in Waterloo, Perth and Huron counties with a total of 10 cases for the entire year.

Bat strain: A total of 31 bats tested positive for rabies in 2018, with 22 of those bats detected during the second half of the year. The bats species included 18 big brown bats, 2 hoary bats, 1 silver-haired bat, and 1 little brown bat and were found in a variety of counties throughout the province including: Algoma, Brant, Chatham-Kent, Durham, Grey, Halton, Haliburton, Middlesex, Niagara, Ottawa, Peel, Peterborough, Wellington-Dufferin-Guelph. In addition to the bats, 1 skunk tested positive for a bat strain of rabies in the Cornwall area.

Since the outbreak began in December 2015 a total of 449 raccoon strain, and 21 fox strain cases have been detected in Ontario (Figure 2). MNRF will continue enhanced surveillance and rabies control throughout 2019.

Rabies Cases 2018

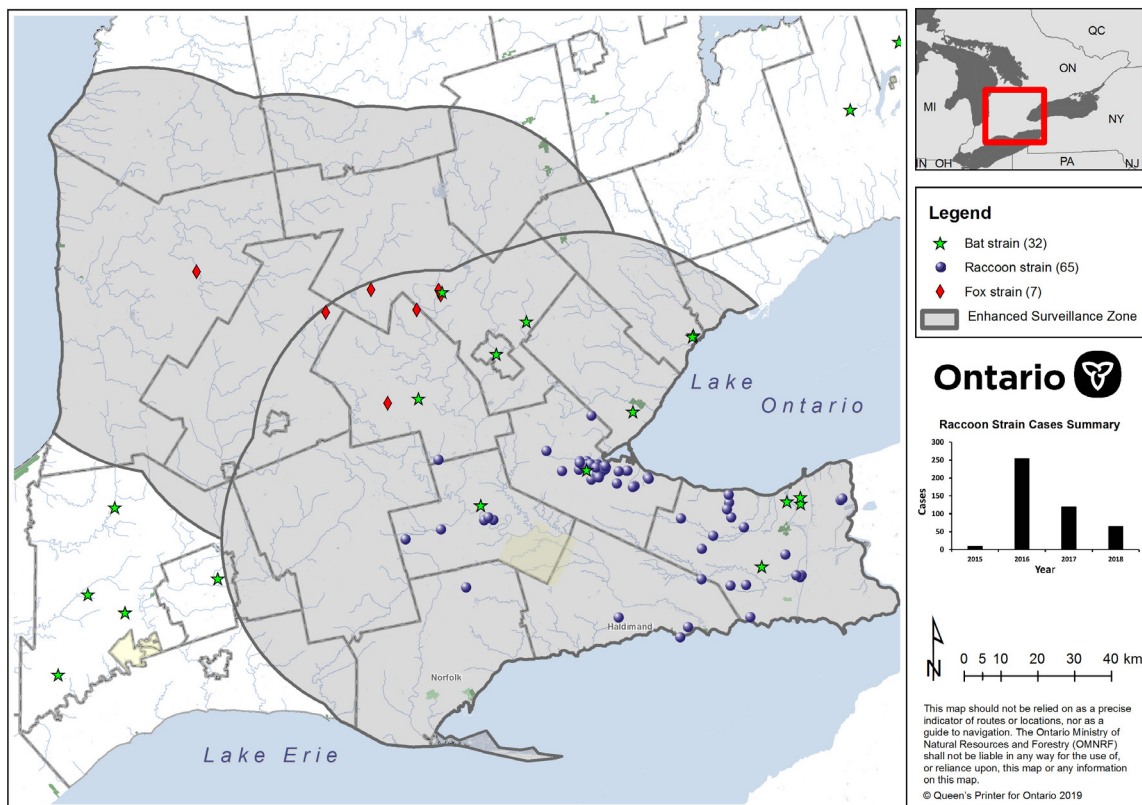


Figure 1. Rabies cases (N=104) detected in southern Ontario from January–December 2018.

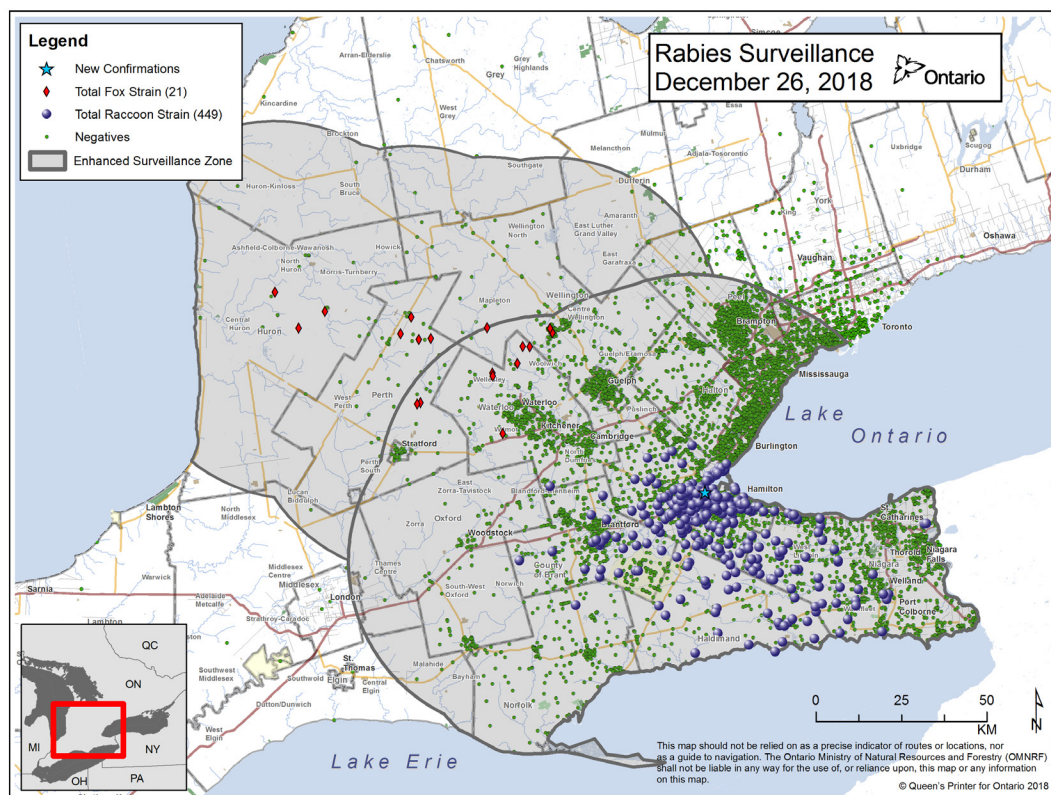


Figure 2. Total rabies cases in southern Ontario from December 2015–December 2018 along with the surveillance and control zone.

Rabies Control in 2018

MNRF

As MNRF continues its efforts to control rabies in southern Ontario, the number of cases detected continues to trend downward for the second year in a row. This year, there was a total of 104 rabies cases detected in the province — 72 were terrestrial rabies cases (65 raccoon strain, and 7 fox strain) which were all detected within the enhanced surveillance zone. Both the raccoon and fox strain surveillance zones had slight expansions this year, requiring spot treatments and additional baits to be distributed. MNRF and partners continued to focus on oral rabies vaccine ONRAB® bait distribution and enhanced surveillance within 50 km of any positive cases. Enhanced surveillance focused on the collection of sick, strange acting, or found-dead wildlife for rabies testing.

Ontario's wildlife rabies control program is primarily based on the distribution of ONRAB® baits. In 2018, 1.4 million baits were distributed in southern Ontario by hand and air.

Aerial baiting

Annual aerial baiting typically occurs from August–October via helicopter (urban forested areas) and airplane (rural areas), covering the entire surveillance and control area (Figure 3). This year helicopter flights were conducted from August 13–19, and distributed 24,975 baits covering an area of 263 km² at a density of 75 baits/km². An additional 65,375 baits containing the biomarker tetracycline were distributed in rural areas north of Burlington and Oakville as part of a bait acceptance research experiment. Two different bait densities of 75 and 150 baits/km² were applied to the area covering 637 km².

From August 23–September 7, an additional 600,672 baits were distributed at 75 baits/km² by plane, followed by another 64,800 baits via helicopter at 150 baits/km² between September 10–14 in the Golden Horseshoe area.

From September 17–20, baiting of the entire fox strain outbreak area occurred. This area includes parts of Bruce, Grey, Huron, Perth, Middlesex, Simcoe, Waterloo, and Wellington, counties. Just over 171,000 baits were distributed by airplane.

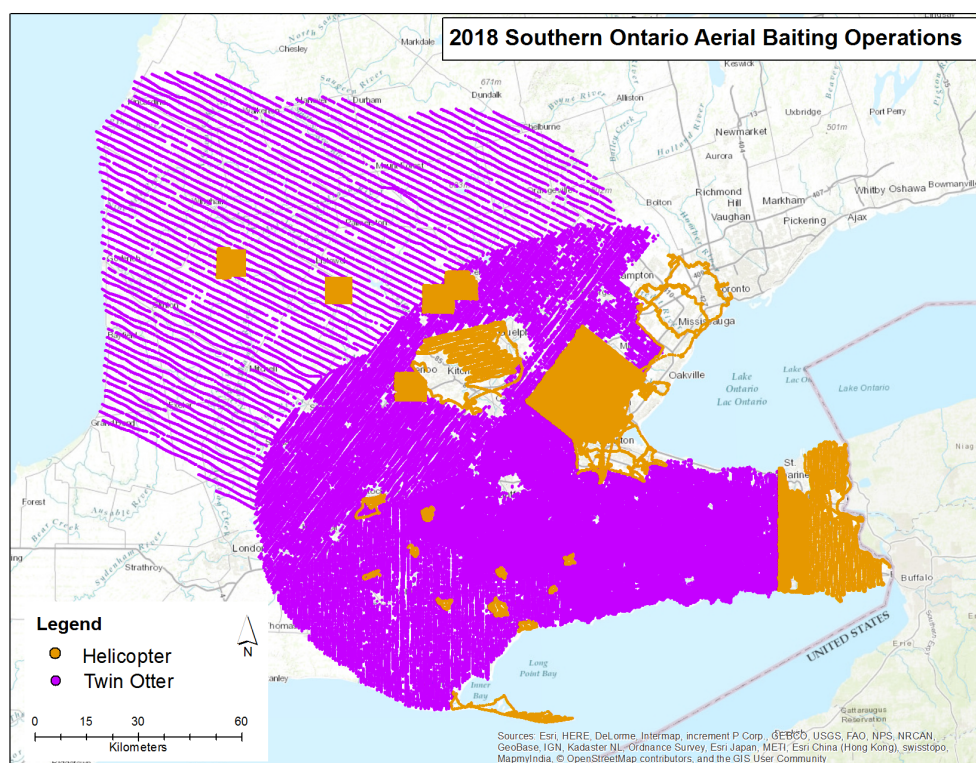


Figure 3. Southern Ontario aerial baiting was conducted from August to October; approximately 1.4 million baits were distributed.

In addition to the 5 spot treatments conducted earlier in first half of the year, MNRF conducted 4 more spot treatments in the second half of the year in response to animals nearing the edge of the surveillance area. A spot treatment was conducted in the Burford area on August 19 in response to a positive raccoon, 1,050 baits were distributed. Three additional spot treatments were conducted in December in Niagara on the Lake, Ayr, and Mapleton. On December 10, a flight in the Niagara area took place and 19,725 baits were distributed in response to 2 new positive cases near the Ontario/US border. An additional 18,762 baits were distributed in North Dumfries Township surrounding Ayr in response to a new raccoon strain case that was detected in a skunk there, and 19,124 baits were distributed near mapleton in response to a fox strain case in the area.

Hand distribution

Hand baiting targets urban skunk and raccoon habitat where use of aircraft would not be feasible (Figure 4).

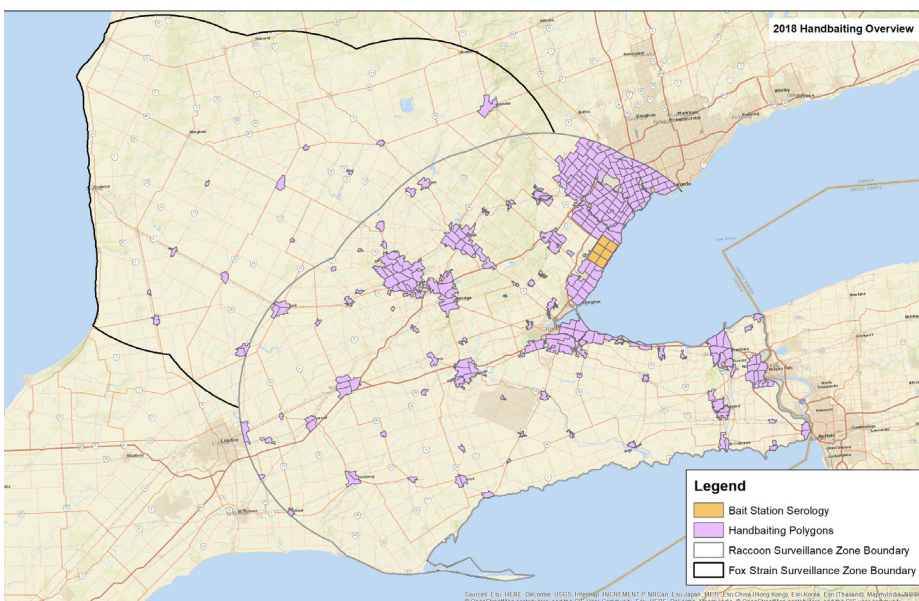


Figure 4. Hand baiting is used in urban areas to target raccoon and skunk habitat.

It also provides opportunity for staff to interact directly with landowners. Crews can inform landowners about the rabies program and that rabies may be present in the area. Staff focus on raccoon and skunk habitat (bushes, parks, ravines, etc.) where animals may be foraging, or along fence lines and large culverts used by travelling animals. Green spaces such as forested parks, along railways and small hydro corridors are also targeted by crews and are covered on foot using existing trails and pathways.

Hand baiting took place throughout the summer in the Golden Horseshoe area from July 3–September 27. Over 301,000 baits were distributed at 150 baits/km² covering an area of 1,924 km².

Monitored bait stations are also used for hand baiting throughout the Golden Horseshoe area in wildlife corridors. Seventy-two stations were set up allowing raccoons to retrieve baits on their own. Stations were set up from July 3–September 27 and over 38,209 baits were distributed using this method.

Eastern Ontario proactive baiting

In order to prevent another re-incursion of raccoon strain rabies from New York State, ONRAB® baits were distributed in an area along the St Lawrence River. On September 22, 23,100 baits were distributed by fixed-wing aircraft over a 431 km² area on the mainland bordering the St. Lawrence River near Kingston and

on Wolfe Island. All baits were dropped along flight lines spaced 0.75 km apart and distributed at a density of 75 baits/km² over agricultural and forested habitats. From August 27–30, hand baiting crews distributed 5,728 baits in the city of Cornwall (Figure 5), on Wolfe Island, and on the adjacent mainland east of Kingston.

Additionally, MNRF partnered with the Mohawks of Akwesasne First Nation to provide 1,600 baits for distribution on Cornwall Island (Akwesasne). Eastern Ontario has not had a confirmed case of terrestrial rabies since 2005.

Trap Vaccinate Release

Ontario's Trap-Vaccinate-Release (TVR) program was completed between July 9 and September 21, in Burlington, Dundas, and Hamilton. Twelve cells covering approximately 69 km² were trapped. TVR cells were selected to create a wall of vaccinated animals to prevent the spread of rabies into the Greater Toronto Area and other rabies free zones. Four of these cells were revisited in September for serology to test the effectiveness of the vaccination process.

With cooperation from the public, cities, and various organizations, permission was obtained to set live traps on private and public land. Animals were captured in live traps and vaccinated with a direct intramuscular injection of IMRAB®3 rabies vaccine. Ear-tags were applied with unique identification numbers so mark recapture data could be used to estimate the percentage of animals vaccinated. After vaccination, the animals were released at the site of capture (Figure 6). Close to 1,300 different raccoons and skunks were vaccinated during this program in 2018.

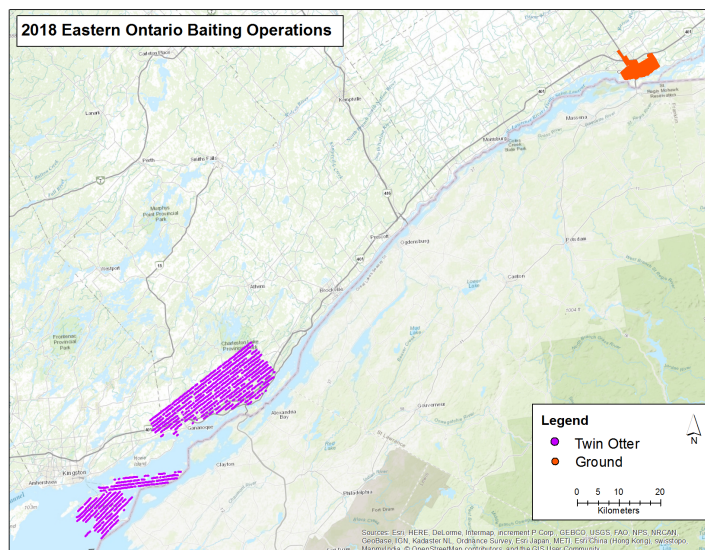


Figure 5. Eastern Ontario baiting occurs to prevent re-entry of the rabies virus.



Figure 6. A raccoon is released after being vaccinated against rabies.

Canine distemper and rabies co-infection in raccoons

Claire Jardine, University of Guelph

Recent research shows that it's common for raccoons and skunks to be infected with both rabies and canine distemper virus (CDV) at the same time, especially in raccoons.

Researchers from University of Guelph, the Canadian Wildlife Health Cooperative, and the MNRF worked together to better understand the likelihood that raccoons and skunks could have both rabies and CDV at the same time. The researchers conducted additional testing on diagnosed rabid raccoons and skunks and found that 69% of raccoons and 21% of skunks were also positive for CDV. These results show that both viruses should be considered when testing wildlife in areas known to have canine distemper present and that are also at risk of rabies.

Both viruses are serious, causing death among wild carnivores in North America. Scientists knew an animal could have both viruses at the same time, but they didn't know how common this was. The two viruses share similar signs in animals so if an animal tests positive for CDV, rabies testing is often not done, especially in areas where rabies is not thought to be present.

Recommendations for future study include looking into if rabies can occur at all stages of the distemper infection and assessing how these viruses may affect each other's progression.

Since rabies and CDV differ in their effects on human and animal health, it's important to have an accurate picture of how they are distributed in the province. As well, because the potential impacts of missing a rabies case are serious, we need to be aware of how commonly these viruses can co-occur.

To read the full report please email Claire Jardine at cjardi01@uoguelph.ca or see: <https://bioone.org/journals/Journal-of-Wildlife-Diseases/volume-54/issue-3/2017-04-072/Frequency-of-Virus-Coinfection-in-Raccoons-iProcyon-lotor-i-and/10.7589/2017-04-072.short>

Rabies staff settle into their new roles during the 2018 rabies field season

Congratulations to Sarah Hagey, Natalie Pulham and Andrew Silver as they settle into their new roles during the 2018 rabies control program's field season.

Sarah Hagey has completed her first field season in her new role as a full-time wildlife research technician. Her role supports MNRF's Rabies Program through planning and delivery of aerial baiting program, the provincial rabies surveillance program, and through rabies presentations, meetings, and communications events. Sarah has worked with MNRF's Hudson Bay Lowlands research team on contracts and as a seasonal technician for the past 17 years assisting with goose banding, polar bear research, shorebird banding, and small mammal research projects. Additionally, Sarah has worked on rabies projects for the past 10 years and through 2017, led MNRF's rabies aerial baiting programs in Ontario, Quebec and New Brunswick.



Natalie Pulham completed her first year as the lab lead, seasonal wildlife research technician. In this role she supports MNRF's Rabies Response program by leading the rabies surveillance and dRIT testing program in the wildlife research and monitoring section's containment level 2 necropsy lab at Trent. Natalie has worked with the Ontario Government for the past 6 years in Wildlife Policy and Enforcement Branch and Ministry of Environment and Climate Change. For the past three years Natalie has been working in the rabies program and assorted WRMS research projects.

Andy Silver started his new role as senior wildlife research technician with the Wildlife Research and Monitoring Section in September. This role provides expertise and leadership for the rabies response and chronic wasting disease surveillance programs. Andy received his bachelor of science in Zoology from Guelph University and has worked for the MNRF since 1990, primarily with the Rabies Research and Development Unit and Wildlife Research and Monitoring Section, but also with Enforcement Branch and most recently as a senior technician with southern Biodiversity and Monitoring Section.



Ontario Animal Rabies Report

Detected rabies cases by region from January to December 2018 compared to same period in 2017

Animal type and year	Fox 2018	Fox 2017	RAC 2018	RAC 2017	SSK 2018	SSK 2017	Other 2018	Other 2017	Bat 2018	Bat 2017	Dog 2018	Dog 2017	Cat 2018	Cat 2017	LVSTK 2018	LVSTK 2017	Total 2018	Total 2017
County or Region																		
Eastern Ontario																		
Frontenac																	-	-
Lanark																	-	-
Leeds and Grenville										1							-	1
Lennox & Addington																	-	-
Prescott-Russell																	-	-
Ottawa-Carleton									3	1							3	1
Renfrew																	-	-
Stormont, Dundas, Glengarry					1 (bat strain)												1	-
Central Ontario																		
Durham									1	1							1	1
Haliburton									2								2	-
Hastings										2							-	2
Northumberland																	-	-
Peterborough									3								3	-
Prince Edward																	-	-
Simcoe										1							-	1
Toronto																	-	-
Victoria																	-	-
York Region										1							-	1
Western Ontario																		
Bruce										1							-	1
Grey									1	4							1	4
Halton				8		9			1	1							1	18
Huron					1	1										1	1	2
Peel									2								2	-
Perth						1									1	3	1	4
Waterloo		1			3	3			1	1							4	5
Wellington-Dufferin-Guelph					3				3	1							6	1

Year	Fox 2018	Fox 2017	RAC 2018	RAC 2017	SSK 2018	SSK 2017	Other 2018	Other 2017	Bat 2018	Bat 2017	Dog 2018	Dog 2017	Cat 2018	Cat 2017	LVSTK 2018	LVSTK 2017	Total 2018	Total 2017
Southern Ontario																		
Brant			6	8					1								7	8
Elgin										1							-	1
Essex																	-	-
Haldimand			3	6		2											3	8
Hamilton			30	45	7	19			1	1				1			38	66
Kent									1	1							1	1
Lambton																	-	-
Middlesex									5	1							5	1
Niagara			10	19	7	2			4	1							21	22
Norfolk			1														1	-
Oxford																	-	-
Northern Ontario																		
Algoma									2								2	-
Cochrane																	-	-
Kenora																	-	-
Muskoka																	-	-
Nipissing																	-	-
Parry Sound																	-	-
Rainy River																	-	-
Sudbury																	-	-
Thunder Bay																	-	-
Timiskaming																	-	-
Totals																	-	-
Regional Totals																		
Eastern		-	-	-	1	-	-	-	3	2	-	-	-	-	-	-	4	2
Central		-	-	-	-	-	-	-	6	5	-	-	-	-	-	-	6	5
Western		1	-	8	7	14	-	-	8	8	-	-	-	-	1	4	16	35
Southern		-	50	78	14	23	-	-	12	5	-	-	-	1	-	-	76	107
Northern		-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	2	0
Totals		1	50	86	22	37	0	0	31	20	0	0	0	1	1	4	104	149

Column Legend

2018: Cases from Jan 2018 – December 2018

2017: Cases from Jan 2017 – December 2017

RAC: Raccoon

SSK: striped skunk

Other: other wildlife

LVSTK: livestock

Rabies Cases January - December, 2018

