

# The Rabies Reporter

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**The Rabies Reporter**, a scientific newsletter about current issues in rabies research and control, is a joint effort of the Rabies Research Unit of the Ontario Ministry of Natural Resources; the Rabies Laboratory at the Animal Diseases Research Institute of the Canadian Food Inspection Agency; the Ontario Ministry of Health; and the Geographic Information Systems Laboratory at Queens University, Kingston. 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:

The Rabies Reporter  
Rabies Research &  
Development Unit  
OMNR,  
P.O. Box 4840  
Peterborough, ON K9J 8N8

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## NOT MUCH NEW SUMMARY OF RABIES IN ONTARIO 2001

Very little changed in 2001, compared to 2000. Raccoon rabies was contained in a smaller area, but cases were up slightly. In western Ontario, the last vestiges of arctic fox strain rabies continued, mostly in skunks, but with almost identical totals in the last two years.

In the western region, there were 4 rabid foxes, 47 rabid skunks, and 67 total non-bat cases in 2001. That compares to 7 foxes, 43 skunks and 61 total non-bat cases a year earlier. Numbers have stayed in a narrow range since 1996! In the central re-

gion the number of rabid skunks was 6 vs 13 in 2000, and there was only one in the last quarter; maybe that outbreak is dying down. In northern Ontario, there were 35 total cases in 2001, compared to 38 in 2000. In 2000, there were 40 rabid raccoons in eastern Ontario, compared to 45 raccoons and 2 skunks with raccoon strain in 2001. Rabid bats, at 54, set an Ontario record. There do not appear to have been any skunks in 2001 infected with a bat strain.

In the last issue, I pointed out that there was quite a time gap in raccoon rabies cases

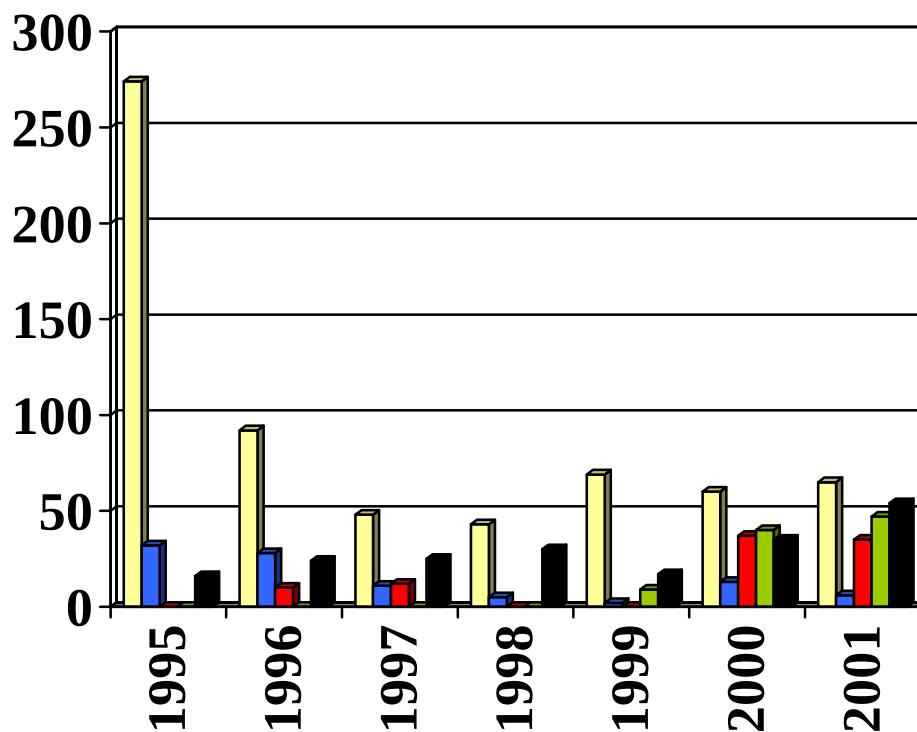


Figure 1. Summary of rabies cases in Ontario, 1995-2001. The left bars (yellow) show arctic fox strain rabies in western Ontario, the western and southern regions of the tables. The next bars (blue) show the central region, which has Peterborough in its center. The red bars show northern Ontario, the green bars give a summary of raccoon rabies, and the rightmost bars show rabid bats.

in eastern Ontario. Unfortunately, that did not hold. The last case in early fall was on 13 September. Then, a roadkill found by trapper Borden Hanna on 2 November was positive. The next case occurred on 6 December. In the remainder of the month, there were five more. Most of these were submitted by Bob Watts, another trapper who is cooperating with MNR, and who is on the lookout for suspicious raccoons in the Athens area. All were within the population reduction or TVR zone from last summer's control program. There may be another case or two that will be added to the 2001 total. The population reduction program results in the submission of thousands (literally!) of brain samples, and not all of those had been tested by year's end. These are tested on a lower priority basis than normal submissions, as there has been no human exposure.

There have been two additional positive raccoons in January 2002.

The biggest change in a rabies situation during 2001 does not show in the numbers. In northern Ontario, the center of rabies activity in 2000, and early in 2001 was in the Cochrane-Iroquois Falls area. In the latter half of the year, rabies disappeared from that region but began to increase in the Sudbury-Lake Nipissing area.

I was saddened to see 4 dogs, 2 cats and 19 livestock. The virus type of a rabid horse in Thunder Bay has not yet been reported. Horses are always a problem because they are moved around a lot. We expect this one to type out either to a bat strain, or to the northern Mississippi Valley skunk strain. However, if the animal attended horse shows in the "wrong" part of southern Ontario, there is some possibility of arctic fox strain.

*Charlie MacInnes  
Rabies Research & Development  
Trent University  
Peterborough*

## INCREASE IN RABID BATS IN ONTARIO DURING 2001 NO CAUSE FOR ALARM

In the last edition of the Rabies Reporter, Charlie MacInnes wrote an article entitled "Holy Fledermaus Batman what hit us" that focused on the increased number of bat rabies cases in Ontario during 2001. I think the most important point in that article is that **very few bats that are submitted for rabies testing are rabid**. Submissions to rabies testing laboratories are generally made by members of the public who have found a dead bat or one that was acting abnormally. That is, most of the submissions are so called "suspect for rabies". When I worked in Alberta, only **4.6%** (39/847) of the bats that were submitted for testing during 1979-1982 were rabid (R. Rosatte, 1985, Can. Vet. J. 26: 81-85). Similar results have been found in "suspect" bat submissions in British Columbia during 1971-1985 where **8.6%** (99/1154) of the bat submissions were rabid (B. Prins and K. Loewen 1988, Can. Vet. J. 29: 41-44), in Alberta during 1973-1978 (**4.6%** of 1,678 bats submitted were rabid – D. Schowalter 1980, Can. J. Comp. Med. 44: 70-76), and in New York where only **4%** of 23,148 bats tested between 1981 and 1997 were rabies positive (C. Trimarchi, 1997 Rabies Annual Summary, NY State Dept of Health report).

The second point I would like to make is that even though rabies infection rates in bats from laboratory "suspect" submissions are generally less than 10% (a lot of variation on a species basis), the prevalence of rabies in the general bat population is even lower. From a survey sample of 860 bats collected in Alberta during 1971-

75, only 1.5% were rabid (Dorward et al. 1977, Can. Vet. J. 18: 341-348). In another sample of survey bats that I collected in Alberta during 1980, none of 48 were positive for rabies (Rosatte 1985, Can. Vet. J. 26: 81-85). These sorts of surveys are not recommended any more, because of the rarity of rabies positives, and the need for very large numbers of bats to be sacrificed.

Generally, an increase in bat rabies cases is a reflection not of an increase in the prevalence of bat rabies but an increase in bat submissions. Increased submissions from the public often follow a media report on bat rabies. This has happened periodically in Ontario during the past. The bottom line is that **there is no need for alarm regarding the increase in rabid bats in Ontario during 2001**; however a few precautions are suggested - do not handle bats with your bare hands, especially ones that are acting abnormally; if you are bitten or scratched by any mammal in Ontario, including a bat, wash the wound immediately and seek immediate medical attention. The best way to catch a bat for rabies testing is to put a bottle over it, and slide the bottle onto a piece of cardboard, then slide the lid on. The other important point to remember is that bats are very beneficial mammals that consume millions of kilos of harmful insects each year. **Do not needlessly destroy bats**. If you have a bat problem there are many non-lethal ways to exclude bats from places of human habitation. Check the Rabies Unit website, or hire an expert. Bats are not difficult to exclude from dwellings.

*Rick Rosatte  
Research Scientist  
Rabies Research & Development  
Trent University  
Peterborough*

## ALL CREATURES WILD ABOUT NEW FACILITY

The Ministry now boasts an enlarged and improved wildlife facility at a location within a short drive of Peterborough.

The Codrington Wildlife Facility – previously home to an MNR fish research station – has been expanded to accommodate skunks, raccoons, foxes, and other animals if required.

The move from the previous facility at Midhurst was greatly needed according to Chris Davies, manager of the Wildlife Research and Development Section. There were three major reasons, he says.

“The previous facility was in one of the fastest-growing regions in Southern Ontario with a great deal of development occurring nearby, says Davies. “This was no longer a location deemed appropriate for an animal-holding facility. The Midhurst facility, with its cages on bare ground, was also in need of considerable investment for major upgrading to current animal-handling standards. And, very importantly, the new facility is only about a 45-minute drive from Peterborough, much closer to our Rabies Research and Development Unit than the prior location.”

Although the animals housed at the facility are used in support of rabies research (bait development such as testing different attractants, and monitoring how long the vaccine stays in the animal’s system), there is never any live rabies virus present. That type of research requires designated lab conditions and is done at a facility in Ottawa.

“The Codrington location provides an opportunity to co-habit with the existing fish research station,

which had previously relocated from Maple,” says Davies who developed the business case for last summer’s relocation and consolidation. With operating costs amalgamated for snow removal and other maintenance, and shared staffing, Davies’s plan explains the move will pay for itself within five years.

“The difference between the two locations is like night and day,” says



Figure 1. Scott Taylor Oversees the Operation of the Ministry of Natural Resources new wildlife facility.

Scott Taylor, wildlife technician based at the facility. With more than 10 years’ work experience with the animal facility, Taylor was instrumental in helping design the compound and implement the move.

Codrington has triple fenced barriers surrounding the five acres used to house the animals, foiling entry or exit of wildlife. Animals are accommodated in structures on four large poured concrete pads, measuring 40 by 100 feet, and four smaller ones that are 28 by 28 feet. Taylor notes that this concrete is sloped, which assists cleaning and smell reduction, and provides the animals cleaner cages. Each structure is roofed, as opposed to the tree canopy over the previous cages.

Davies compliments Taylor on successfully overseeing details of the efficient move of both equipment and animals from Midhurst to Codrington. This occurred between July 30 and

August 2, 2001 during very warm weather and involved eight transport trailers carrying the caging, and eight pick-up trucks with animals.

“The animals fared quite well,” Taylor recalls, noting that planning the move took considerable time to ensure that stress for all creatures was kept to a minimum. “I had a lot of help from the Rabies Unit staff in transporting animals and lifting

cages.”

The Codrington facility has allowed capacity to be increased by more than 30 per cent – from 250 to approximately 350 animals. The improvements have created animal workrooms at current animal-handling standards. With four staff now at one facility, Davies says it’s a more enjoyable place to work, and provides more efficient scheduling.

Taylor notes that care for animals at the facility is governed by both the Canadian Council for Animal Care and the MNR’s own Animal Care Committee.

*Kathleen Bain  
Communications Officer  
Wildlife Research and  
Development Section  
Peterborough*

## RABIES CONTROL IN NEW BRUNSWICK IN 2001

### INTRODUCTION:

The province of New Brunswick, which had been previously free of terrestrial rabies, received its first case of the raccoon strain of rabies on 12 September 2000. The virus gained entry into the province via the international boarder with Maine, first surfacing in the town of St. Stephen in the southwest corner of the province. The case was confirmed by the Canadian Food Inspection Agency (CFIA) in a striped skunk, within the town limits of St. Stephen. Over the next 12 months a total of 59 more cases of the raccoon strain of rabies were confirmed in the St. Stephen area. Of these, 51 of the cases were diagnosed in raccoons, the other nine positive cases were found in skunks. An additional case was recorded on 31 October 2001 in a raccoon. All 61 of the positive cases were diagnosed within 18 kilometers of St. Stephen.

A program to slow the spread of rabies into the province, and reduce the number of cases occurring was initiated 15 October 2001, implementing a method of disease control known as Point of Infection Control (PIC). Thirty seven trappers worked a total area of 645 km<sup>2</sup>, in a time frame of five weeks between 15 October and 18 November. The desired outcome of the program was to slow the spread of raccoon rabies into the province, reduce the number of cases occurring, and lay down the groundwork for future eradication plans.

### METHODOLOGY:

The first steps in planning the point of infection (PIC) program were to learn from other jurisdictions that had already implemented similar programs in the past. Much information

was gained from the experiences of the Ontario rabies unit that had completed their first three PIC programs in 1999. With the disease already having been present in the area for 12 months, and spreading to surrounding areas, the PIC methods had to be tailored to the circumstances.

A PIC consists of three parts: firstly, the removal of high risk species (raccoons, skunks, foxes) that could have had contact with the rabid specimen, and could be potentially incubating the disease themselves. An area within a five-km radius of a positive rabies case is to be trapped, and the high-risk species within that area euthanized. The second component of the plan is to vaccinate high-risk species (including cats) in an area between a five-km radius and a ten-km radius of each positive case. The idea of vaccinating the high risk species is that any animal carrying the virus out of the depopulation zone wouldn't be able to pass on the virus to animals in the trap-vaccinate-release (TVR) zone that have been previously vaccinated, thus breaking the spread of rabies. The third aspect of the plan involves the aerial baiting of an area within a 50-km radius of each case, with oral vaccination baits. Due to lack of funds, the third aspect of the plan (aerial baiting) was unable to commence this year.

In the planning stages of the program, each positive case was plotted onto a map and radiuses of five and ten kilometers were drawn around each case. The area within the inner five-kilometer zone being the depopulation zone, and the area a further five kilometers out being the TVR zone. Each zone was broken into "cells" meant to be approximately ten square kilometers each. When it came time to plot the cells on the map, we wanted the boundaries to follow definable features on the ground (roads and rivers). This made it easy for the trappers to define their boundaries and access as much of the perimeter as possible. The total

area of 645 km<sup>2</sup> was divided into 47 different cells, 20 depopulation cells and 27 TVR cells. In order to get the area done that we wanted with the money we had, it was necessary to make each cell a little larger than recommended (average 13.71 km<sup>2</sup>). To carry out the work, 37 trappers were hired throughout the program, most of whom were fur trappers with previous trapping experience. Regardless of experience, each trapper attended a two-day training session designed to give them a background understanding of the rabies virus, other wildlife diseases, vaccination techniques, trapping methods, record keeping, health and safety issues, and reviewing the program guidelines.

*Depopulation zone:* The Depopulation zone was broken into 20 cells, seventeen of which were surrounding the town of St. Stephen, and the other three were centered around the village of Basswood Ridge, eighteen kilometers northwest of St. Stephen (Figure 1). The area covered was 258.79 km<sup>2</sup>, averaging 12.94 km<sup>2</sup> per cell. The method used to euthanize the animals within the designated cells were instant kill traps (conibears). Traps were set to target raccoon and skunk populations, but as the inherent problem with instant kill traps is not being able to discern between captures of desired species and non target species, incidental catches did occur. Knowing that there was a potential to catch cats and dogs, a large scale media campaign was initiated before trapping commenced to warn the public to keep their pets indoors or close to home during the trapping campaign. In the media campaign, air time was purchased on local radio; print ads were published in the local newspaper; pamphlets were delivered by mail to affected residences; and the health minister urged residents to keep their pets indoors at his press release in St. Stephen. Also reducing the chance for pet capture was our compliance with provincial trapping



regulations that state no trap may be set within 300m of any residence. This limited catches of household pets, but also limited the catches of urban dwelling raccoons and skunks.

Each of the 20 depopulation cells was assigned a trapper with a hundred instant kill traps. Trappers were asked to bring whatever number of conibears they owned, and the program purchased the rest (1200). Trap sizes used were either the 160 size or 220 size of conibears. Every trapper was to operate 100 traps per day. Because of the effort involved in setting each conibear trap, it often took a trapper a few days of setting traps before he had his full 100 traps set. Traps were set in areas likely to catch raccoons and skunks. The traps were baited with sardines, which due to the cold weather often lasted a couple of days. Each set trap was checked daily. When an animal was captured, it was recorded, bagged, and brought to a central location. Each day, the carcasses were delivered to a municipal landfill site where they were buried in a pit at a minimum depth of 20 feet. Each day, the pit was covered with a sealant layer. When the program was completed, the pit was sealed off. The depopulation program started on 21 October with two days of training sessions, and traps being set out on 23 October. The trapping ran for eight days with traps being pulled 31 October. The reasons we decided to use the conibear instant kill traps were the facts that we didn't have enough live-traps to supply all the trappers with (trappers were able to use their own conibear traps), and the fact that there simply were not enough vaccinated trappers in the province. Since trappers may get bitten or scratched by animals caught in the live traps, no trapper was allowed to operate the live traps without being fully vaccinated. Trappers who had received their second shot of the human diploid vaccine were allowed to handle dead animals caught in the

conibear traps while wearing proper safety equipment. If we had waited for those trappers to receive their third shot, the commencement of the depopulation project would have been delayed too late in the season, limiting the success of the program.

**TVR Zone:** The TVR program consisted of 27 cells, covering an area of 385.72 km<sup>2</sup> averaging 14.92 km<sup>2</sup> in size. The TVR cells were situated around the outer perimeter of the depopulation cells (Figure 1). Each cell was set with 100 live traps (Tomahawk size 16 and 18 traps). Each day, the traps were checked and high-risk species (raccoons, skunks, foxes, and cats) were vaccinated intramuscularly with 1cc of rabies vaccine (Imrab 3). Raccoons, skunks, and foxes were also ear-tagged to identify recaptures. Age and sex data was collected, and then animals were released at site of capture. The TVR portion of the program started on 15 October and ran through to 18 November. The trappers were broken into three different groups: A, B, and C. Each group trapped for a period of twelve days with two initial days of training. Group A consisted of six trappers, trapping from 18-30 October. Group B consisted of six trappers, trapping from 23 October to 4 November. Group C consisted of fourteen trappers, trapping from 6 November to 18 November.

All work done on the animals in the TVR project was performed without the aid of anesthetics. Animal's movements were restricted by placing

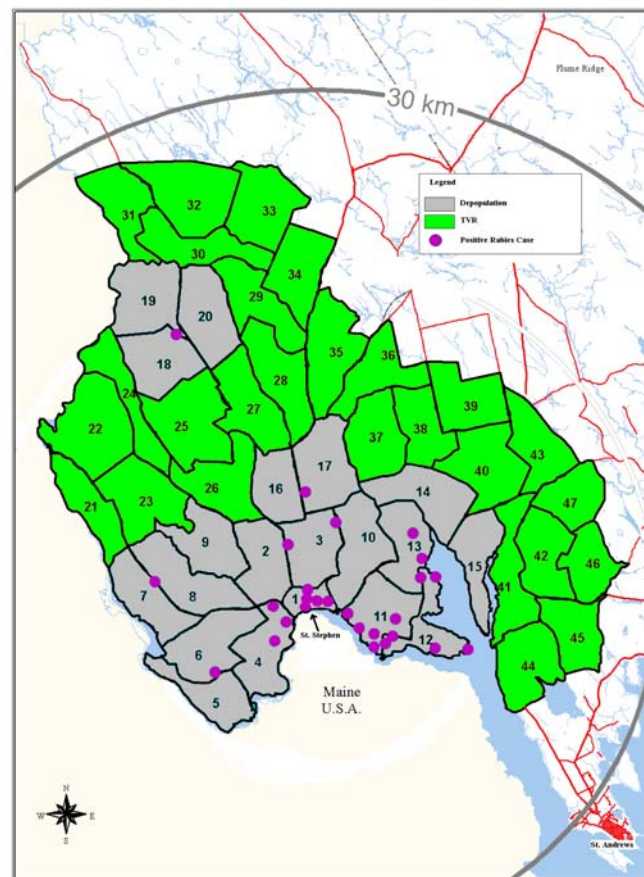


Figure 1. Map of rabies control project area

a smaller size trap inside the trap with the animal and confining them to the back of the trap. While the animal was confined, a vaccination was administered in the thigh/hip, and an ear-tag was crimped on one of its ears. Before releasing the animal, each trapper recorded the animal's age (juvenile or adult), and the sex of the animal. Each trapper working in the TVR project was required to have been fully vaccinated for the rabies virus prior to working with the live animals. To prepare the trappers for vaccinating live animals, hands-on training sessions were provided to show the trappers how to: 1) safely handle a live animal in a live trap, 2) vaccinate an animal through the side of the cage, and 3) ear-tag an animal through the side of a cage. Special training was also provided to teach the trappers how to safely vaccinate

skunks. To deal with skunks, each trapper would wear coveralls, gloves, safety glasses, and use sheet plastic to wrap around the cage containing the skunk. Once the skunk was confined in the cage, normal vaccinating/ear-tagging procedures followed with extra caution observed of the skunks "spraying" potential.

### RESULTS:

**Depopulation:** The entire depopulation zone consisted of 20 trappers in 20 cells, and covered an area 258.79 km<sup>2</sup>. The time frame was eight nights of trapping between 23 October and 31 October. During this time 11,086 traps were set, and 181 traps were disturbed (set off, missing, etc). This left a net amount of 10,905 traps available to capture animals (Table 1). There was a potential for 16,000 traps to have been set (20 trappers x 100 traps per night x 8 nights). Due to fact that it took a few nights to get all 100 traps set in each cell, that potential was never realized. The total capture of targeted species was 103 raccoons, and 17 skunks (Table 1).

Unfortunately, as a side effect of using instant kill traps, there were also incidental catches of 20 cats (none had any collars or identification) and three dogs (each dog was accounted for by owner). There were also incidental catches of 11 porcupines, 7 rabbits, 1 weasel, 1 squirrel, 1 fisher, 1 mink, 1 coyote, 1 beaver, and 1 crow.

The capture of raccoons per night gradually increased as more traps were placed in each cell. As more raccoons were removed from the cells, the captures per night decreased. The last night of trapping defies the trend (Figure 2). Because the trapping period and sample size were small, any trends alleged by this data should be viewed with caution.

**TVR:** The TVR zone was comprised of 27 cells covering an area of 385.72 km<sup>2</sup>. The area was trapped

| Cell           | Rac-<br>coons | Skunk<br>s | Traps<br>set | Dis-<br>turbed | Net          | Cell Size<br>(km2) |
|----------------|---------------|------------|--------------|----------------|--------------|--------------------|
| 1              | 6             | 5          | 511          | 16             | 495          | 4.65               |
| 2              | 2             | 0          | 546          | 0              | 546          | 13.04              |
| 3              | 3             | 1          | 558          | 4              | 554          | 12.67              |
| 4              | 8             | 1          | 630          | 48             | 582          | 12.5               |
| 5              | 13            | 1          | 393          | 1              | 392          | 11.31              |
| 6              | 11            | 2          | 550          | 0              | 550          | 15.33              |
| 7              | 0             | 0          | 700          | 5              | 695          | 12.83              |
| 8              | 2             | 0          | 700          | 10             | 690          | 16.1               |
| 9              | 0             | 0          | 566          | 0              | 566          | 12.94              |
| 10             | 1             | 3          | 612          | 11             | 601          | 15.34              |
| 11             | 2             | 2          | 276          | 6              | 270          | 12.53              |
| 12             | 10            | 1          | 672          | 10             | 662          | 9.48               |
| 13             | 7             | 1          | 523          | 20             | 503          | 12.23              |
| 14             | 6             | 0          | 423          | 1              | 422          | 15.01              |
| 15             | 12            | 0          | 381          | 8              | 373          | 11.53              |
| 16             | 1             | 0          | 667          | 2              | 665          | 10.88              |
| 17             | 6             | 0          | 630          | 15             | 615          | 15.21              |
| 18             | 4             | 0          | 450          | 17             | 433          | 14.2               |
| 19             | 3             | 0          | 700          | 1              | 699          | 15.57              |
| 20             | 6             | 0          | 598          | 6              | 592          | 15.44              |
| <b>Totals</b>  | <b>103</b>    | <b>17</b>  | <b>11086</b> | <b>181</b>     | <b>10905</b> | <b>258.79 km2</b>  |
| <b>Average</b> | 5.15          | 0.85       | 554.30       | 9.05           | 545.25       | 12.94 km2          |

Table 1. Raccoon and skunk captures, and traps set per cell

between 18 October and 18 November. Each cell was trapped for 12 nights. The total number of traps set over the TVR program was 30,249. When the number of disturbed traps is subtracted, there was a net amount of 29,250 traps available to capture animals. A total of 297 raccoons were vaccinated and ear-tagged. Thanks to numerical ear tags, it was determined that 188 raccoons re-entered traps (recaptures). Recaptured animals were recorded and released. The 297 captures and 188 recaptures combine for a total of 485 raccoons entering traps in the TVR program. In addition, 98 skunks were captured, vaccinated, and ear-tagged. Of those individuals, there was a total of 217 recaptures, some entering the traps more than once (thus counting as more than one recapture). Captured and recaptured skunks combine for a total of 315 skunks entering traps. There were also 129 cats captured, 97 of those were vaccinated (suspected pet cats were not vaccinated). There were 23 cats recaptured

(recognized by magic marker previously marked inside the ear), making for a total of 152 cats that entered traps (Table 2).

Incidental catches consisted of 55 rabbits (snowshoe hares), 50 squirrels (mostly red squirrels), 50 birds (14 blue jays, 14 gray jays, 2 ruffed grouse, 2 sparrows, 1 gray slate juncos, 17 undetermined), 7 porcupines, 4 fishers, 3 muskrats, 3 weasels, and 2 dogs.

In all, 698 animals were captured of which raccoons comprised 43% of the catch and skunks comprised 14% of the catch. Estimated population densities were unobtainable as the sample size was too small to effectively calculate estimated populations. However, a minimum density was possible to calculate with the known catches from each cell. This could be useful as an index for future work. The minimum density for the entire TVR area was 0.855 raccoons per square kilometer. The highest minimum density for any TVR cell (cell

36) was 2.051 raccoons per square kilometer.

#### COSTS OF PROGRAM:

The cost of the entire PIC project was \$317,000 (Table 3). This was within the allotted budget for the program. Costs of this PIC will be significantly higher than future programs as many of the start-up supplies had to be purchased outright. Almost half of the budget was allotted to buying traps. The costs worked out to about \$492 per square kilometer. The cost for future programs would be much lower.

#### DISCUSSION:

The objective of the 2001 PIC was to slow the spread of rabies into the province, reduce the number of cases occurring, and provide groundwork for future eradication work. The implementation of the PIC project was a success. The effectiveness of the program will be judged in the months to come, based on how far the disease may spread from the St. Stephen area and how many more cases of rabid animals continue to surface.

The total catches of raccoons were lower than expected. Reasons for the low captures probably stem from a number of sources. One of the main problems was that the program

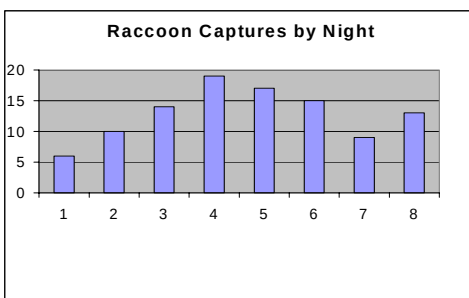


Figure 2. Raccoon captures per night

| Cell           | Raccoons    |             |              | Skunks      |             |              | Cats        |             |             |             |
|----------------|-------------|-------------|--------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|
|                | Capture     | Recapture   | Total        | Capture     | Recapture   | Total        | Capture     | Vaccinated  | Recapture   | Total       |
| 21             | 21          | 10          | 31           | 6           | 15          | 21           | 9           | 9           | 0           | 9           |
| 22             | 6           | 8           | 14           | 0           | 0           | 0            | 2           | 2           | 0           | 2           |
| 23             | 6           | 4           | 10           | 1           | 0           | 1            | 0           | 0           | 0           | 0           |
| 24             | 19          | 6           | 25           | 4           | 2           | 6            | 5           | 3           | 0           | 5           |
| 25             | 8           | 4           | 12           | 2           | 3           | 5            | 4           | 3           | 0           | 4           |
| 26             | 4           | 4           | 8            | 2           | 2           | 4            | 0           | 0           | 0           | 0           |
| 27             | 9           | 8           | 17           | 0           | 5           | 5            | 1           | 1           | 0           | 1           |
| 28             | 9           | 7           | 16           | 0           | 3           | 3            | 3           | 0           | 0           | 3           |
| 29             | 14          | 15          | 29           | 5           | 19          | 24           | 2           | 0           | 0           | 2           |
| 30             | 3           | 3           | 6            | 0           | 3           | 3            | 2           | 1           | 0           | 2           |
| 31             | 9           | 5           | 14           | 1           | 3           | 4            | 0           | 0           | 0           | 0           |
| 32             | 3           | 1           | 4            | 0           | 0           | 0            | 2           | 2           | 0           | 2           |
| 33             | 7           | 5           | 12           | 9           | 38          | 47           | 2           | 2           | 0           | 2           |
| 34             | 14          | 6           | 20           | 6           | 8           | 14           | 3           | 3           | 3           | 6           |
| 35             | 15          | 6           | 21           | 3           | 10          | 13           | 8           | 5           | 0           | 8           |
| 36             | 26          | 16          | 42           | 4           | 19          | 23           | 28          | 21          | 4           | 32          |
| 37             | 7           | 2           | 9            | 0           | 0           | 0            | 0           | 0           | 0           | 0           |
| 38             | 15          | 7           | 22           | 7           | 20          | 27           | 7           | 3           | 0           | 7           |
| 39             | 5           | 5           | 10           | 0           | 8           | 8            | 3           | 3           | 2           | 5           |
| 40             | 7           | 2           | 9            | 4           | 8           | 12           | 7           | 5           | 9           | 16          |
| 41             | 27          | 8           | 35           | 15          | 1           | 16           | 15          | 14          | 1           | 16          |
| 42             | 14          | 9           | 23           | 5           | 8           | 13           | 9           | 9           | 0           | 9           |
| 43             | 16          | 20          | 36           | 4           | 7           | 11           | 9           | 7           | 3           | 12          |
| 44             | 7           | 0           | 7            | 10          | 8           | 18           | 3           | 2           | 1           | 4           |
| 45             | 5           | 6           | 11           | 1           | 0           | 1            | 2           | 0           | 0           | 2           |
| 46             | 6           | 3           | 9            | 3           | 1           | 4            | 0           | 0           | 0           | 0           |
| 47             | 15          | 18          | 33           | 6           | 26          | 32           | 3           | 2           | 0           | 3           |
| <b>Totals</b>  | <b>297</b>  | <b>188</b>  | <b>485</b>   | <b>98</b>   | <b>217</b>  | <b>315</b>   | <b>129</b>  | <b>97</b>   | <b>23</b>   | <b>152</b>  |
| <b>Average</b> | <b>11.0</b> | <b>6.96</b> | <b>17.96</b> | <b>3.63</b> | <b>8.04</b> | <b>11.63</b> | <b>4.78</b> | <b>3.59</b> | <b>0.85</b> | <b>5.63</b> |

Table 2. Raccoon, skunk, and cat totals per cell.

was initiated late in the year, which limited the capture success of trappers. Raccoon and skunk movements are typically lower at this time of the year as they prepare to den. Another factor reducing capture successes were the limitations of trapping within 300m of any residences in the depopulation zone. Raccoons and skunks can be highly urban animals and densities are typically higher in urban areas. We may have missed opportunities to catch these animals. Much of the area in any given cell was off limits for trapping due to the 300m law and areas available were difficult to access. In future, we would have a profile of experienced, fully vaccinated trappers, and would be able to perform a population reduction program using live-traps, euthanizing desired species only.

This, in conjunction with an earlier trapping season, would increase the capture success as raccoons and skunks would be more active, and we would be able to trap in closer proximity to residences. One further factor that limited capture success (although it supported the program efforts) was the removal of many raccoons and skunks by local residents after the reporting of rabies in the area. Nuisance wildlife control operators in the St. Stephen area were kept busy and removed many specimens (local NWCOs Ben Woodard and Leigh Waldron reported removing around 200 raccoons and skunks from the area this year). The rabies virus also claimed a minimum of 61 raccoons and skunks. These forces potentially removed a large portion of

|                 |                     |
|-----------------|---------------------|
| Personnel wages | \$113,674.39        |
| Accommodations  | \$19,205.00         |
| Equipment       | \$175,692.47        |
| Media           | \$ 7,307.63         |
| Other           | \$ 1,736.99         |
| <b>TOTAL</b>    | <b>\$317,616.48</b> |

Figure 3. PIC Expenses

the population, reducing animal densities.

Although captures were not as high as hoped, the vaccination of almost 500 animals will go a long way in controlling the virus outbreak. Future recommendations would be that trapping should occur in the summer and early to mid fall months, and that live traps be used in all aspects of a trapping program. Many smaller improvements and suggestions have also been made for future work.

*Tore Buchanan*  
*Rabies Control Program*  
*Government of New Brunswick*

## SUMMARY OF RABIES IN NEW YORK IN 2001

For the first time since 1992 New York State has lost the distinction of having the largest number of specimens diagnosed for rabies and the largest number of rabies cases. This distinction has now been rewarded to the state of Texas as a result of an intense epizootic of skunk rabies in eastern Texas. The 821 rabies positive specimens diagnosed by the rabies laboratory was the lowest number recorded for this state since 1991 but only 2.50% (21) fewer, than the previous year. This consistency of numbers reflects the true enzootic nature of raccoon rabies in New York State. Although the number of positive cases overall for the year de-

clined, the number of positive raccoons rose 25 or 5.90%.

The New York State Department of Health received 8961 animals for rabies examination during the year, which was 10.70% lower than the previous year and 6.10% fewer than the average of the previous five years. The New York City Health Department rabies laboratory received 693 animals for examination, for a statewide total of 9666 examinations for rabies in animals. Specimens were received from every New York State county with a range of 923 specimens from Westchester county to 6 specimens from Hamilton county. Kings County had one rabid cat (raccoon strain) that was found in a subway tunnel. This was the first incursion of raccoon rabies into this county. The Wadsworth Center examined 3 samples from human patients for the purpose of antemortem diagnosis of rabies (all rabies negative).

The 51 animal species received for rabies diagnosis were representative of every major taxa of mammals in New York State, indicative of assurances of epizootiological confidence in the disease activity in the state. Domestic species comprised 31% (2829) and wild species 68.50% (6144) of all animals tested. The laboratory examined 1857 cats (20.7% of all animals tested), 717 dogs (8.0%), 185 foxes (2.1%), 979 raccoons (11.0%), 388 skunks (4.3%), 244 rodents and lagomorphs (2.7%), 103 cattle (1.1%), 316 other wild (3.5%) and 80 other domestic (0.90%).

For the fourth consecutive year, the largest number of animals tested from any single taxa was bats (3936) which represented 43.80% of all animals tested. Although the total number of animals tested was down from previous years, the number of tested bats has remained steady during the past four years. There were 3926 bats tested in 2001: 2743 (69.90% of all bats tested) big brown bats, 1058 (27%) little brown bats, 6(.15%) hoary

bats, 36 (.92%) red bats, 34 (.87%) eastern pipistrelle bats, 6(.15%) silverhaired bats and 43 (1.10%) unidentifiable. The 113 rabid bats was the third highest annual total in the states history, and 11.90% higher than the average of the previous five years (101). The rabid bats included 15 big brown bats (84.10% of all rabid bats), 8 little brown bats (7.10%), 3 eastern pipistrelle (2.70%) 1 hoary bat, 1 red bat and 1 bat unidentifiable. The percent positive for each bat taxa, was: big brown bat 3.50%, little brown bat 0.76%, hoary bat 16.60% red bat 2.70% silverhaired bat 0%, eastern pipistrelle 8.80% and unidentified, 2.30%. Overall, in 2001, the rabies positivity rate among all bats tested was 2.90%, following a trend seen in the past few years where the total positivity rate in bats has declined (the average for the 5 year period of 1995 to 1999 was 3.40%). An increase in testing of bats, due to new Federal guidelines for bat exposures, is the suspected cause of this reduction of total positive bats in relation to total bats tested. Among the rabid bats 45 (39.80%) had reported human contact, 25(22.10%) contact with a cat, 17(15.10%) contact with a dog, and 26(23%) had no reported contact, 2 (1.8%) were a juvenile, 61(54%) were female and 44(39%) were male and 2 (1.8%) were unidentifiable to gender.

There were 47 laboratory-confirmed rabid domestic animals in 2001, including 32 cats (68.10% of all domestic animal cases), 6 bovines (12.80%), 3 rabbits (6.40%), 3 horses (6.40%), 2 dogs (4.30%) and 1 goat (2.10%). The three domestic rabbits were all raccoon strain of rabies virus. The rabbits were caged outdoors and were apparently bit through the cage wiring. Two rabbits were observed being attacked by raccoons.

The 776 rabid wild animals accounted for 94.3% of all rabid animals in 2001. This is the lowest number of rabid animals in the previous 10 years and 22.4% lower than the



average for the past 5 years. The rabies positivity rate among all wildlife examined was 12.7%. Of all rabid wild animals tested in 2001 85.8 % were terrestrial species and 14.2% bat species. There were 444 raccoons (67% of all terrestrial species found rabid), 168 striped skunks (25.3%), 45 foxes (6.8%), 12 woodchucks, (1.8%), and one beaver that was found to be rabid. Among all animals submitted for rabies examination the rabies positivity rate was 8.7%.

For more information visit the rabies laboratory website at: [www.wadsworth.org/rabies](http://www.wadsworth.org/rabies)

*Robert J. Rudd  
Director, Rabies Lab  
Wadsworth Centre  
New York State Dept. of Health*

*Note: New York City Health Department data provided by Dr. Igbal Poshni.*

## 2001 Ohio Rabies Summary

During 2001, 52 animals were confirmed positive for rabies in Ohio. Bats were again the most common rabid animal, accounting for 50 of the 52 positives. The other two confirmed rabid animals were a cow and a raccoon. This is the same number of rabid animals as was reported last year, except in 2000, all rabies cases were in bats. A map is attached showing the distribution of 2001 rabies cases.

In 2001, the Ohio Department of Health Laboratory (ODHL) tested 4,182 animals for rabies. Four species of animals made up over 92% of animals tested by the ODHL. These species were raccoons (1091), cats (999), dogs (927) and bats (832). Overall, the number of animals tested has gradually decreased from a high of 5,321 animals in 1997.

Regarding testing of bats in

2001, 6% were positive. During the previous five years, 4.5% (4.0-5.2%) were positive. This increase, though, is not statistically significant, and does not represent a change in the bat rabies picture. It more likely reflects the selection process used in submitting bats for testing. In 2000, there was a high level of media attention given to bat rabies, probably encouraging testing of some bats unnecessarily. With possibly more discriminatory submission of bats in 2001, fewer bats were submitted, and ones that were may have had more public health significance.

The rabid cow was from Meigs County. This cow was part of a small group that was exposed to a sick raccoon several weeks earlier. In addition, bats were frequently observed in the barn. On October 2, the owner of the cow noticed that the cow was acting unusual. Wearing gloves, he examined the mouth and throat to see if the cow was choking on anything. Finding nothing, he called his veterinarian, who examined the animal on October 4. He suspected rabies. The cow died within a day and was submitted for rabies testing. CDC did nucleotide sequencing of rabies virus RNA, which indicated the cow was infected with the variant of rabies virus associated with eastern pipistrelle and silver-haired bats. No other animals were subsequently affected.

The positive raccoon was submitted from Mahoning County and marked Ohio's first raccoon-strain rabies case since November 1999. It was Mahoning County's first raccoon-strain rabies case since March 1998. This was an abnormally acting raccoon from Lowellville, in an area less than one mile from the Penn-

sylvania border. It is unknown whether the animal was infected in Ohio or if this animal developed rabies in Pennsylvania and wandered across the border into Ohio. Mahoning County will be monitoring this area vigorously in the coming year.

As a result of potential exposures to animals that tested positive to rabies in Ohio, 36 people (17 adults and 19 children) received post-exposure prophylaxis (PEP). All of these were due to bat-strain exposures, of which five were due to the cow exposure.

Thirteen dogs and 18 cats had either known or potential exposure to laboratory-confirmed rabid bats. For the dogs, eight were current on their rabies vaccination. They were boosted and put under a 45-day observation period. Three were quarantined for six months, and two were euthanized. Of the 18 cats exposed to rabid bats, six were current on their rabies vaccination. These were

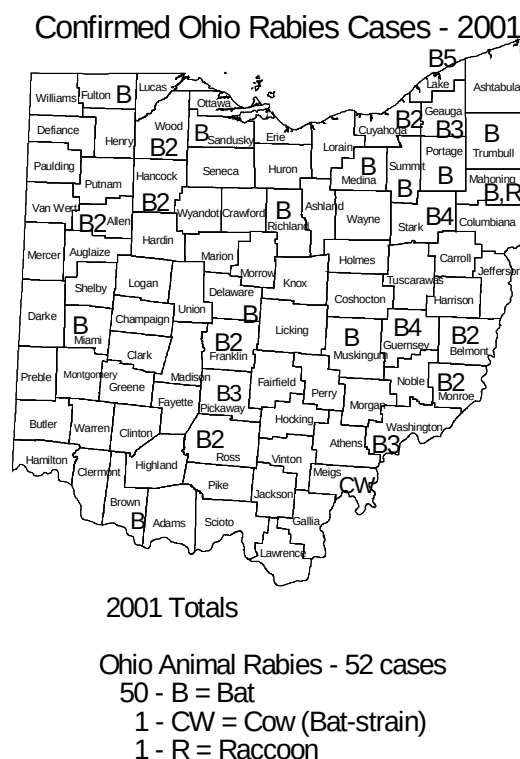


Figure 1. Distribution of rabies cases in Ohio in 2001.

boosted and put under a 45-day observation period. Seven cats were euthanized and five were quarantined for six months. In most cases, animals placed under the 6-month quarantine were vaccinated after the 5th month, according to recommendations. Two dogs and four cats were vaccinated shortly after the exposure, before intervention by the local health department.

*Courtesy of  
Ohio Department of Health*

## Ohio Oral Rabies Vaccination 2001 Update

### Background:

Beginning in the late 1970's, a strain of rabies associated with raccoons rapidly spread along the east coast of the United States. As it invaded new areas, there was an explosive increase in rabid raccoons and in the wild and domestic animals that had contact with them. People were also becoming exposed, with up to a 10-fold increase in rabies treatments documented in newly affected areas. In spring of 1997, raccoon rabies moved into northeast Ohio from Pennsylvania. ODH, with support of local, state, and federal agencies, adopted a new tool to stop raccoon rabies from spreading throughout the state - a program to vaccinate wild raccoons with an oral rabies vaccine (ORV). By immunizing enough of the wild raccoon population, the disease would die out, reducing the risk to residents, pets, livestock and wildlife.

Since 1997, ORV has been distributed in a 25 mile-wide zone along the Ohio - Pennsylvania border using fixed wing aircraft in rural areas and ground/vehicle teams in urban areas. Operations are conducted spring and fall. For a detailed history, refer to the ODH Zoonotic Diseases webpage at [www.odh.state.oh.us/ODHPrograms/ZOODIS/ZooMain1.htm](http://www.odh.state.oh.us/ODHPrograms/ZOODIS/ZooMain1.htm) and select

Oral Rabies Vaccination and then select ORV History in Ohio.

### 2001 Review:

The Spring 2001 Oral Rabies Vaccination baiting was conducted in late March. The 2,509 sq. mi. treatment area, the same area baited in 2000, included the four border counties (Ashtabula, Trumbull, Mahoning and Columbiana Counties) and parts of Jefferson and Carroll Counties. Bait densities remained at 75 baits/sq. km. for aerial baiting and 65 baits/sq. km. for ground baiting. As in the previous fall's baiting, 520,560 baits were distributed, with about 85% by air and 15% by ground baiting teams.

The Fall 2001 bait operation expanded to include the remainder of Jefferson County, parts of Harrison, Belmont, and Monroe Counties, and areas in West Virginia and Pennsylvania. Support for the expanded area came from the USDA. Prior to the baiting, West Virginia initiated active surveillance to establish the western front of the epizootic. Using that information, the flight lines were extended south and west to a point south of Charleston, West Virginia. Pennsylvania's participation was limited to a 19 mile-wide stretch along Lake Erie's southeast shore and connected Ohio's ORV immune barrier in Ashtabula County to New York's barrier in Chautauqua County. The Pennsylvania baited area involved 724 sq. mi. (1,875 sq. km.) in two counties, Ohio's baited area increased to 3,289 sq. mi. (8,518 sq. km.) in nine counties and the West Virginia barrier included 4,582 sq. mi. (11,867 sq. km.) in 22 counties.

The baiting began September 10 with an optimal completion time of eight days with good weather and three

### 2001 ORV

#### Immune Barrier

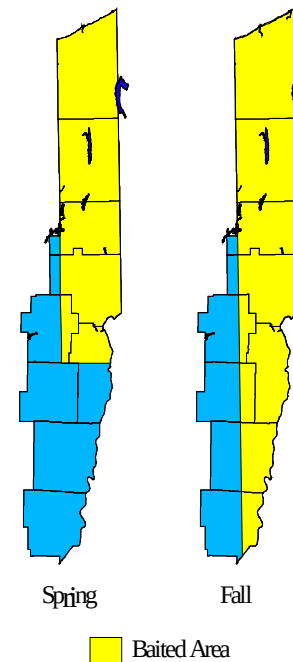


Figure 1. Bait drop areas in Ohio in 2001.

airplanes. The September 11 terrorist attacks in New York, Washington, and Pennsylvania, prompted numerous FAA shutdowns and restrictions of our aerial baiting. The airplane baiting eventually finished on September 25. Ground baiting continued on schedule. Bait density was 75 baits/sq. km., except that the Ohio ground baiting density remained at 65 baits/sq. km. Over 1.6 million baits were distributed in Fall 2001, including 656,985 baits in Ohio. This was an increase of 26% compared to Spring 2001.

USDA Wildlife biologists conducted pre-baiting and post-baiting

| State         | Area<br>(Square miles) | Hand<br>Distribution | Plane & Helicopter<br>Distribution |
|---------------|------------------------|----------------------|------------------------------------|
| Ohio          | 3,289                  | 60,840               | 596,145                            |
| Pennsylvania  | 724                    | 138,000              | 0                                  |
| West Virginia | 4,330                  | 60,840               | 763,689                            |
| Total         | 8,343                  | 259,680              | 1,359,834                          |

Table 1. Distribution of baits in 2001.

## OHIO RABIES TESTING AND PERCENT POSITIVE

| Species      | 1980-1989 |        |               | 1990-1999 |        |              | 2000-2001 |        |              |
|--------------|-----------|--------|---------------|-----------|--------|--------------|-----------|--------|--------------|
|              | Positive  | Tested | % Pos         | Positive  | Tested | % Pos        | Positive  | Tested | % Pos        |
| Bat          | 135       | 4,445  | <b>3.04%</b>  | 178       | 4,198  | <b>4.24%</b> | 102       | 1,924  | <b>5.30%</b> |
| Cat          | 3         | 6,343  | <b>0.05%</b>  | 6         | 8,833  | <b>0.07%</b> |           | 2,041  |              |
| Chinchilla   |           | 3      |               |           | 2      |              |           | -      |              |
| Chipmunk     |           | 320    |               | 1         | 155    | <b>0.65%</b> |           | 33     |              |
| Cow          | 19        | 531    | <b>3.58%</b>  | 1         | 451    |              | 1         | 38     | <b>2.63%</b> |
| Coyote       |           | 6      |               |           | 28     |              |           | 5      |              |
| Deer         | 1         | 21     | <b>4.76%</b>  |           | 26     |              |           | 4      |              |
| Dog          | 12        | 6,989  | <b>0.17%</b>  | 1         | 8,906  | <b>0.01%</b> |           | 1,897  |              |
| Ferret       |           | 327    |               |           | 213    |              |           | 29     |              |
| Fox          | 17        | 690    | <b>2.46%</b>  | 3         | 400    | <b>0.75%</b> |           | 49     |              |
| Gerbil       |           | 57     |               |           | 10     |              |           | 1      |              |
| Goat         |           | 71     |               |           | 104    |              |           | 19     |              |
| Groundhog    | 2         | 577    | <b>0.35%</b>  |           | 325    |              |           | 64     |              |
| Guinea Pig   |           | 29     |               |           | 9      |              |           | 1      |              |
| Hamster      |           | 241    |               |           | 54     |              |           | 9      |              |
| Horse        | 9         | 206    | <b>4.37%</b>  | 4         | 273    | <b>1.47%</b> |           | 57     |              |
| Human        |           | 7      |               |           | 9      |              |           |        |              |
| Llama/Alpaca |           | 2      |               |           | 16     |              |           | 16     |              |
| Mink         |           | 47     |               |           | 32     |              |           | 9      |              |
| Mole         |           | 75     |               |           | 37     |              |           | 7      |              |
| Mouse        |           | 354    |               |           | 123    |              |           | 36     |              |
| Monkey       |           | 12     |               |           | 4      |              |           |        |              |
| Mule/Donkey  |           | 5      |               |           | 2      |              |           | 3      |              |
| Muskrat      |           | 112    |               |           | 77     |              |           | 6      |              |
| Opossum      | 1         | 417    | <b>0.24%</b>  |           | 330    |              |           | 76     |              |
| Pig/Hog      |           | 25     |               |           | 21     |              |           | 3      |              |
| Rabbit       |           | 328    |               |           | 119    |              |           | 15     |              |
| Raccoon      | 3         | 3,126  | <b>0.10%</b>  | 86        | 7,264  | <b>1.18%</b> | 1         | 2,142  | <b>0.05%</b> |
| Rat          |           | 316    |               |           | 160    |              |           | 27     |              |
| Rodent       |           | 496    |               |           | 14     |              |           | 3      |              |
| Sheep        |           | 66     |               |           | 120    |              |           | 5      |              |
| Shrew        |           | 30     |               |           | 19     |              |           | 1      |              |
| Skunk        | 172       | 1,176  | <b>14.63%</b> | 11        | 453    | <b>2.43%</b> |           | 61     |              |
| Squirrel     |           | 770    |               |           | 414    |              |           | 99     |              |
| Voile        |           | 7      |               |           | 9      |              |           |        |              |
| Weasel       |           | 50     |               |           | 11     |              |           | 1      |              |
| Wolf/Hybrid  |           | 10     |               |           | 27     |              |           | 7      |              |
| Other Wild   |           | 22     |               |           | 28     |              |           | 9      |              |

animal bite procedures, the ORV program, and links to other rabies sites were developed. The site includes interactive maps on animal bites and rabies statistics that can be searched by year and county. This should serve as a ready reference for most questions on rabies and other zoonotic diseases. Rabies maps were updated as animal rabies cases were reported. Other updates were added as material was prepared or program changes occurred. In addition, the Rabies Treatment Algorithm, completed in 2000, was sent to hospital emergency rooms and infection control practitioners throughout the state.

Table 2. Summary of rabies cases in Ohio from 1980 to 2001.

trapping. They collected approximately 600 serum specimens. Results are pending from CDC. The USDA also initiated radio-telemetry studies.

Although it seemed Ohio would have another year with no raccoon rabies cases, this was not to be. In early November, a raccoon exhibiting odd behavior from Lowellville in Mahoning County tested rabies positive. The positive raccoon was found less than a mile from the Pennsylvania border and raised speculation about whether this was a raccoon wandering from Pennsylvania or resurgence of raccoon rabies in Ohio. Mahoning County health officials provided alerts to the media and surveillance was intensified, but few specimens were submitted as winter weather decreased raccoon movement.

In 2001, ODH continued to support local health department rabies awareness/education and raccoon sur-

veillance. A total of \$264,000 was awarded in prevention grants to 12 counties. An additional \$90,000 in contracts was offered to 14 counties to help cover the cost of collecting and decapitating raccoons for testing. Skunks and foxes were added as these animals also serve as good sentinels for raccoon rabies activity.

Overall, in the target 14 county area, raccoon surveillance increased from 735 in 2000 to 746 raccoons submitted in 2001. However, raccoon submissions from the four Ohio counties bordering Pennsylvania (Ashtabula, Trumbull, Mahoning, and Columbiana) decreased from 302 in 2000 to 261 in 2001. Submission of suspect raccoons for rabies testing remains the most effective surveillance tool to detect raccoon-strain rabies cases.

A new initiative in 2001 was to create a zoonoses section on the ODH website. Pages on rabies prevention,

*Courtesy of  
Ohio Department of Health*

## RABIES RESEARCH UNIT

Rabies Research and Development Unit  
Ontario Ministry of Natural Resources  
P.O. Box 4840  
Peterborough, ON K9J 8N8  
Canada

## THE RABIES REPORTER

Editor  
Charlie MacInnes  
Office phone: 705-755-2270  
Office fax: 705-755-2276  
Home office phone: 905-640-6832  
Home office Fax: 905-640-4317  
Email: macinnch@netrover.com  
or charlie.macinnnes@mnr.gov.on.ca

## PRODUCTION AND MAILING

Beverly Stevenson  
Office phone: 705-755-2272  
Email: beverly.stevenson@mnr.gov.on.ca

## Animal Rabies Report: October to December 2001

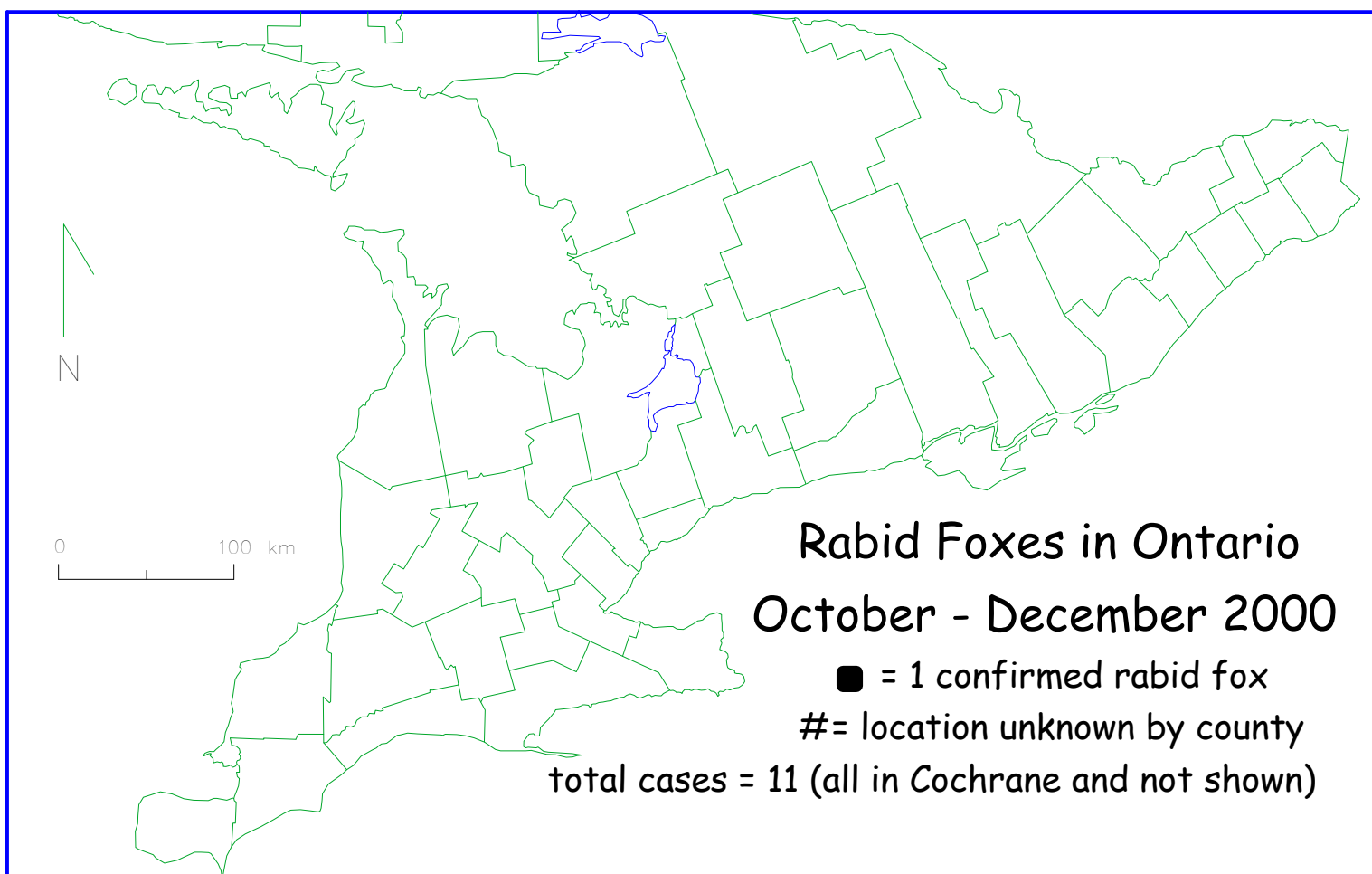
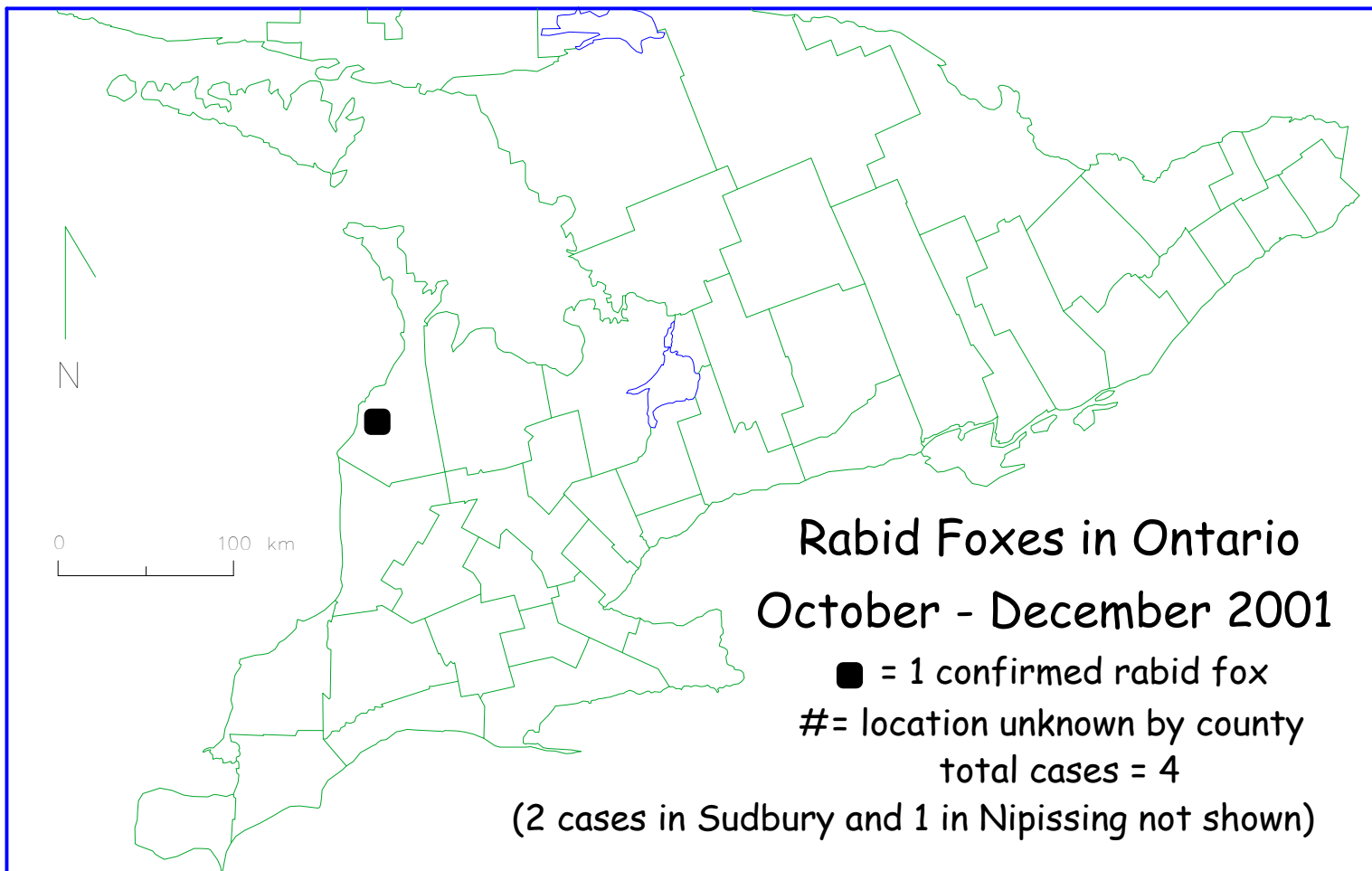
| Animal Type                  | Fox |            |    | Raccoon |            |    | Skunk |            |    | Other Wildlife |            |    | Bat |            |    | Dog |            |    | Cat |            |    | Livestock |            |    | Totals |            |    |
|------------------------------|-----|------------|----|---------|------------|----|-------|------------|----|----------------|------------|----|-----|------------|----|-----|------------|----|-----|------------|----|-----------|------------|----|--------|------------|----|
| County or Region             | #   | Cumulative |    | #       | Cumulative |    | #     | Cumulative |    | #              | Cumulative |    | #   | Cumulative |    | #   | Cumulative |    | #   | Cumulative |    | #         | Cumulative |    | #      | Cumulative |    |
|                              |     | 01         | 00 |         | 01         | 00 |       | 01         | 00 |                | 01         | 00 |     | 01         | 00 |     | 01         | 00 |     | 01         | 00 |           | 01         | 00 |        |            |    |
| Eastern                      |     |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            |    |        |            |    |
| Stormont, Dundas & Glengarry |     |            |    |         |            |    |       |            |    |                |            |    |     | 1          | 1  |     |            |    |     |            |    |           |            |    | 0      | 1          | 1  |
| Prescott                     |     |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            |    | 0      | 0          | 0  |
| Russell                      |     |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            |    | 0      | 0          | 0  |
| Ottawa-Carleton              |     |            |    |         |            |    |       |            |    |                |            |    |     | 5          | 8  |     |            |    |     |            |    |           |            |    | 0      | 5          | 8  |
| Renfrew                      |     |            |    |         |            |    |       |            |    |                |            |    |     | 1          |    |     |            |    |     |            |    |           |            |    | 0      | 1          | 0  |
| Lanark                       |     |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            |    | 0      | 0          | 0  |
| Leeds and Grenville          |     |            |    | 6       | 45         | 36 |       | 2          |    |                |            |    |     | 6          | 5  |     |            |    |     |            |    |           |            |    | 6      | 53         | 41 |
| Frontenac                    |     |            |    |         |            | 4  |       |            |    |                |            |    |     | 3          | 3  |     |            |    |     |            |    |           |            |    | 0      | 3          | 7  |
| Lennox & Addington           |     |            |    |         |            |    |       |            |    |                |            |    |     | 3          |    |     |            |    |     |            |    |           |            |    | 0      | 3          | 0  |
| Central                      |     |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            |    |        |            |    |
| Hastings                     |     |            |    |         |            |    |       |            |    |                |            |    |     |            | 2  |     |            |    |     |            |    |           |            |    | 0      | 0          | 2  |
| Prince Edward                |     |            |    |         |            |    |       |            |    |                |            |    |     | 1          |    |     |            |    |     |            |    |           |            |    | 0      | 1          | 0  |
| Northumberland               |     |            |    |         |            |    |       |            |    |                |            |    |     |            | 1  |     |            |    |     |            |    |           |            |    | 0      | 0          | 1  |
| Victoria                     |     |            |    |         |            |    |       |            | 1  |                |            |    |     | 1          |    |     |            |    |     |            |    |           |            |    | 0      | 1          | 1  |
| Haliburton                   |     |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            |    | 0      | 0          | 0  |
| Peterborough                 |     |            |    |         |            |    |       | 4          | 10 |                |            |    |     | 2          |    |     |            |    |     |            |    |           |            |    | 0      | 6          | 10 |
| Durham                       |     |            |    |         |            |    |       |            | 1  |                |            |    |     | 1          | 1  |     |            |    |     |            |    |           |            |    | 0      | 1          | 2  |
| York Region                  |     |            |    |         |            |    |       |            |    |                |            |    |     | 1          |    |     |            |    |     |            |    |           |            |    | 0      | 1          | 0  |
| Toronto                      |     |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            |    | 0      | 0          | 0  |
| Simcoe                       |     |            |    |         |            |    | 1     | 2          | 1  |                |            |    |     | 3          | 2  |     |            |    |     |            |    | 1         |            |    | 1      | 6          | 3  |

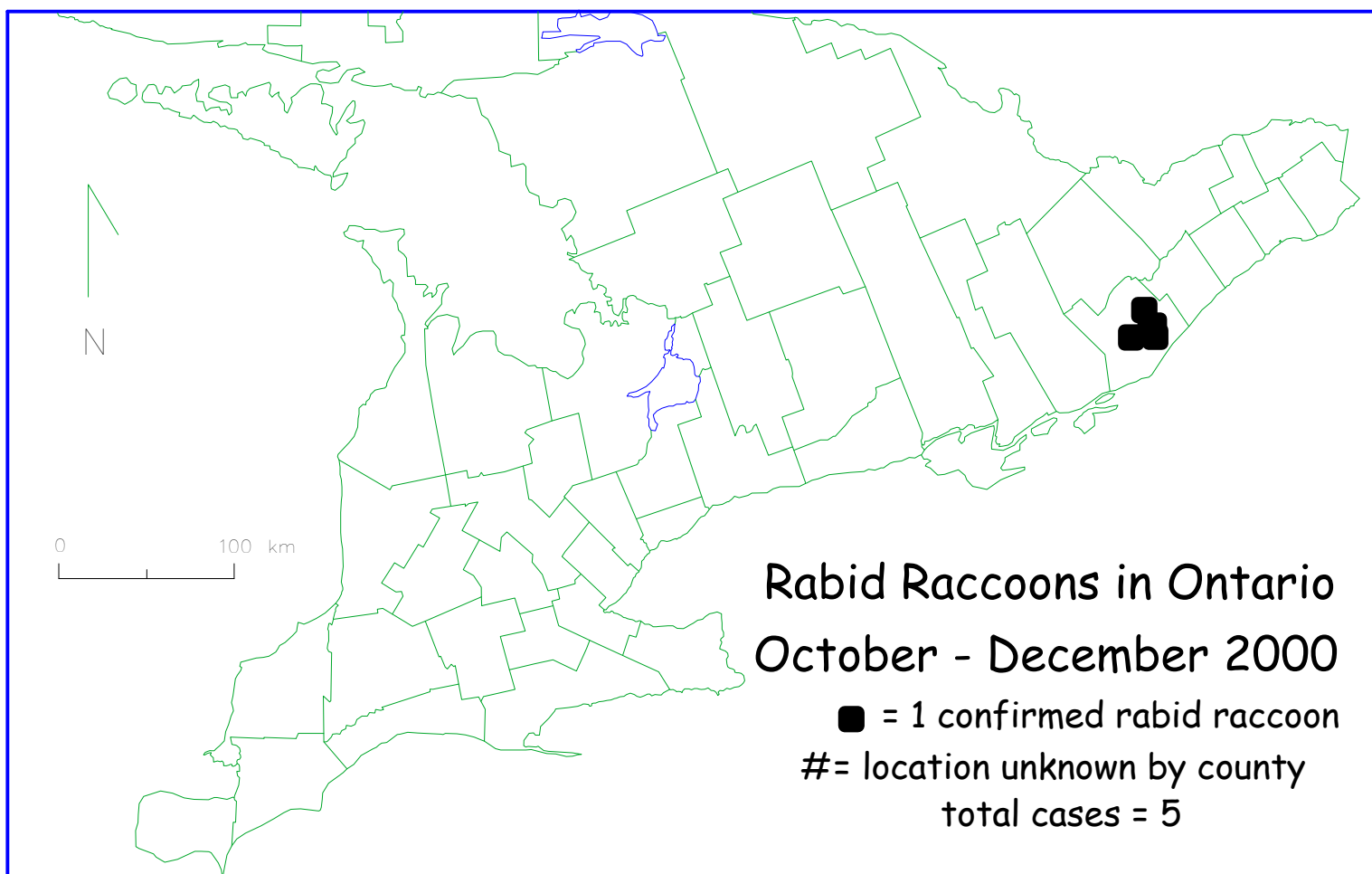
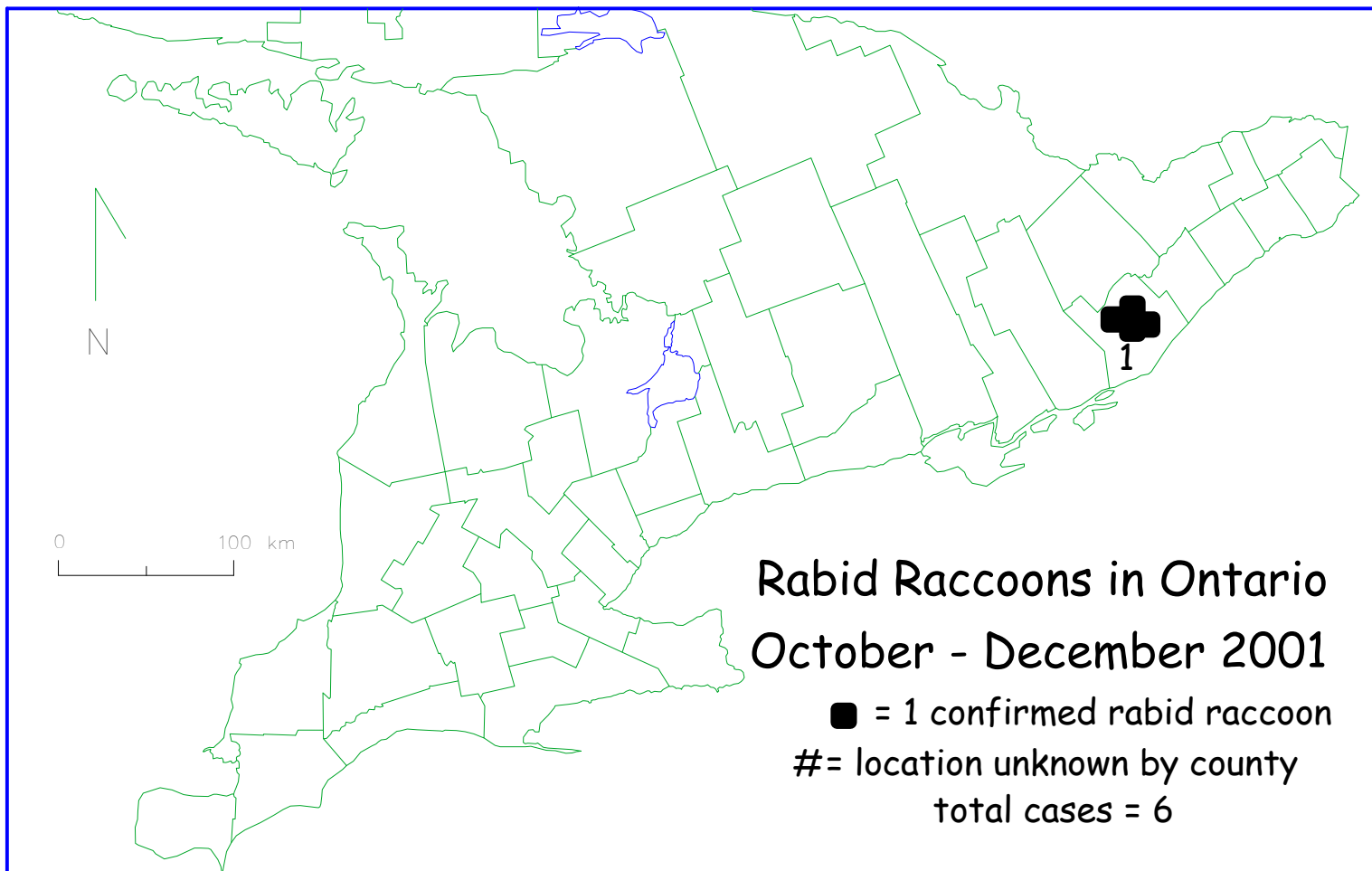
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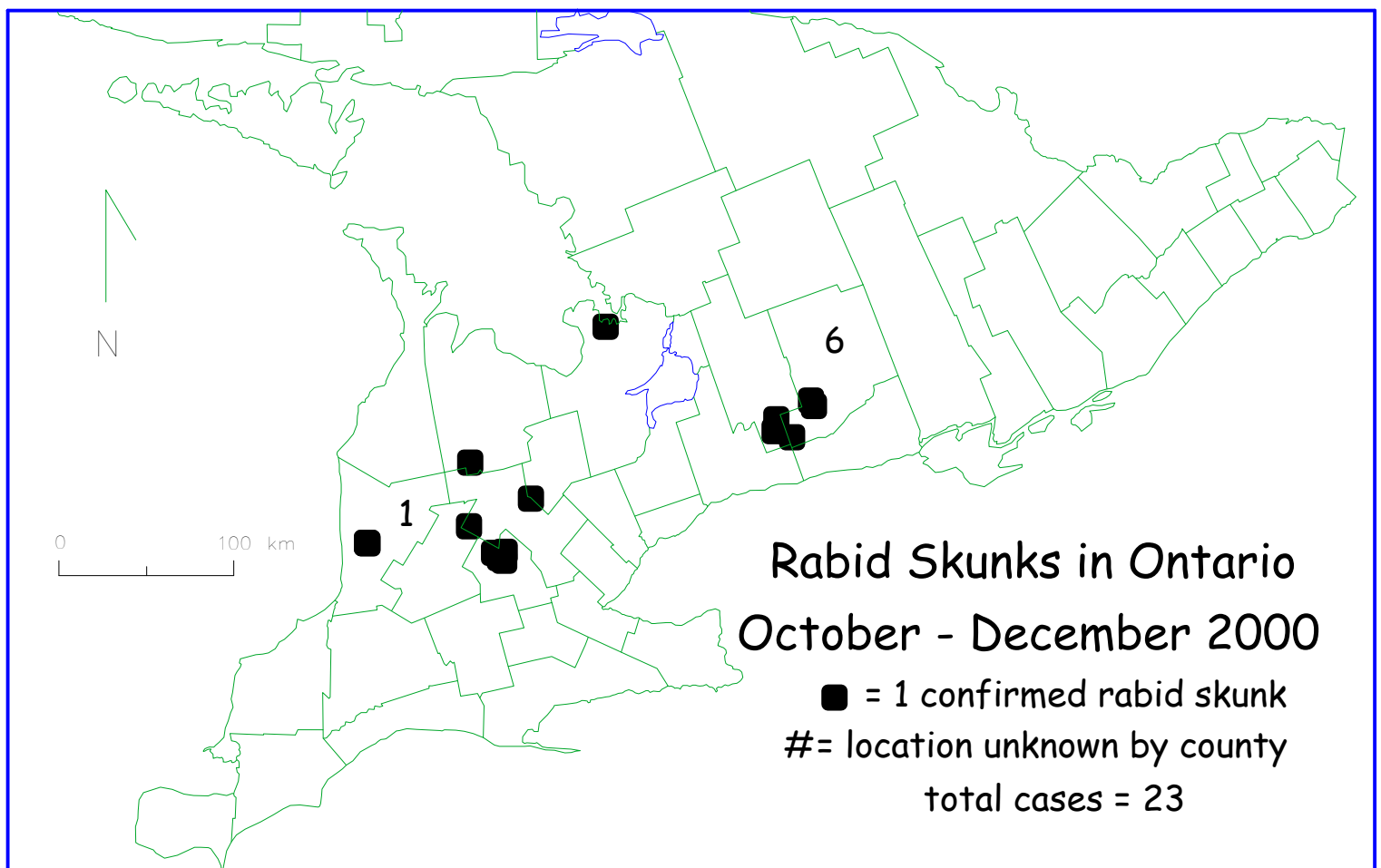
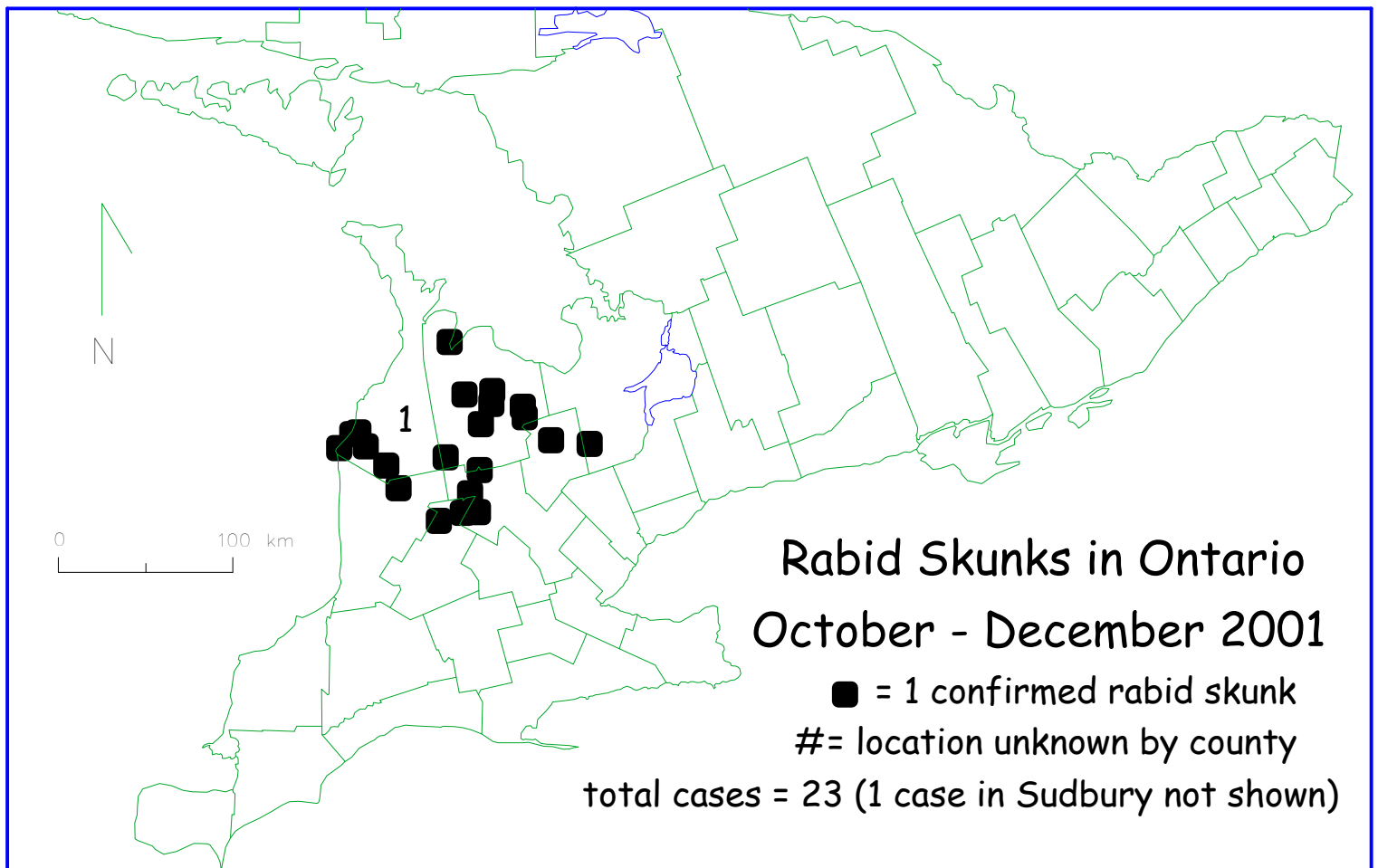


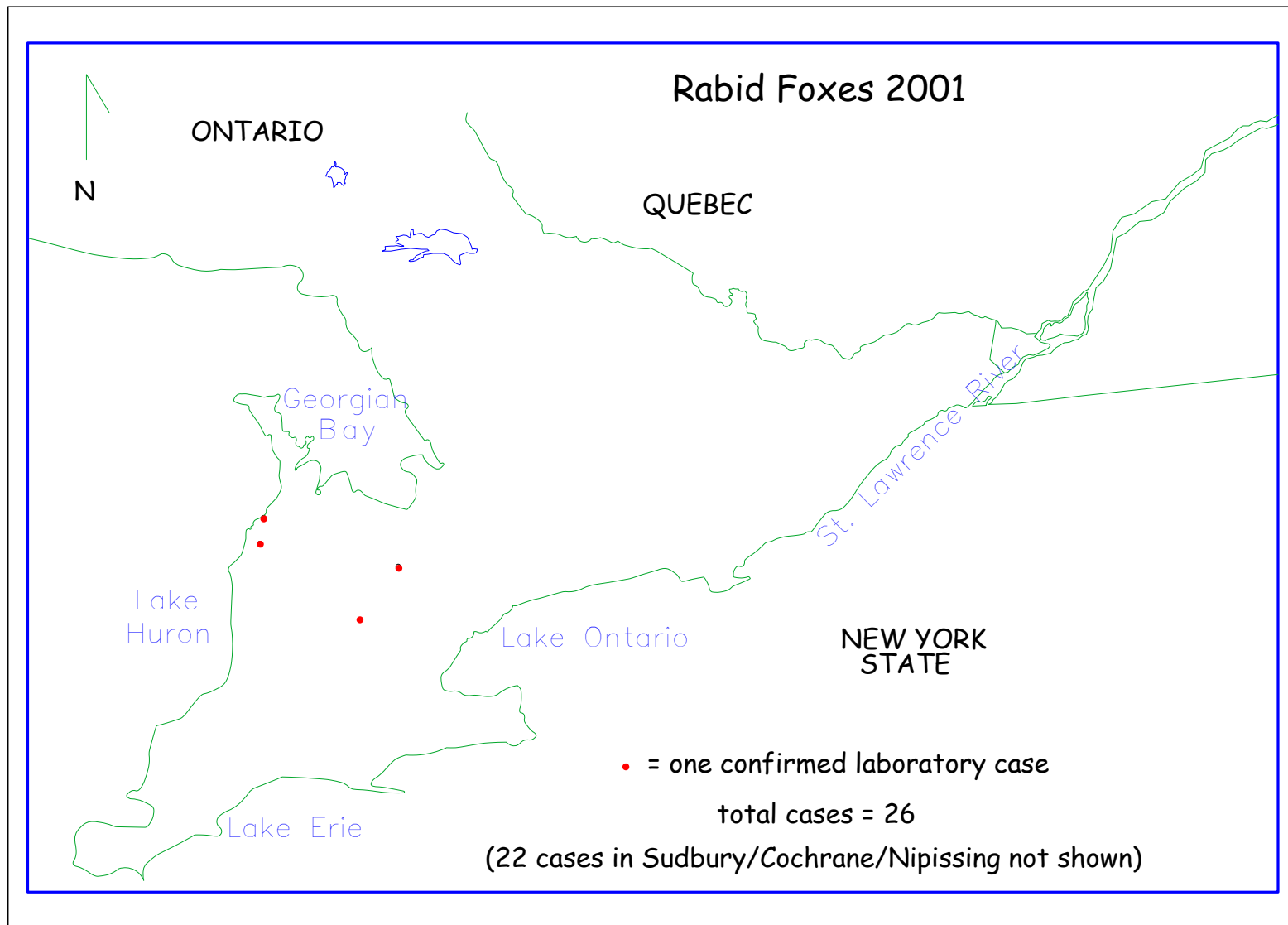
## Animal Rabies Report: October to December 2001

| Animal Type             | Fox                                                                                      |            |    | Raccoon |            |    | Skunk |            |    | Other Wildlife |            |    | Bat |            |    | Dog |            |    | Cat |            |    | Livestock |            |    | Totals |            |     |
|-------------------------|------------------------------------------------------------------------------------------|------------|----|---------|------------|----|-------|------------|----|----------------|------------|----|-----|------------|----|-----|------------|----|-----|------------|----|-----------|------------|----|--------|------------|-----|
| County or Region        | #                                                                                        | Cumulative |    | #       | Cumulative |    | #     | Cumulative |    | #              | Cumulative |    | #   | Cumulative |    | #   | Cumulative |    | #   | Cumulative |    | #         | Cumulative |    | #      | Cumulative |     |
|                         |                                                                                          | 01         | 00 |         | 01         | 00 |       | 01         | 00 |                | 01         | 00 |     | 01         | 00 |     | 01         | 00 |     | 01         | 00 |           | 01         | 00 |        |            |     |
| Northern                |                                                                                          |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            |    |        |            |     |
| Muskoka                 |                                                                                          |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            | 0  | 0      | 0          |     |
| Parry Sound             |                                                                                          |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            | 0  | 0      | 0          |     |
| Nipissing               | 1                                                                                        | 4          |    |         |            |    |       |            |    |                |            |    |     |            | 1  |     |            |    |     |            |    | 1         |            | 1  | 6      | 0          |     |
| Sudbury                 | 2                                                                                        | 16         |    |         |            |    | 1     | 2          |    |                |            |    |     |            |    |     |            | 1  |     |            |    |           |            | 3  | 19     | 0          |     |
| Cochrane                |                                                                                          | 2          | 25 |         |            |    |       |            | 1  |                | 2          | 2  |     |            |    |     | 1          | 5  |     |            |    |           | 3          | 5  | 0      | 8          | 38  |
| Timiskaming             |                                                                                          |            |    |         |            |    |       |            |    |                | 1          |    |     |            |    |     |            |    |     |            |    |           |            | 0  | 1      | 0          |     |
| Algoma                  |                                                                                          |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            | 0  | 0      | 0          |     |
| Thunder Bay             |                                                                                          |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            | 1  | 1         |            | 1  | 1      | 0          |     |
| Rainy River             |                                                                                          |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            | 0  | 0      | 0          |     |
| Kenora                  |                                                                                          |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            | 0  | 0      | 0          |     |
| Regional Totals         |                                                                                          |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            |    |        |            |     |
| Eastern                 |                                                                                          |            |    | 6       | 45         | 40 |       | 2          |    |                |            |    |     | 19         | 17 |     |            |    |     |            |    |           |            | 6  | 66     | 57         |     |
| Central                 |                                                                                          |            |    |         |            |    | 1     | 6          | 13 |                |            |    |     | 9          | 6  |     |            |    |     |            |    |           | 1          |    | 1      | 16         | 19  |
| Western                 | 1                                                                                        | 4          | 7  |         |            |    | 21    | 47         | 43 |                |            |    |     | 1          | 3  | 1   | 2          | 3  | 1   | 1          |    |           | 13         | 8  | 24     | 68         | 64  |
| Southern                |                                                                                          |            |    |         |            |    |       |            |    |                |            |    | 1   | 25         | 8  |     |            |    |     |            |    |           |            | 1  | 25     | 8          |     |
| Northern                | 3                                                                                        | 22         | 25 |         |            |    | 1     | 2          | 1  |                | 3          | 2  |     |            |    |     | 2          | 5  |     | 1          |    | 1         | 5          | 5  | 5      | 35         | 38  |
| TOTALS                  | 4                                                                                        | 26         | 32 | 6       | 45         | 40 | 23    | 57         | 57 | 0              | 3          | 2  | 1   | 54         | 34 | 1   | 4          | 8  | 1   | 2          | 0  | 1         | 19         | 13 | 37     | 210        | 186 |
| Notes for this quarter: | The bat in Kent County was a big brown bat.<br>The livestock in Thunder Bay was a horse. |            |    |         |            |    |       |            |    |                |            |    |     |            |    |     |            |    |     |            |    |           |            |    |        |            |     |



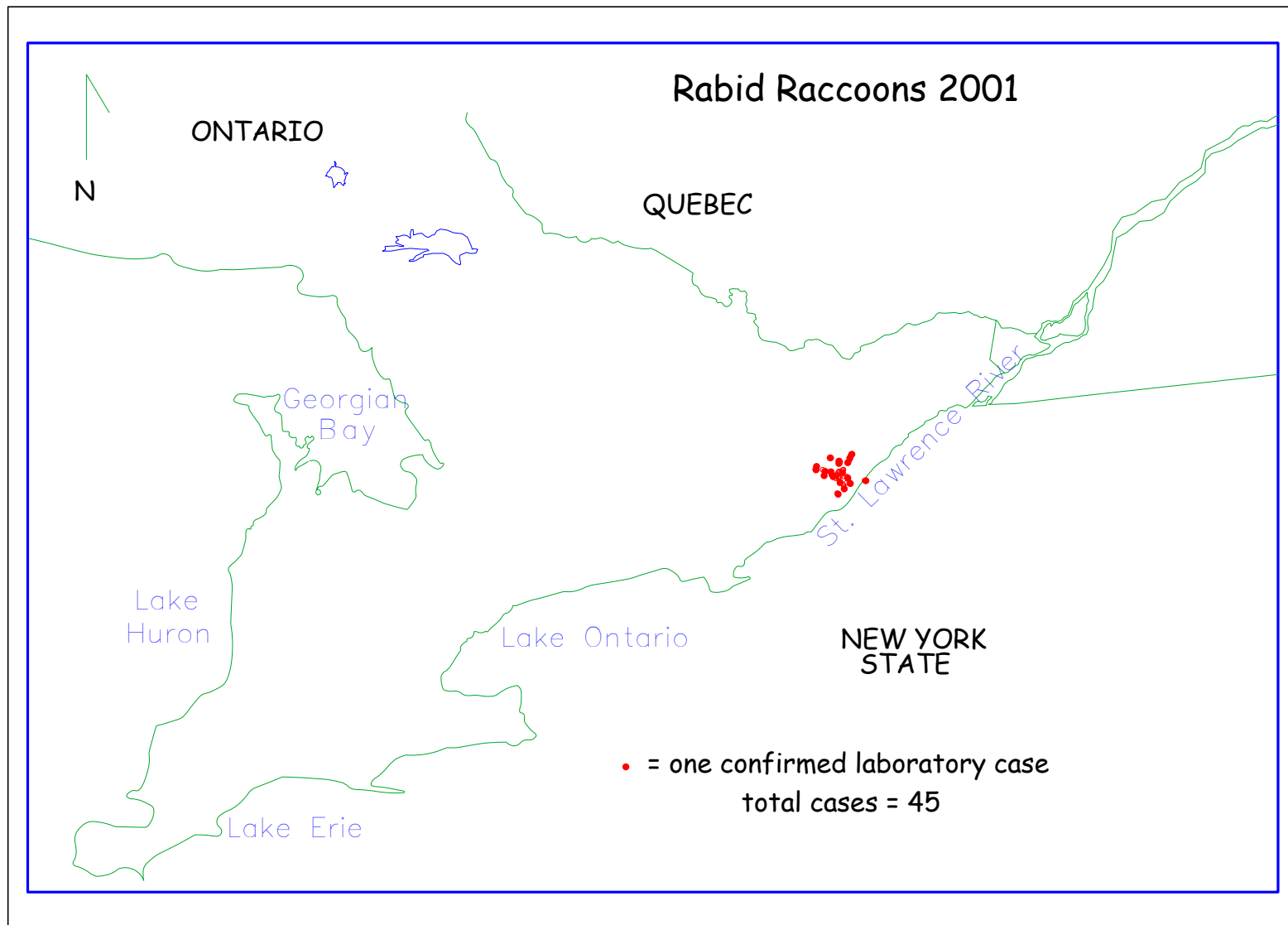






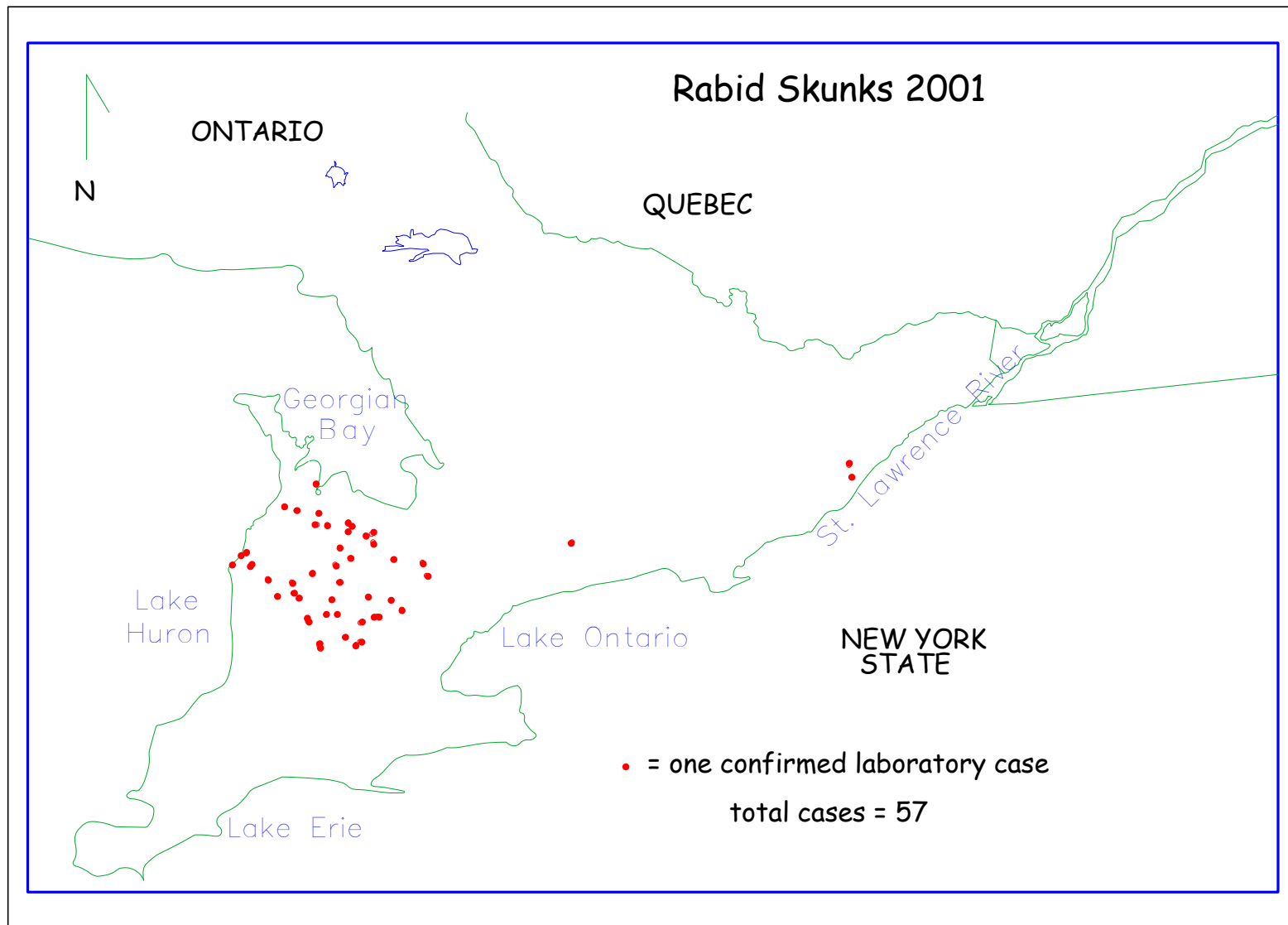
GIS Lab, Queen's University

Data Source: Animal Diseases Research Institute, Nepean, Ontario



GIS Lab, Queen's University

Data Source: Animal Diseases Research Institute, Nepean, Ontario



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Data Source: Animal Diseases Research Institute, Nepean, Ontario