

The Rabies Reporter

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RABIES SURVEILLANCE: WHAT A DIFFERENCE A STRAIN MAKES

On 12 August we got word that a raccoon from Arnprior was rabies positive. The point outbreak team were almost finished at Jellyby, and looking forward to going home. Next day the word came from Lindsey Elmgren at ADRI that this individual was not infected with the raccoon strain virus. It probably had a bat strain, but the specimen was so weakly infected that the ADRI rabies team were unable to culture the virus. (ADRI is the acronym for the Animal Diseases Research Institute in Nepean, near Ottawa. It is the major laboratory establishment of the Canadian Food Inspection Agency [CFIA] in eastern Canada). There was also a rabid skunk from the Arnprior area on 6 October, and, again, it was identified as having the eastern big brown bat variant of rabies.

There was a similar phone call on 21 October. A skunk taken in Delta was rabies positive. I had to call Rick Rosatte in from vacation, and the point outbreak team were put on alert. Next day Alex Wandeler phoned from ADRI to say that this individual was infected with the big brown bat strain. Rick went back to his seat in the sun, and everyone else exhaled, a great sigh of relief.

These cases caused much consternation in the rabies unit. Had they been raccoon strain, they would have represented unexpectedly extensive spread, as you can see from figure 1. That

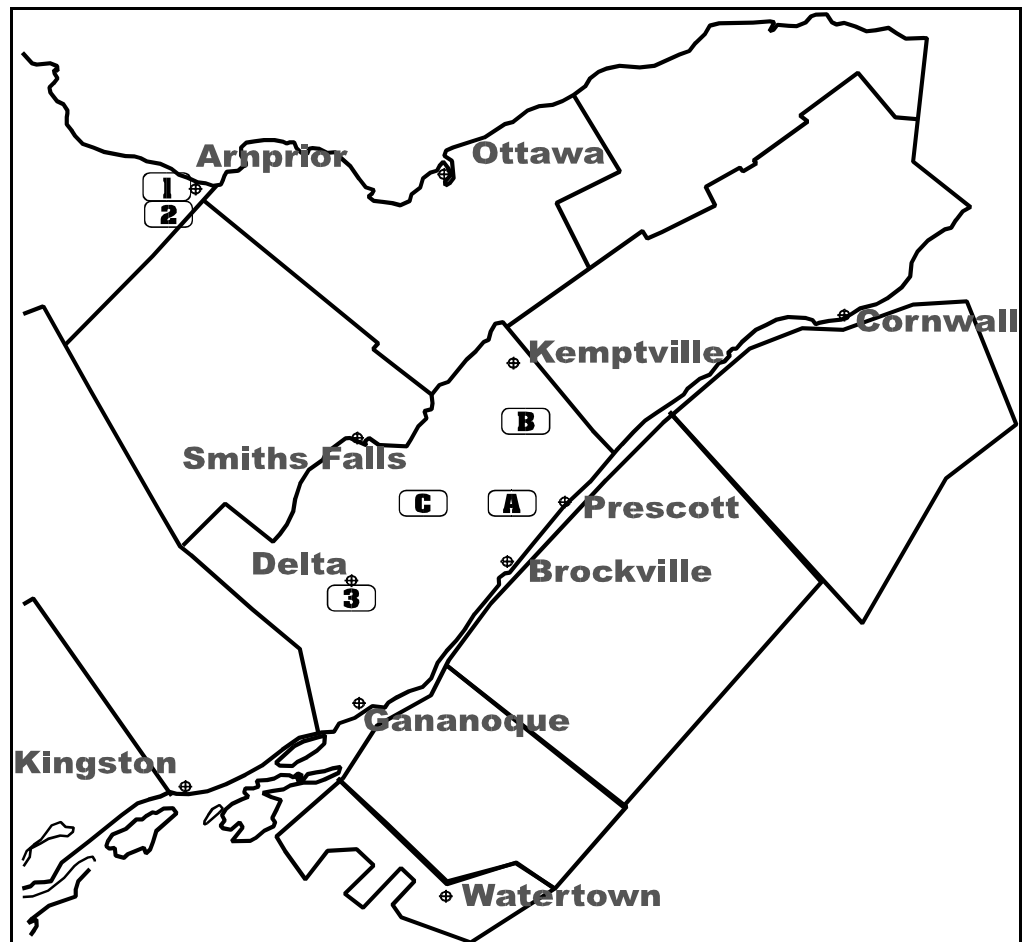


Figure 1. Eastern Ontario locations of raccoon strain and bat strain rabies cases in terrestrial mammals during the July-September quarter. Cases A (Maynard), B (Jellyby), and C (Oxford Station) were raccoons infected with raccoon strain. Cases 1 (Raccoon: Arnprior), 2 (Skunk: Arnprior), and 3 (Skunk: Delta) were infected with the variant normally found in big brown bats. The raccoon strain perhaps crossed into Ontario at or near the bridge from Ogdensburg, NY to Prescott. It is 50 km from Ottawa to Arnprior, 27 km between cases B and C, and about 35 km from case C to case 1.

would have indicated that our surveillance system was not working well at all. On the other hand, the fact that they were all bat variant suggests that the surveillance system is efficient and effective.

If you are to understand the last

paragraph, you must first understand how the whole surveillance system works. At the bottom end of the system is the rabies team at ADRI in Nepean. I have complete faith in this group. Their methods are



Part of the bait dropping team, on the last day of the September operation. Included are pilots, engineers, members of the rabies Unit, and two volunteers who drove from Texas to join the flights.

based on cutting edge science, and they best efforts to give us good reporting. have spent a lot of effort over the years. It is the front end of the verifying that their procedures are as good surveillance network in Ontario which as any in the world. The next stage raises my concern. How do rabid wild forward in the system is the network of animals come to the attention of the CFIA district offices, who are responsible network? A best guess in the 1980's, when the laboratory confirmed almost 2000 rabid animals from Ontario during an average year (out of roughly 8,000 - 12,000 submissions), was that somewhere between one in ten and one in a hundred of the wild animals which became rabid actually got sent to ADRI. The average rabid fox exhibits clear clinical evidence of rabies for about two days before it dies. If it is to become a reported rabies case, it must be seen by a human during those two days. It had to be more than seen actually: it had to expose a human or a domestic animal to rabies, and be killed, so that CFIA staff could collect the head and send it to be sent to the lab in New York than in Ottawa.

Texas, based purely on the likelihood that the higher rural population density (of humans) in New York means that the attention of the CFIA staff. The human or skunk in Texas is more likely to die domestic animal contact rule was a filter to without coming to anyone's attention. The set priority on specimens, and to keep total same comparison is likely true between submissions within reasonable limits. Ontario and Saskatchewan, despite CFIA's Now, it is essential to our efforts to

eliminate terrestrial variants of rabies that we map the last cases thoroughly. We need to hear about every last rabid animal, so we can plan the control efforts more precisely. It is within that context that I want to examine the surveillance network.

Surveillance for rabid wild animals is passive. That means that we wait for the rabid animal to be noticed by someone. There are no biologists, veterinarians or technicians actively scouring the countryside for rabid animals. That is a practical approach: the Rabies Unit has, over the years, collected a lot of fox carcasses from trappers, sometimes during rabies outbreaks. The normal prevalence of rabies among such specimens was 0.5 to 1%, and the highest ever observed was 4.5%. Due to the short period that individuals are rabid before they die, acting searching is unproductive. Over 700 raccoons were taken during the point outbreak control trapping: none was rabies positive. Perhaps the only example of a real active surveillance for rabies was carried out by Ward Stone of the New York Department of Environmental Conservation. When raccoon rabies came to Albany County NY in 1993, Ward and

a technician tried to find as many of the rabid animals as possible. The total of rabies cases for the year, from Albany County, including "normal" submissions concerned with human or animal exposure, was 832 (768 raccoons), nearly a third of all the rabies cases for the whole state for that year. I believe that they heard of many of their specimens from members of the public, but the public were sensitized by a very concentrated public information campaign. These totals were more than 10 times what was reported in any other county that year. The number of submissions was so large that it shows clearly on the graph of rabies cases for the whole USA!

Had the Delta skunk turned out to be infected with raccoon variant rabies, it would have meant that there were undetected rabid raccoons in the countryside across 30 km of landscape between Delta and the westernmost confirmed case at Jellyby. Since raccoon rabies traveled at about 40-60 km per year in New York State, this would also have indicated that raccoon rabies entered eastern Ontario in 1998, and passed undetected for the better part of a year. Even the spread among the actual three raccoon rabies cases is, nonetheless, large and worrisome. Clearly raccoon rabies has been in Ontario.

When raccoon rabies was confirmed in July, it generated a lot of publicity. Part of that sensitized the public, and gave them a clear idea of who to contact in their local area, if they saw a suspicious animal. We should expect the front end of the surveillance system to have been improved by that publicity. The fact that we have seen, in the past few months, almost as many terrestrial animals infected with bat rabies than in the whole previous decade says, strongly, that the publicity worked. There is more work to do. Parts of Lambton and Middlesex counties were not included in this fall's fox bait program. The Rabies Unit has received several letters and other communications from municipal offices, asking that the program be reinstated. Included in these are claims that there have

been at least two rabid foxes in Lambton County this summer. However, the ADRI records indicate that the last rabid animal in Lambton, other than bats, was in 1994. Does this indicate that actual rabies cases are still not reaching the laboratory?

There was an incident similar to the Delta case in London. A rabid skunk encountered on 1 September would have signaled a large advance of the skunk rabies front. It was a great relief to find that this animal was another bat-related case.

What happened this year? We have seen four cases of bat-variant rabies in terrestrial species. For the decade 1988-98 there were only five such cases, a gray squirrel, a skunk, a cow, and two foxes. Rabid bats have been at average or below average levels in 1999. More questions that answers here!

The summary of all this is that we have a good system for diagnosing rabies cases, but we need help from the public, and from all the professionals involved in the chain, to improve detection of the now rare rabies cases that still occur.

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MNR AND THE RABIES UNIT AT THE FUR MANAGERS CONVENTION

The Ontario Fur Managers Federation annual convention was held in Dorchester, near London, on 27 and 28 August. The Ministry of Natural Resources was represented by Aylmer District and the Rabies Research Unit. The Aylmer District display booth profiled the Fish and Wildlife Conservation Act and the importance of customer service, enhanced enforcement and better management and protection for wildlife that is the

cornerstone of new provincial legislation.

Conservation Officers, Technicians, Biologists and client services staff were all present to answer questions on the new Act and how it related to trapping, hunting and fishing in Ontario. This knowledge of our natural resources was complimented by having the fact sheets, hunting/fishing regulation summaries and other client service information on hand for distribution to the public.

The Rabies Research Unit was kept just as busy answering questions about the recent outbreak of raccoon rabies in eastern Ontario and the implications for the rest of Ontario. As well, the convention provided an excellent opportunity to profile the success with the aerial vaccination against rabies program. With over 1000 people in attendance, hunters, fishers and trappers had a great



Figure 1. That's OFMF stalwart, and the Rabies Unit's own, Kathryn MacDonald, caught with a silly grin on her face as she heads for the dunk tank. The tank was a successful fund raiser, and a popular attraction. The name of the successful hatchet thrower who tripped Kathryn's seat is withheld for his own protection!

opportunity to learn more about MNR. It is important to remember that Fur Managers (the '90's term for trappers) are good friends of the Rabies Unit. Since the mid 1970's they have been the backbone of our specimen collection network. We buy carcasses from active fur managers, rather than trying to catch the animals ourselves.

The enthusiastic participation by district and rabies research unit staff was evident throughout the convention. This included the cooking and serving of breakfast on Saturday morning, judging the trapper council booths and risking the dunk tank. In fact, the whole convention was in part a rabies unit production. Kathryn MacDonald, who does the logistics for the Rabies Unit, is herself a Fur Manager, and long-time member of the Federation and its predecessors. She was one of the inner team who made this convention happen.

There were over eighty booths which were put together by trapper councils, fur auction houses, trap suppliers, conservation organizations and businesses with everything for the outdoors person. If you have never been to one of these conventions, you will be amazed by the elaborate and informative nature of the Trappers' Council booths. Of course, many fur harvesters are also skilled taxidermists, and some Councils have resident artists, so the booths give a strong conservation message in a pleasant and educational way.

It was the first time that the convention was held in the southern Ontario. It was hosted by the Aylmer District Trapper's Council.

The convention attracted trappers from across Ontario. For many that attended the past conventions of the Federation, it was their first opportunity to see the importance of trapping in southern Ontario from a social, environmental and economic perspective.

There was something at the convention for everyone, both young and old. These activities ranged from games for the children to trap demonstrations, moose calling and a tomahawk throw. The banquet on Saturday night provided a great

conclusion to the two-day event. It was fun and informative for all listening to the speeches from the president of the Federation, Aylmer District Trapper's Council and the Canadian Outdoor Heritage Alliance.

The convention moves to a different location in the province each year. Next year it will be in Thunder Bay. MNR staff from that area can look forward to being the host community for a spectacular event.

MNR staff that manned the booths included Mark Emery, Pud Hunter, Ann Voegtler, Judy Case, Daryl Smith and Jim Greenwood (Aylmer District office) and Bev Stevenson, Andrew Silver, Kim Bennett, Kathryn MacDonald and Barry Radford (Rabies Research Unit). Senior MNR staff were also on hand to meet with the trappers at the convention and included Dick Hunter, Cam Mack and Chris Heydon.

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Senior Fish and Wildlife
Technician
Aylmer District
and
Bev Stevenson
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1999 BAIT DROPS 2.3 MILLION BAITS DROPPED IN 3 WEEKS A RECORD

The sign on the Rabies Unit wall now reads "over 26 million served".

This year's bait season was fast and concentrated. We dropped 2.3 million baits, in four jurisdictions, in just 3 weeks. And, thanks to cooperation from the weather' we even had some days off.

8 September 1999

Three planes came down from Sudbury, picked up staff and equipment in Peterborough, and flew on to Brockville and Ogdensburg NY. The Honorable John

Snobolen, Minister of Natural Resources flew in to Brockville, and launched the program. He certainly made an impression on the Rabies team, both as a very personable and sincere individual, and as a staunch supporter of efforts to combat raccoon rabies. By the time the media interviews were over, the ceiling had picked up, and we were off to drop raccoon baits. The flights went well. We put a 10-km-wide band of baits around the zone where the two point outbreak control operations had taken place. One half of this band was made of Fishmeal Polymer (FP) baits, the standard bait used in the USA, while the other half received the new green Ontario Slim bait.

While OPG and OPI were doing the Brockville flights, OGB went straight to Ogdensburg. The crew set up the radio equipment for flight watch, then dropped one lot of the experimental Linhart sachet baits. OPI and OPG joined them in Ogdensburg in the evening. Next morning we began an intense but normal operation. The support provided by the St. Lawrence County Health Department was excellent, well organized, on time, and great food!

The tactics along the St. Lawrence centered on dealing directly with the rabies outbreak that was the source of the Ontario cases. We had hoped also to do a large-scale comparison of the FP and OS baits, but the logistics prevented us from getting OS baits in time. There were Linhart sachets (LS) baits dropped on the same plots as in 1998. The FP baits are now all one standard size, as short as they are wide, where they used to be oblong. The whole St. Lawrence operation was wrapped up by noon on Saturday (11th), so we had a day off on Sunday.

Monday we were off to Niagara Falls for four flights plus one short trip over Grand Island. After this the Rabies Unit crew, except Kim Bennett and Andrew Silver, went home for the week, while the planes went on to Ohio. They were done there on Thursday and came in to Stratford, where the crew for the Ontario baiting gathered on Sunday, and started flying on Monday.

The Stratford operation went smoothly. The weather on Monday was mediocre, as a cold front moved through, but each aircraft got in four flights.

Tuesday OGB headed for Bromont, Quebec, to drop 84,000 raccoon baits, while the other two kept on in Stratford. The weather in Stratford as the OGB personnel headed to the airport was beautiful, clear and sunny, with ice on the car roofs and windshields at 0630, but not on the side or rear windows.

It was a shock to the OGB crew to encounter rain, and clouds right down to ground level, starting at Cornwall. Piloted by Frank Aquino and Jason Karas, they made it to Bromont on instruments, and were greeted on arrival by a major media event. There were at least five TV cameras, plus radio interviewers and newspaper photographers. Unfortunately, there was no flying on Tuesday: we could see the base, but not the peaks, of the Shefford Hills (elevation 1800 feet). As the Bromont Mountains (elevations up to 3200 feet) lay squarely across all the planned flight paths, there was no point in

taking off. Meanwhile the good flying conditions moved east as far as the Montreal area, and the prediction for Wednesday was that the front would move north and east across the baiting area during the night. Wednesday dawned rainy and foggy, and then the weather people acknowledged that the front had virtually stalled. Fortunately the airport in Bromont has a good restaurant, so we killed time in comfort. One of the Quebec biologists took several rabies unit crew out radio-tracking deer in the area. We finally got into the air on Thursday just before noon, and completed three of the four flights. The forecast for Friday was bad again, so we went to bed expecting another down day. However, Jason Karas woke early, and found the bad weather was late. For the rest of us the phone rang at 0515, and we were in the air for the last flight before 0700. We were back in Peterborough by early afternoon, not long after the other two planes arrived from Stratford. The country in Quebec had some of the best scenery I have seen on baiting flights. There were mountains,

lakes, ski hills, prosperous farms and lots of forest. Fall colours were just starting. I saw a pair of golden eagles flying near a cliff just south of Owl's Head, about 10 km north of the Vermont border. Everyone saw deer as we drove to and from the airport: there is a great abundance of white-tails in the area, despite considerable hunting pressure.

Back in Stratford, flying went exceptionally well, and the last flights were completed in Friday morning. Considering they were one plane short, this was a great achievement. Well done, pilots and Rabies Unit, supported by the engineers, and the always helpful Stratford Airport staff, plus Josie the caterer!

Peterborough baiting was done on Saturday, Sunday and Monday. It seems strange to report the dropping of roughly a million baits as routine, but the system worked as designed, and everything got done quickly

Tuesday 28 September. The three planes were due to leave for Quebec at 0630, and we were all out at the airport in time. However, there was a thick ground

RABIES BAITS DROPPED BY MINISTRY OF NATURAL RESOURCES AIRCRAFT

Year	Ontario	Quebec	New York	Texas	Vermont	Ohio	Total
1989	285,010						285,010
1990	744,088						744,088
1991	674,126						674,126
1992	687,001						687,001
1993	699,385						699,385
1994	1,485,000						1,485,000
1995	1,629,092	148,000	159,379	830,000			2,766,471
1996	1,280,289		343,507	2,565,253			4,189,049
1997	1,230,840	67,075	347,032	2,549,040	71,640		4,265,627
1998	965,796	118,404	396,312	2,663,000	114,800	576,720	4,835,032
1999	1,009,096	211,392	615,383	2,755,000	186,239	1,215,768	5,992,878
TOTAL	10,689,723	544,871	1,861,613	11,362,293	372,679	1,792,488	26,623,667

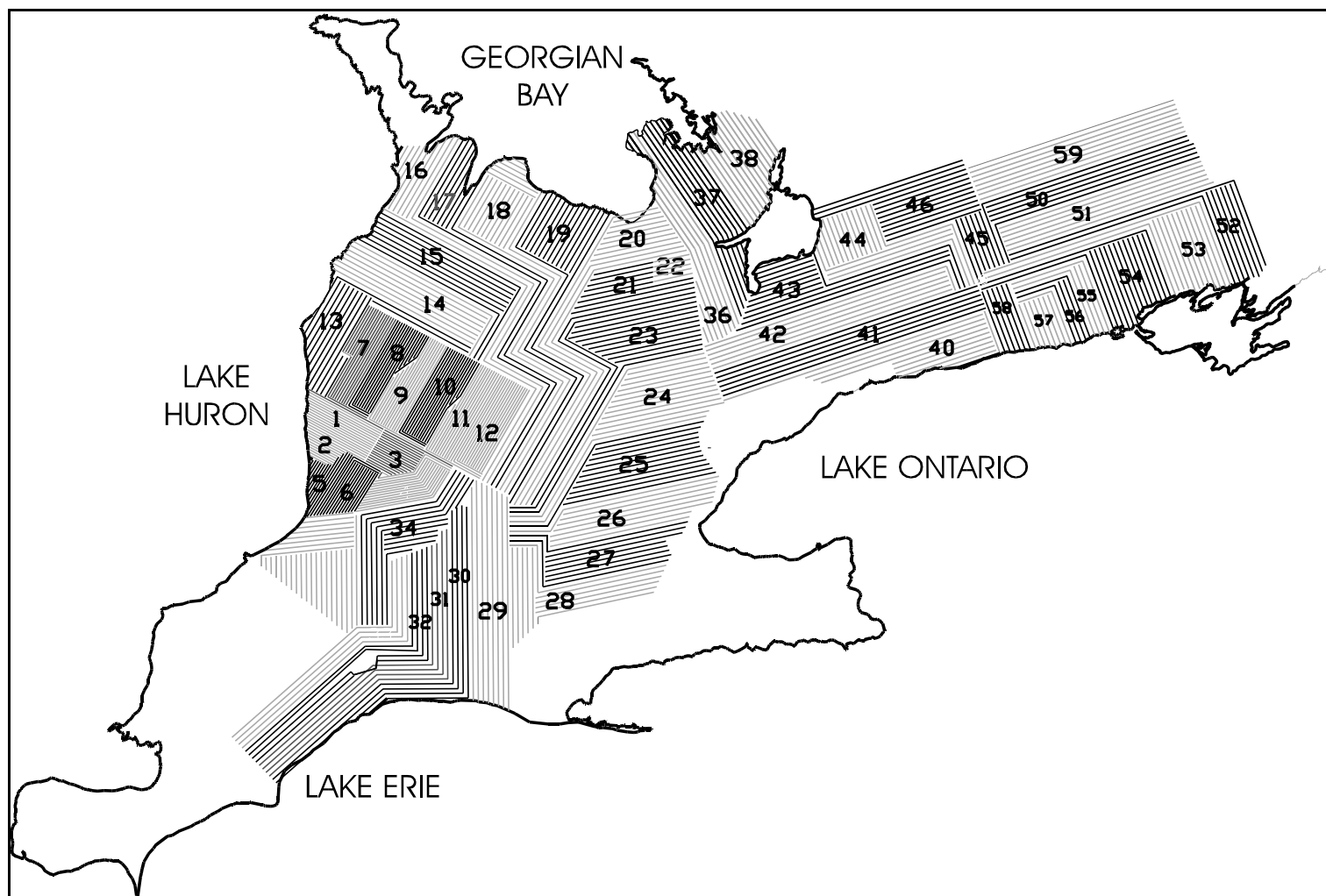


Figure 1. Flights and flight lines for fox baits in southern Ontario, September 1999.

fog swirling around, and we sat and waited until 0800. We could often see blue sky, but we could not see the runway. Once we got to St. Jean, Quebec, everything went smoothly. Michel Pigeon of MEF had a keen group of volunteers. The majority of these volunteers were from a wildlife management course at the CGEP in Sherbrooke. They were keen and enterprising! Andre Dicaire arranged the lunches, which were just right! The airport had enough fuel this year. Once the sun warmed up, it was an exceptionally fine day.

There were only a few media this time, but one pair were especially interesting: they worked on a children and teenagers' program on TV, they were well briefed, and asked intelligent questions.

The first flights were difficult, as there

was a strong haze, especially along the St. Lawrence. Bob Beaulac and I cut two lines short up near Sorel, because the visibility was terrible. There was a large power plant, with tall towers to get the transmission lines across the river (and the St. Lawrence Seaway), showing dimly, and sporadically, through the haze. Thank heavens for the Arnav navigation system, because there were times when it was hard to tell, in that very flat valley, exactly where we were. These lines also went across Mount Bruno, so we had a wonderful view of the mountain as we skirted across its flanks.

The seven flights were done by late afternoon, and the Ontario team made it back to Peterborough for dinner.

After the Quebec operation, there were only a couple of supplemental flights to do, plus clean up the aircraft to send

them home.

There were fewer calls from members of the public who found baits this year. It is too soon to say why, but the green baits are clearly not easily seen. One unfortunate dog became quite sick. This was a Great Pyrenees who has free range over 90 acres. He threw up three blister-packs, so he had obviously found several baits. At last check, he was recovering quickly.

I want personally to thank the whole team. Everyone worked long and hard, and stayed cheerful doing it! The Rabies Unit annually hires extra help, and there were a lot of familiar faces on the crew. The new hands learned quickly. Among the pilots there were several old friends, led, of course, by Neil Ayers. We also welcomed three pilots who were new to baiting - Bob Beaulac, Ray Fread and John

Gibson. Frank Aquino had, I believe, gone to Texas early in the year, but he was new to southern Ontario. Jason Karas, new last year, is now an old hand and expert on using the Arnav navigation system for bait flights.

Special thanks go to the maintenance team for keeping the aircraft in service. First they had to scramble to get two planes converted from floats earlier than planned. We did more flying than originally expected, which meant that scheduled major maintenance checks needed to be planned carefully. We got

the job done, and I expect two planes were in pieces on hanger floors within two days of getting "home". In total, the three planes logged 292.3 hours in the air in three weeks!

On the last day we said farewell to a true friend. Berj Sailian is leaving MNR, to join his wife who is now working in the USA. Berj has contributed a great deal to the installation of bait machines in the aircraft, and to making the whole system work. He designed better seats for the crew loading the machines, and a proper cargo pallet to hold the tubs of baits. He

and Andrew Silver, and Mike Pedde before Andrew, have made endless modifications and adjustments to get the machines to handle a variety of baits smoothly and at the correct rate. He has been the Rabies Unit's major contact with the engineering staff. We also missed another old friend: Eldon "Papa Smurf" Germain retired last April, and so was not one of our pilots this fall. The distaff side of the crew say that life will never be the same!! Eldon was a good pilot, and a good friend to all of us.

By the end of the period it was clear that

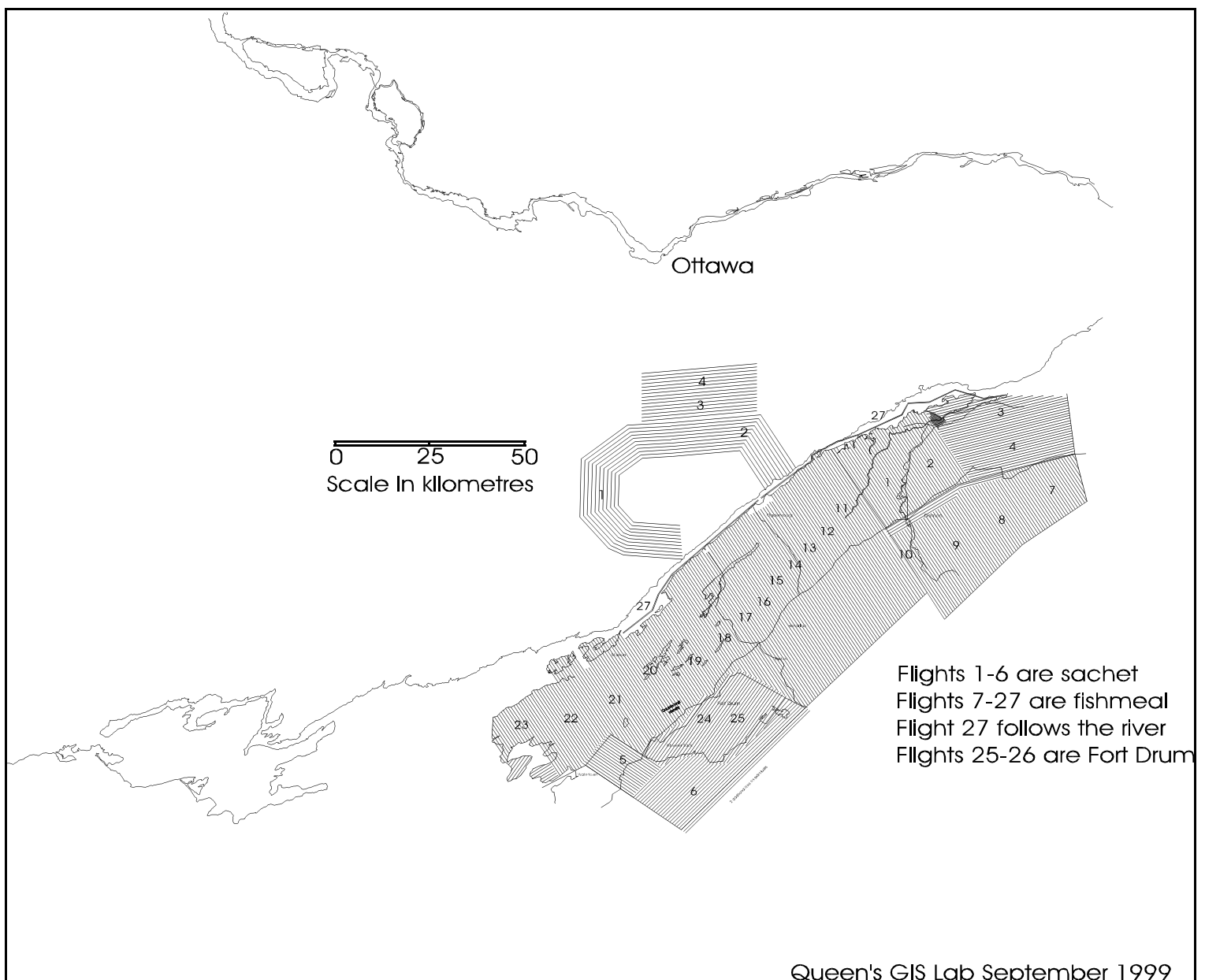


Figure 2. Flight lines for dropping raccoon baits in eastern Ontario and New York, September 1999.

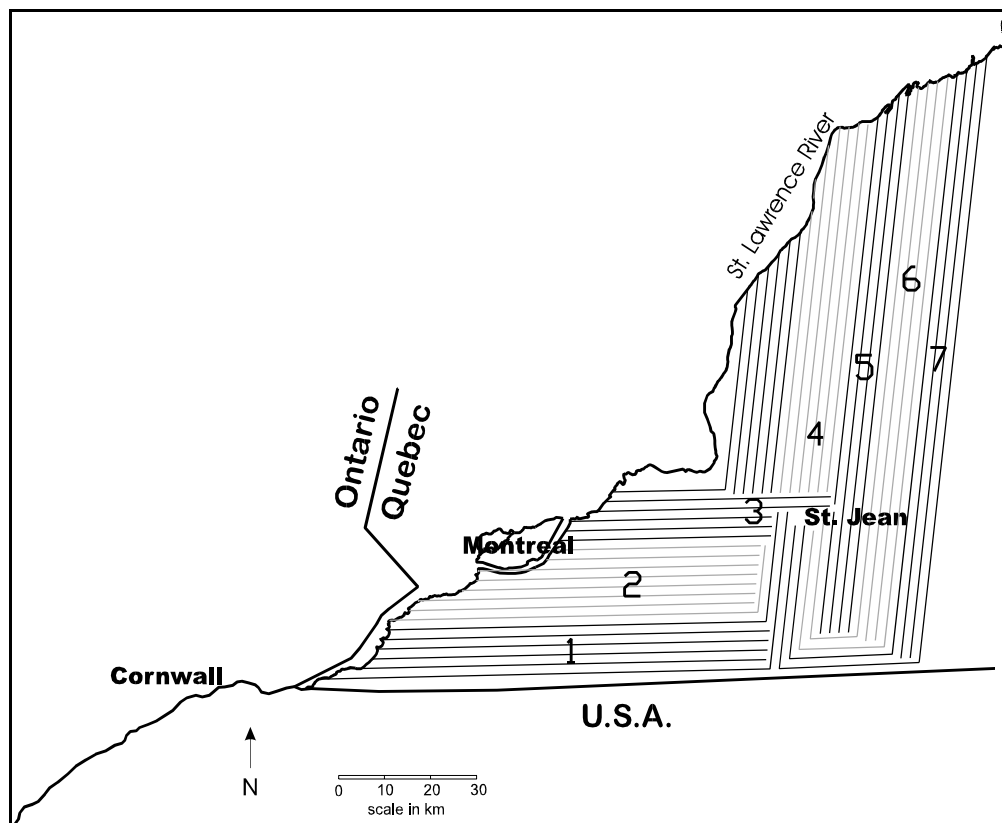


Figure 3. Flight lines for fox baits in Quebec, 1999. Flight base was St. Jean.

we had dropped more baits in less time than ever before. In the operation described above we dropped 2,298,893 baits in exactly three weeks, including days off. We have dropped more baits than this during Texas operations, but those operations normally lasted five weeks instead of three.

We dropped five different baits: the Fishmeal Polymer, the Linhart Sachet, and three variations of the Ontario bait. The Ontario baits started with the standard vanilla-sugar bait. There was concern from the public last year that this looked too much like white chocolate, so this year we added a dirty khaki colour. Then there was the new Ontario Slim bait, in khaki. It is a tribute to Andrew Silver, Berj and associates that we were able to change from bait to bait and still achieve a record for baits dropped in a short time. The bait machines have to be changed and adjusted for each different bait.

Special thanks are due to Laura Bigler of Cornell for arranging, on very short notice, the purchase and delivery of all the FP raccoon baits. Not only did she buy

them, they arrived on time at each airport where they were used. Michel Pigeon had an interesting trip to Ogdensburg, to pick up the baits that were to be dropped out of Bromont.

It was a busy but productive bait season in 1999. May future operations flow as well!

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THE 1999 BAIT DROPS WHERE, WHAT, WHY

This year's operations in Ontario, New York and Quebec were all parts of the overall plan to (1) eliminate the arctic fox strain of rabies from southern Ontario, and (2) to keep the raccoon strain out of Canada, including Quebec as well as Ontario. Of course, to achieve the second goal we must first get rid of the raccoon rabies which came into the province this summer. In the case of the arctic fox

strain, most of the action was in Ontario itself. Figure 1 shows the overall flight plans for that. However, there were some experiments built in. During the past year, Artemis Technologies, our bait manufacturer created a major change in bait production, by changing over to a bait developed by Ken Lawson, termed the Ontario Slim(OS). Where our normal bait (Ontario Regular = OR) has the blister-pack completely embedded in the fat mixture, the OS bait has the lid of the blister pack at the surface. The OR bait requires more manufacturing steps, and has two labels, one at the surface, the other on the blister-pack lid. In the OS bait, the plastic from which the blister-pack is made is "flocked", which means that it has fibre glued to the surface. That makes the fat mixture adhere to the plastic, and allows the slimmer bait to be made. The label is entirely on the blister lid. For the OR bait, first a label was dropped face down in the mold, then the molten fat mixture was poured in, the blister (full of vaccine was dropped onto the fat, and pushed under. For the OS bait, the blister is dropped face down in the mold, then the melted fat is poured in on top of it. This results in a slimmer bait, which we hope can be chewed more successfully by younger raccoons. There are other big advantages during the air dropping of OS baits. When the blister is pushed down as OR bait are made, melted wax is forced up the side of the mold, and leaves a rim, or meniscus. That meniscus breaks off easily, and is responsible for a lot of fat build-up on the bait machine in the aircraft. There is no comparable step during manufacture of the OS bait, so no meniscus, and much cleaner bait machines! Secondly, the slimmer baits weigh less, and more fit into the tubs and trays used in the airplane. There were nearly 30% more baits per tub with the OS version.

Another change instituted this year was to colour the baits. The original sugar-vanilla-fat baits were off-white in colour, which prompted concern among parents that they looked too much like white chocolate. So we needed a "repulsive" colour. If you scan the candy

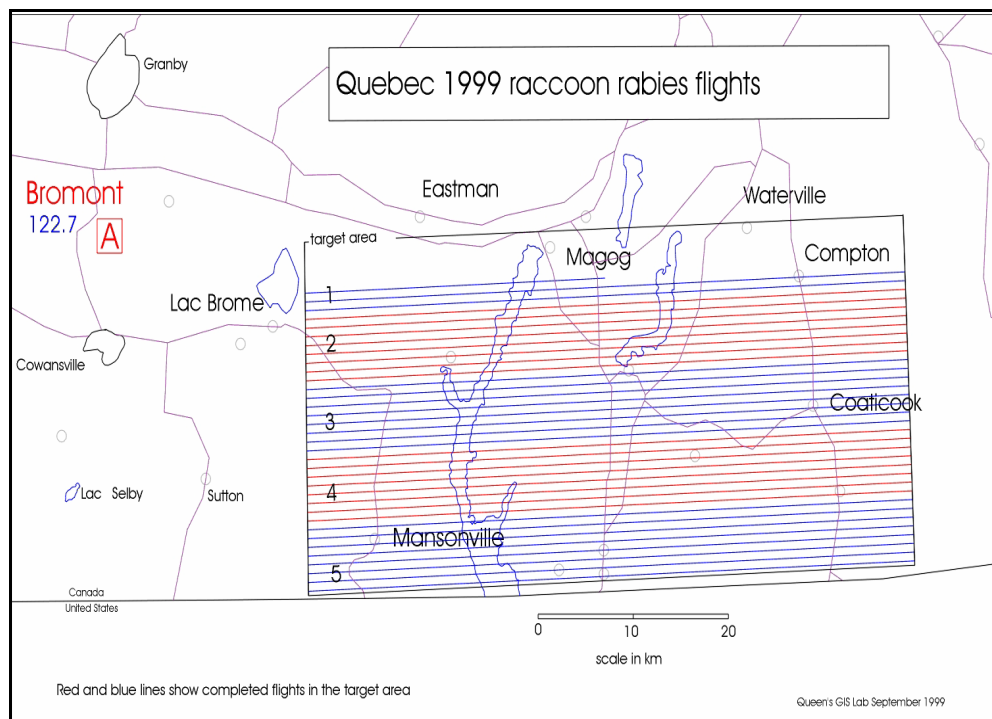


Figure 4. Flight lines for raccoon baits in southern Quebec

shelves in a bulk food store, you will quickly discover that candies come in almost every colour imaginable. Our compromise was a dark khaki green, which looked dirty, and had the added advantage of making the baits hard to see in vegetation. In what follows, “-W” denotes the original white baits, while “-G” is the symbol for the new green baits.

The Rabies Unit is a cautious and thorough group. We insisted on testing these new baits against each other. The overall fox area was split into three, and OR-W, OR-G and OS-G baits were put on large test plots. In addition, to gauge the acceptance by raccoons, the test area covered by flights 1 - 12 (Figure 1) was baited at 60 baits/km², along flight lines 1 km apart, instead of the normal 2 km line spacing, and 20 baits/km² used for foxes.

During the period 1990-97, there was still Arctic fox strain rabies in Quebec. In 1995 we baited a strip of the Ottawa Valley on the Quebec side, but in 1997 we started to worry about re-invasion by the fox rabies which was persisting in the Richelieu Valley, just east of Montreal. This year we covered the area, shown in figure 3, starting from a line 30 km east of the Richelieu River, and covering the

triangle bounded by that line, the St. Lawrence River, and the US border.

The most intricate set of flights were those directed against raccoon rabies along the St. Lawrence River. First there were the flights in Ontario. On 8 September we laid down a belt of baits 10 km wide around the outside of the point outbreak zones centered on the first two cases of raccoon rabies. This also included a comparison of OS baits with FP from the USA (Figure 2, flights 1 and 2). The third raccoon strain case occurred on 17 September, so we went back on 26 September and put FP baits north of that location (Flights 3 and 4).

On the New York side of the St. Lawrence, the complex design shown on page 3 of the last issue of the Rabies Reporter could not be implemented, because we were unable to obtain sufficient bulk raccoon vaccine in time to get the OS baits made early enough for a drop. We are very reluctant to drop baits for raccoons after 30 September, and really prefer to drop before 15 September. However, Dr. Bigler did have enough Linhart Sachet (LS) baits to put on experimental plots at the eastern end of the bait zone shown in Figure 3.

Otherwise, the bait zone covers fully, and beyond to the east, the outbreak of raccoon rabies in St. Lawrence County, and it covers enough of Jefferson County to protect the whole Canadian border.

The southern boundary of the current bait zone is the 500 meter (Above Sea Level) contour. Nearly a decade of raccoon rabies has shown that it very rarely, at the latitude of New York State, penetrates above that level. There are enough cottagers, campers, fisherpersons, and naturalists in the Adirondacks during summer that if there were raccoon rabies there, someone would have encountered it. One case did occur south of the bait zone during the summer. It was in an isolated area of cottages, and Dr. Bigler is watching very carefully to see if there is any spread.

In future years we hope to be able to move the New York barrier of baits southward. Assuming the 500m upper limit proves to be safe, a block of baits at least 60 km wide stretching from Lake Ontario to the Tug Hill Plateau, a block in the Black River Valley, and another band from the east side of the Adirondacks to Lake Champlain would be the least amount of baiting needed to protect Ontario from further incursions of raccoon rabies. If we can develop cooperation with New York State, this barrier could go further south.

In the case of the Arctic fox strain of rabies, we determine the limits of the baited area by two rules: (1) We should bait at least 50 km beyond the most recent confirmed cases, and (2) we shall continue to bait for two years after the last case of this strain in an area. We have had two cases of fox strain in 1999, east of Toronto. Therefore, most or all of that area will have to be baited at least in 2000. Decisions about exactly where baits will go each September are made in July or August, with reference to the most recent rabies case locations. Experiments are factored in at that time.

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RABIES DURING THE THIRD QUARTER: WORRISOME BUT NOT CAUSE FOR PANIC

A quick look at the tables for the recent quarter would make a country paper's reporter cheer at a ready-made headline. On the surface, we have had two and a half times (250%) more rabid foxes to the end of September 1999 than we had in the whole of 1998. However, that really meant that cases were up from 4 to 10!! Now that rabies is scarce, it's easy to fall into the trap of small numbers making huge percents.

Actually, the overall picture is reasonably favorable. There were 13 rabid skunks in the quarter, of which 12 were in Waterloo-Wellington-Dufferin-Grey-Bruce-Perth, where rabies in skunks has been the major feature of all southern Ontario. Last year that region had 9 skunks in the third quarter. The single rabid skunk in London first seemed to be a big jump from the other skunk rabies outbreak, until we learned that it was infected with bat rabies.

All three of Ontario's (and Canada's) three cases of raccoon rabies occurred in this quarter. These are shown on the map on page 1. Two were reported in the last issue. The third occurred near Oxford Station on 17 September. It may be more interesting that a number of suspicious individuals turned out to be negative for rabies. Included in this group were two raccoons with porcupine quills in their faces, and a beaver which attacked a man. The gentleman, in his eighties, dispatched Canada's national animal with the handiest weapon, a hockey stick. How's that for the Canadian way, eh?

All of the rabid foxes were in the region close to the rabid skunks. I asked Peg Hauschildt at Queens to measure the distance from each fox case to the nearest three rabid skunks in the previous 6 months. The mean distances, in kilometers, for 8 foxes were 15.5 (range 1.2 - 29.1), 28.3 (range 17.4 - 45.8, and 35.8 (range 28.8 - 48.9). These are

extremely small distances, if you consider that the alternative is that rabid foxes occurred totally independently of rabid skunks. Did the skunks infect the foxes, or vice-versa? Well, the outbreak in skunks has been in the area for at least a year, and this number of foxes is the largest in the period. This is weak evidence, but it does support the idea that the skunks are capable of passing rabies back into the fox population. We have known for many years that skunks are the #2 species spreading the arctic fox strain of rabies in southern Ontario. We also believe that skunks are unable to maintain the strain indefinitely, without input from the fox population. The vaccine in current fox baits does not immunize skunks by mouth, so we have to wait while rabies in skunk populations "burns out", that is, that it dies out because the last rabid skunks do not meet other skunks to pass the disease to. That happened within a few months after the last rabid foxes in eastern Ontario. Looking at the older records, we also saw that the peaks and troughs in numbers of rabid skunks did not track the numbers of rabid foxes as closely in western Ontario as they did in the east. That suggested that rabies in skunks was not as directly related to the situation in foxes in western Ontario, and therefore, that rabies might persist longer in the skunk populations of western Ontario.

Three cows and one dog were the total domestic and companion cases for the period. It is still distressing, after all the efforts to get dogs vaccinated, to see direct evidence that there are still careless owners out there!

The third quarter is when most rabid bats are usually encountered. While that was true this year, the overall number of rabid bats was much lower than a year ago, largely due to there being no major incidents such as the wide publicity in Durham Region last year. I find it very interesting that there were a raccoon and a skunk with bat rabies found near Arnprior, yet there were no rabid bats reported from the area.

Overall, then, this quarter provided

few surprises, other than the three cases of bat rabies in terrestrial species, discussed in the lead article. I wish the decline in rabies had continued, but the increase encountered was modest.

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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, Ontario Ministry of Natural Resources; the Food Production and Inspection Branch, Canadian Food Inspection Agency; the Ontario Ministry of Health; and the Geographic Information Systems Laboratory of the Department of Geography, Queens University, Kingston. Articles for future issues will be welcomed by the editor. Comments, letters, submissions and inquiries should be sent to:

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From within the government firewall the address is:

[http://mnrweb.mnr.gov.on.ca/sird/ra
bies](http://mnrweb.mnr.gov.on.ca/sird/rabies)

Animal Rabies Report: July to September 1999

[illegible]

Animal Rabies Report: July to September 1999

[illegible]

Animal Rabies Report: April to June 1999

Animal Type	Fox			Raccoon			Skunk			Other Wildlife			Bat			Dog			Cat			Livestock			Totals		
County or Region	#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative	
		99	98		99	98		99	98		99	98		99	98		99	98		99	98		99	98		99	98
Northern																											
Muskoka																								0	0	0	
Parry Sound																								0	0	0	
Nipissing																								0	0	0	
Sudbury																								0	0	0	
Cochrane																								0	0	0	
Timiskaming																								0	0	0	
Algoma																								0	0	0	
Thunder Bay																								0	0	0	
Rainy River																								0	0	0	
Kenora																								0	0	0	
Regional Totals																											
Eastern				4	4								7	8	9										11	12	9
Central			1		1			1	2				3	4	10										3	6	13
Western	8	10	3				12	25	20				3	3	1	1	2	1			1	3	11	8	27	51	34
Southern							1	1							6										1	1	6
Northern																									0	0	0
TOTALS	8	10	4	4	5	0	13	27	22	0	0	0	13	15	26	1	2	1	0	0	1	3	11	8	42	70	62

Notes for this quarter:
The raccoon in Victoria County, Central region, was infected with the arctic fox variant. The raccoon in Renfrew County, Eastern Region, was infected with a bat variant, probably big brown bat. The other 3, in Leeds and Grenville, were infected by raccoon variant.
Among the rabid bats, 13 were big brown bats, 1(Wellington County) was a little brown bat.
The skunk in Middlesex County, Southern Region, was infected with a bat variant.

