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The rabies reporter

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Review of rabies in Ontario during 2010

Beverly Stevenson, Rabies Research and Development Unit, MNR

There were a grand total of 39 diagnosed rabies cases in Ontario during 2010.

This is the lowest number ever since rabies became established in Ontario over 50 years ago beating last year's record low of 50 by over 20%.

During the final quarter of 2010, there were five new cases including two skunks from Grey County and three bats from Haldimand, Peel, and Peterborough counties. This brings the yearly total to 10 skunks and 29 bats. Despite the arrival of white-nose syndrome in Ontario, the number of rabid bats is comparable to the previous year's total of 30.

Two bats from the Thunder Bay region were not reported in the previous issue of the Rabies Reporter but both occurred in July. Submissions from northwestern Ontario are sent to the CFIA laboratory in Lethbridge, Alberta for testing. Submissions from the rest of Ontario are sent to CFIA's Ottawa Laboratory Fallowfield (OLF) in Nepean, Ontario. Since MNR only deals with OLF, there can sometimes be delays in obtaining information on rabies cases in northwestern Ontario.

Although there was a slight increase in the number of rabid skunks from eight in 2009, this is not alarming. Ten rabid skunks for the entire year is still remarkable. This number may be even lower next year as a result of the high density management baiting which was done in response to each of the skunk cases. The two skunk cases in November occurred at opposite ends of Grey County - northwest of Owen Sound and northeast of Mount Forest. High density baiting was conducted in response to the Owen Sound area case. This case occurred between two other management plots so it had only received the standard 20 baits/km². The case near Mount Forest occurred in an area that had been previously been baited at high density so no additional baiting was required.

The biggest (and nicest) surprise in 2010 was that skunks and bats were the only species confirmed with rabies in Ontario. This is the first time in over 50 years that there were no confirmed rabies cases in pets or livestock. The lack of rabies cases in domestic animals is very encouraging. With wildlife, we expect that some animals will contract rabies and will die from it without ever encountering humans. It is estimated that only 10% of wildlife rabies cases make it to the lab for testing.¹ With domestic animals, however, due to the close interaction with humans, we expect that almost all rabies suspect domestic animals would be submitted for testing. Hopefully these trends continue for 2011 and wildlife rabies cases continue to decline and domestic animals stay rabies free.

¹ MacInnes, C. D., S. Smith, R. Tinline et al. 2001. Elimination of rabies from red foxes in eastern Ontario. *Journal of Wildlife Diseases* 7: 119-132.

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 Ottawa Laboratory (Fallowfield) of the Canadian Food Inspection Agency; and the Ontario Ministry of Health and Long-Term Care. Articles for future issues will be welcomed by the editor. The Rabies Reporter is not refereed, and should not be cited in papers intended for refereed journals. Send contributions, letters and inquiries to:

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Update on the 2010 ONRAB® live surveillance program

Val VonZuben, Rabies Research and Development Unit, MNR

The ONRAB® live surveillance program involves the design of an experimental plot to field-test the impact of a particular bait density and flight line spacing on a given terrestrial rabies vector species population. In 2010, 133,674 ONRAB® ultra-lite baits were aerially distributed (targeting skunks) during the week of September 13th to 18th over an experimental plot measuring 900km² that straddled Grey, Bruce, Huron and Wellington counties. During October 18th to 29th, five weeks after baiting, six trappers, over 4,028 trap nights captured a total of 162 skunks (119 captures and 43 recaptures).

Each trapper set 100 live traps baited with sardines at 50 sites throughout each of two 3km x 3km trapping cells. All live-trapped skunks were brought to a central field station where they were anaesthetized. Blood samples were extracted and animals were ear-tagged for identification, field aged and sexed, and reversed from the anaesthetic. After recovery, skunks were released at the point of capture. Sera was extracted from the blood samples and sent to the Canadian Food Inspection Agency diagnostics centre in Nepean, Ontario for determination of rabies antibody levels. Results of the serological analysis are pending.

If I had to describe the 2010 ONRAB® live surveillance program I would characterize it by a series of 'firsts'. 2010 was the first year we dropped baits at a density of 200 baits per square kilometre. Coupled with a flight line spacing of 0.25 kilometres, we have hopefully found the perfect balance between an immunized wildlife population and a cost-effective management strategy. 2010 was also the first year we scaled the project down to 8 staff, which is a far cry from the 46-strong workforce of nature that descended on Flesherton in the first two years of the project. Change is necessary for progress though and how can we 'develop' if we don't explore new frontiers? This was the first time that an ONRAB® experimental plot has been located near the quaint town of Hanover (Figure 1) and the first time our field station has been located at the picturesque Saugeen Valley Conservation Authority (SVCA) headquarters property. I'm sure it was also the last time SVCA staff would agree to play host to such a malodorous bunch.

Now I'd like to be able to say that our experimental approach involved strictly controlled variables but alas, Mother Nature surprised us and blanketed our traps with the fluffy white stuff for the first time in the history of the project, leaving our trappers to scratch their heads and say "I swear that trap was right here". And speaking of unexpected surprises, this was also the first year that we learned the literal meaning of "horsepower". When a trapper wakes up in the morning after a steady rain has fallen, they might think to themselves "I hope my truck doesn't get stuck today". In very rare cases they might think "I hope my truck gets stuck today and a team of horses has to pull it out, 'cause that would be really cool." And sometimes they get what they hoped for.

It's taken 40 years of research with numerous collaborators, thousands of animals, dozens of staff, and countless hours in the lab, field and aircraft to fine tune such an effective system to immunize the wildlife population against terrestrial strains of rabies and I think we can safely say that this is the first time we have been this close to eradicating terrestrial rabies in Ontario.

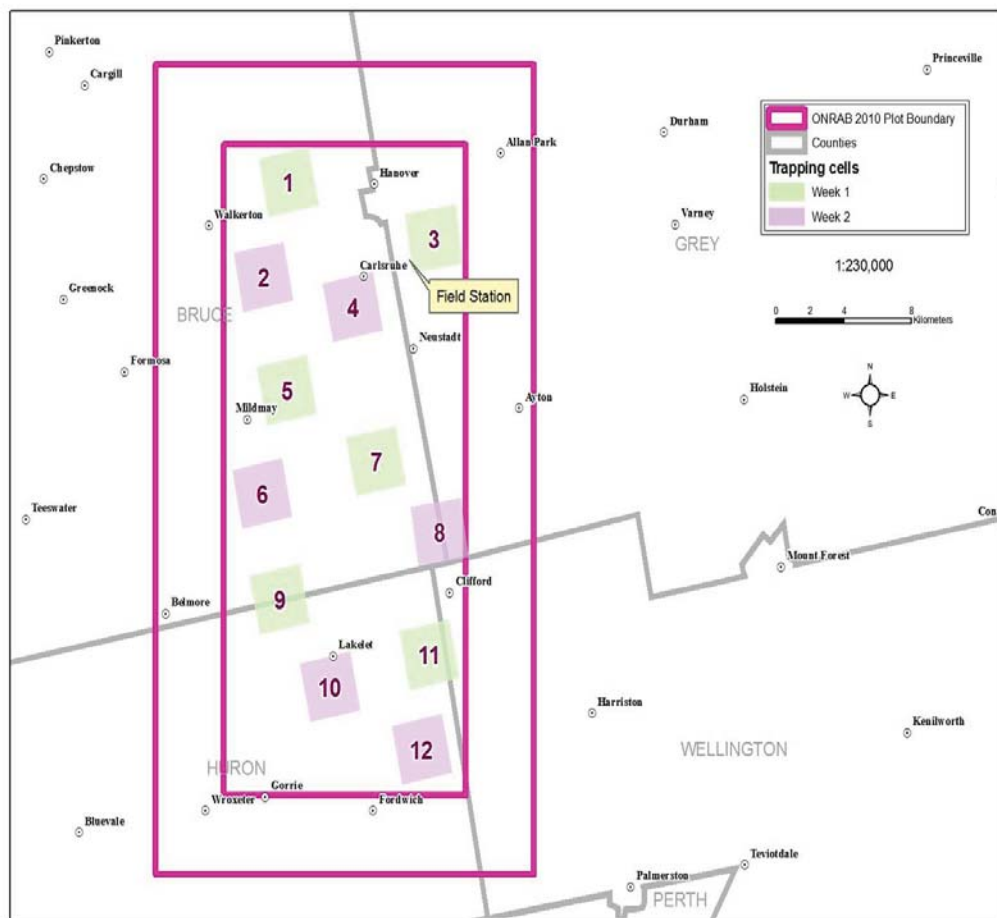


Figure 1. 2010 ONRAB® live surveillance 'experimental' plot boundary with 3km x3km trapping cells.

No documented case of raccoon rabies in the province of Quebec in 2010

Julien Mainguy, wildlife biologist, Ph.D., Ministère des Ressources naturelles et de la Faune du Québec

The use of both aerial and hand baiting with ONRAB® vaccine baits in the last few years (2007-2010), following the population reduction and trap-vaccinate-release (TVR) programs that were performed in the first years when raccoon rabies showed up in Quebec (2006-2007), has allowed to reduced the number of infected animals throughout the years.

In 2010, despite an enhanced surveillance provincial program which has allowed testing of more than 1200 animals (Figure 2), no raccoon rabies cases have been found. This is very encouraging news, as this is the first year without a positive case of the raccoon rabies strain in Quebec since 2005.

The last rabid raccoon documented in Quebec was in 2008, and only two rabid skunks were documented in 2009. However, because of the long continuous border with the infected states of New York and Vermont, which lacks natural barriers such as

large rivers, lakes or mountain ranges, the province of Quebec will need to continue both its control and surveillance activities to try to avoid raccoon rabies from spreading back in Quebec. All the while, also making sure that raccoon rabies is actually completely eliminated from the province.

As of now, we can not consider Quebec as raccoon rabies free, but by continuing our efforts, this seems to be a reachable objective, as has been previously done in Ontario and New Brunswick.

Collaboration with neighbouring provinces and states will be crucial in the next few years in order to attempt to eradicate this viral disease, or at least reduce its prevalence in the Northeast.

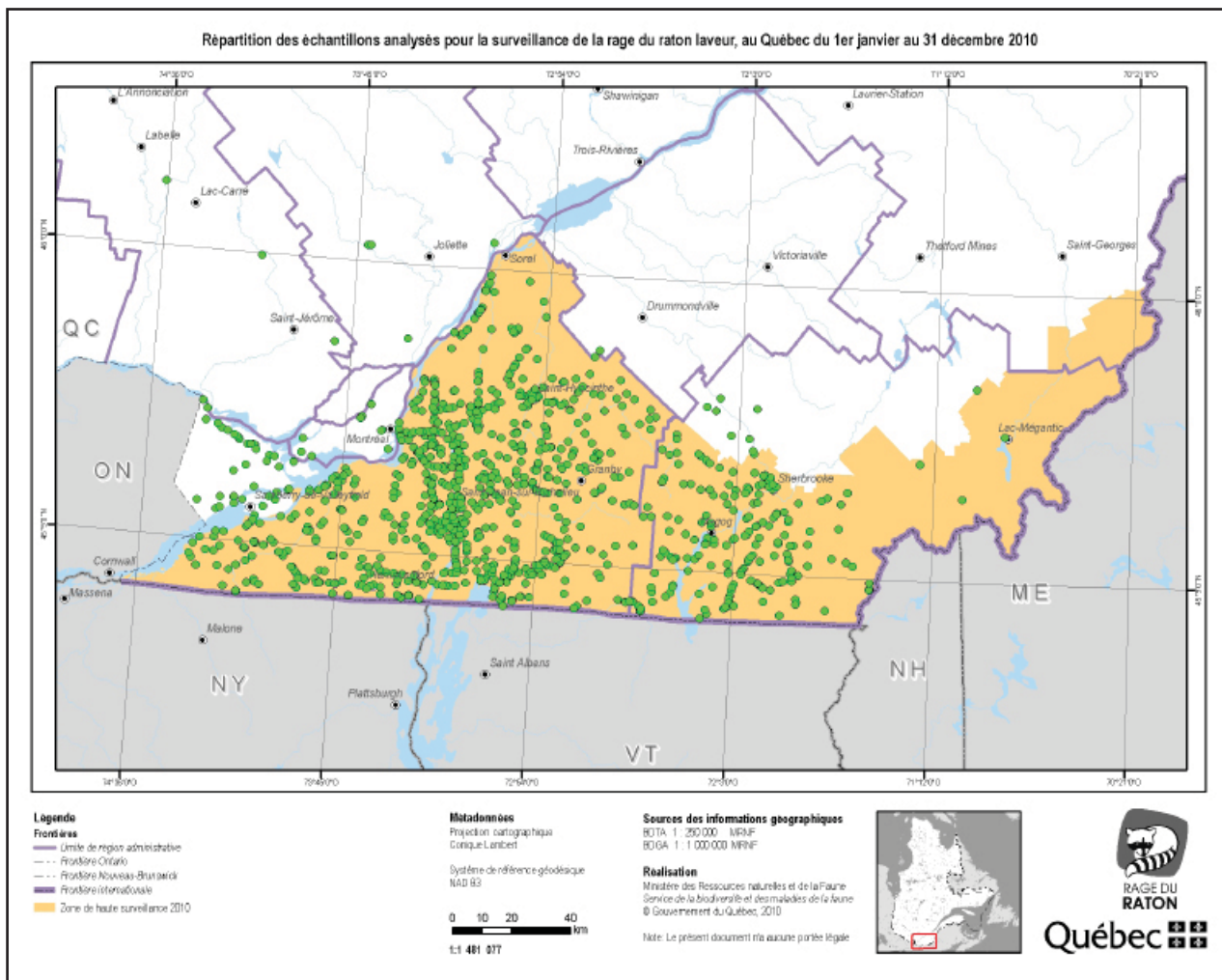


Figure 2. Spatial distribution of the animals that were tested for rabies through the enhanced surveillance provincial program for the raccoon rabies strain in southern Quebec in 2010. All the animals that were tested were negative (N = 1226).

Keeping a finger in the pie: retiring scientist continues to influence rabies research

Canadian Food Inspection Agency Science Branch staff

Most people look forward to relaxing during retirement.

Not Dr. Alex Wandeler, only the third CFIA research scientist to be awarded the Agency's prestigious Emeritus Research Scientist Award.

This is a win-win scenario.

Wandeler will be able to continue his research, mentoring and consulting activities, and Canada benefits by keeping on staff a world-renowned expert in the field of rabies.

"I'm happy, not only for the status or recognition, but that it allows me to keep a finger in the pie," says Wandeler.

Over three thousand cases of fox and skunk rabies were reported in Canada in 1989, the year Wandeler arrived at the Ottawa Laboratory (Fallowfield). Eastern Ontario had the highest level of terrestrial wildlife rabies in North America.

Things have changed: the total number of rabies cases confirmed in Canada between 2000 and 2009 was just over three thousand.

No question the tremendous drop in the number of cases of wildlife rabies can be attributed to the solid scientific work conducted by Dr. Wandeler, his team, and partners in academia, industry, and provincial and federal governments.

The long journey after a Baccalauréat from the Lycée de Berne in 1961

In 1966, Wandeler became a research assistant in the Department of Neuropathology at the Veterinary Faculty in Berne. By 1983, he was not only Chief of the Swiss Rabies Center, but also Director of the World Health Organization (WHO) Collaborating Centre for Research on Zoonotic Diseases, also in Berne, Switzerland.

Wandeler was a key player in the world's first oral wildlife rabies vaccination program. This program ultimately led to the elimination of rabies in foxes in Switzerland and parts of Western Europe.



Dr. Alex Wandeler receives his award from Dr. Martine Dubuc, Vice-President of Science.

He came to Canada in 1989 to take on the job of research scientist at what was then the Animal Diseases Research Institute of Agriculture Canada (now the home of our Fallowfield Lab in Ottawa). His experience in eliminating fox rabies was of definite interest to Canada, and more specifically, to the province of Ontario.

Meeting the Ontario challenge

Ontario provided new challenges. In addition to its size was the issue of access: placing vaccine-laden bait on foot or by helicopter, as was done in Switzerland, would not work. Another method had to be found.

The Ontario Ministry of Natural Resources (MNR) was keen to collaborate with Wandeler and his team. They worked out a partnership: The MNR provided the wildlife biologists for the fieldwork, and Wandeler and his team provided laboratory support and expertise toward testing and obtaining regulatory approval for an effective oral vaccine.

MNR staff conducted extensive work to create a bait that would survive an automated system and remain attractive to

wildlife. With help from private industry, a system was created to release the improved bait from fixed-wing aircraft.

“Alex was a big part of controlling terrestrial rabies in Ontario,” says Dennis Donovan, Coordinator of Rabies Research for the Ontario Ministry.

“Ontario is very appreciative of Alex’s collaborative nature and partnership efforts over the last twenty years. He has truly made a difference in Ontario as we move towards the elimination of terrestrial wildlife rabies. Without his active involvement in the province’s wildlife rabies research and control program, we would have not achieved the outstanding results that we have to date.”

With a combined effort, fox rabies disappeared from eastern Ontario and most of southern Ontario. When raccoon-variant rabies entered Canada from the United States, a combination of a similar oral vaccination process and ground intramuscular injection vaccination (trap, vaccinate and release) were used to eliminate it from Ontario, New Brunswick, and Quebec.

International renown

Wandeler—in recognition of his breakthrough work in Ontario—was, until his retirement, the Director of the WHO Collaborating Centre for Control, Pathogenesis and Epidemiology of Rabies in Carnivores, located at the Ottawa (Fallowfield) Laboratory.

Under his name, the laboratory was also designated a Rabies Reference Laboratory for the World Organisation for Animal Health (OIE).

Few scientists and their laboratories receive such an international honour from both human (WHO) and animal health (OIE) organizations.

Emphasizing the link between humans and animals, Wandeler was also an Adjunct Professor at the Medical School of the University of Ottawa for many years.

“Dr. Wandeler’s research is not constrained by laboratory walls. The work he conducted in Canada is available to labs around the world,” says Dr. Brian Evans, the Chief Veterinary Officer for Canada.

His success with rabies research has brought him international recognition and has also brought great credibility to the Agency.

The methods developed under his guidance were published for international use. The monoclonal antibody and reference virus collections amassed during his tenure are some of the largest in the world. They are in demand and made freely available to laboratories internationally.

Controlling stray dog population

According to Veterinarians Without Borders, someone in the world dies of rabies every ten minutes. Most of the victims are children in Africa and Asia where rabies, transmitted by dogs, remains a major problem.

Wandeler continues to be involved in the fight to save these lives. As the scientific advisor for the Marwar Animal Protection Trust, he lends expertise in the gathering of data required for planning, organizing and monitoring the implementation of a rabies control program.

There are about 25 million stray dogs in India and the Marwar Trust is “dedicated to eliminating rabies in India”. Controlling the stray dog population and canine rabies will reduce the number of people dying of rabies and will improve animal welfare.

“Alex has been a superb ambassador for the CFIA and Government of Canada in both domestic and international arenas, transferring knowledge, expertise, and methodologies to provincial and foreign governments and agencies worldwide,” says Dr. Martine Dubuc, the CFIA’s Vice-President of Science Branch.

The CFIA is committed to recognizing its researchers for their excellence, innovation, and contribution to science.

As a CFIA Emeritus Research Scientist, Wandeler will continue to influence the scientific community. He will be nearby to guide and advise the next generation of research scientists, particularly in regard to this important disease.

May his fingers be busy in many pies well into the future.

News and updates

Congratulations to Matt Purvis in his new position as a Biologist with Wildlife Research and Development, MNR.

Welcome to Tara MacDonald, who was the successful candidate for the wildlife technician position with the section.



Welcome back to Andrew Silver, who will be returning from his acting assignment as a Conservation Officer.

Rabies diagnostic submissions from Ontario between 2005 and 2010

Pamela Hamill & Christine Fehlner-Gardiner - Canadian Food Inspection Agency, Centre of Expertise for Rabies, Nepean, ON

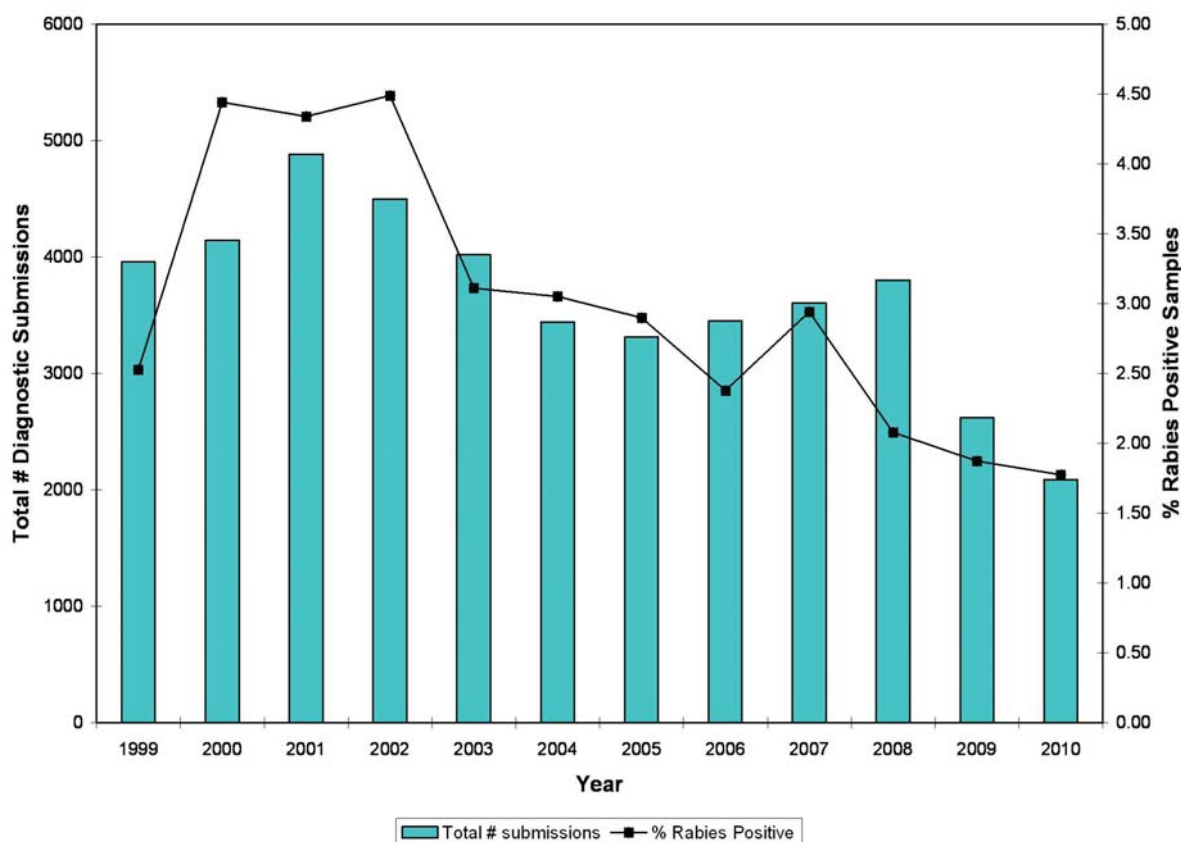
The Canadian Food Inspection Agency (CFIA) carries out rabies diagnostic testing for suspect animal and human cases in Canada. Testing is performed primarily for public health purposes, where the suspect rabid animal has had contact either with a person or a domestic animal (defined as “diagnostic” samples). These cases are investigated by CFIA District Veterinarians and if these criteria are met, the samples are submitted to the laboratories in Ottawa and Lethbridge for testing. In addition, the CFIA performs rabies testing on a contractual basis for provincial wildlife surveillance programs which focus on species that are key hosts for the rabies virus in relevant geographical areas and for which there were no human or domestic animal exposures (defined as “surveillance” samples). Over two decades of concerted rabies control strategies applied in Ontario have resulted in a dramatic decrease in the numbers of positive diagnoses in both terrestrial wildlife vector species such as red foxes, skunks and raccoons, as well as ‘spillover’ cases in domestic pets and livestock. During this time, the annual number of diagnostic samples submitted to the CFIA laboratories for testing also decreased significantly¹.

Prior to the beginning of the control campaign by the Ontario Ministry of Natural Resources (MNR) in 1989, which targeted rabies in red foxes [1], the number of diagnostic samples submitted for testing from Ontario were consistently more than 8000 per year. The number of samples submitted subsequently declined each year following the implementation of the red fox rabies control measures (with the exception of 1993) and by 1996 had decreased to less than half that of the numbers typically submitted in the late 1980s (4002 submissions in 1996 versus 8434 in 1989). A substantial concomitant reduction in the percentage of rabies-positive diagnostic submissions from Ontario resulted from the rabies control campaigns; the proportion of rabies positive

samples submitted from Ontario in 1989 and for several years prior was over 22%. By 1996, however, the percentage of rabies-positive samples had decreased to 4%, highlighting the significant differences in both the total numbers of diagnostic submissions and the percentage of these submissions found to be positive in the pre- and post-rabies control campaign years. However, as rabies in the fox population was successfully targeted in eastern and southern Ontario between 1989 and 1996, the threat of the incursion of raccoon variant rabies northwards into Ontario from the United States prompted additional specific control measures to prevent the spread of this new variant in the province [2]. Pre-emptive control measures were initiated by MNR in 1994 and further control tactics were introduced in 1999 in response to the detection of the first case of raccoon rabies in July of that year. A total of 132 cases were diagnosed between July 1999 and September 2005.

During the outbreak of raccoon variant rabies, the total number of diagnostic submissions from Ontario (all species) increased

Figure 3. Total numbers of rabies diagnostic samples submitted from Ontario and the percentage of these samples that tested positive for rabies between 1999 and 2010. The graph shows the data for the total numbers of samples of all species combined for each year (solid bars with scale on left hand Y axis) and the % of the submitted samples per year that tested positive for rabies by fluorescent antibody test (FAT)-data shown as single data points with scale on right hand Y axis).



¹ Data concerning Diagnostic samples are the property of the CFIA and should not be reproduced without prior consent.

from 3958 in 1999 to a peak of 4884 samples in 2001. The numbers subsequently decreased each year until 2005, in which 3313 samples were submitted (Figure 3). The percentage of positive cases amongst samples from Ontario followed a similar overall pattern during this period, increasing from 2.5 % in 1999, to a plateau of between 4.3 and 4.5 % between 2000 and 2002. The rates of positive samples then decreased each year until 2005, in which the rate was 2.9 % (Figure 3). Overall, the emergence of raccoon variant rabies in Ontario did not have a dramatic effect on the numbers of diagnostic samples submitted for rabies testing, although it did coincide with a transient increase in the rate of positive samples. This is in contrast to the experience in New York State, where the emergence of raccoon rabies was accompanied by a four-fold increase in diagnostic sample submissions between 1989 and 1993 [3]. With the control strategies employed by MNR successfully controlling the outbreak of raccoon variant rabies in Ontario, what has happened to the numbers of diagnostic samples submitted for testing since the last case in 2005?

Numbers of Diagnostic samples submitted for rabies testing between 2005 and 2010

The total number of diagnostic submissions from Ontario increased very slightly, by approximately 4-5 % each year between 2005 and 2008 (Figure 3). In 2009 and 2010, however, the total number of diagnostic submissions from Ontario declined significantly by 32% and 46%, respectively, as compared with the number submitted in 2008. The total numbers of submissions received in 2009 and 2010 (2618 and 2086 samples, respectively) are the lowest since the introduction of rabies control measures in Ontario in 1989. To

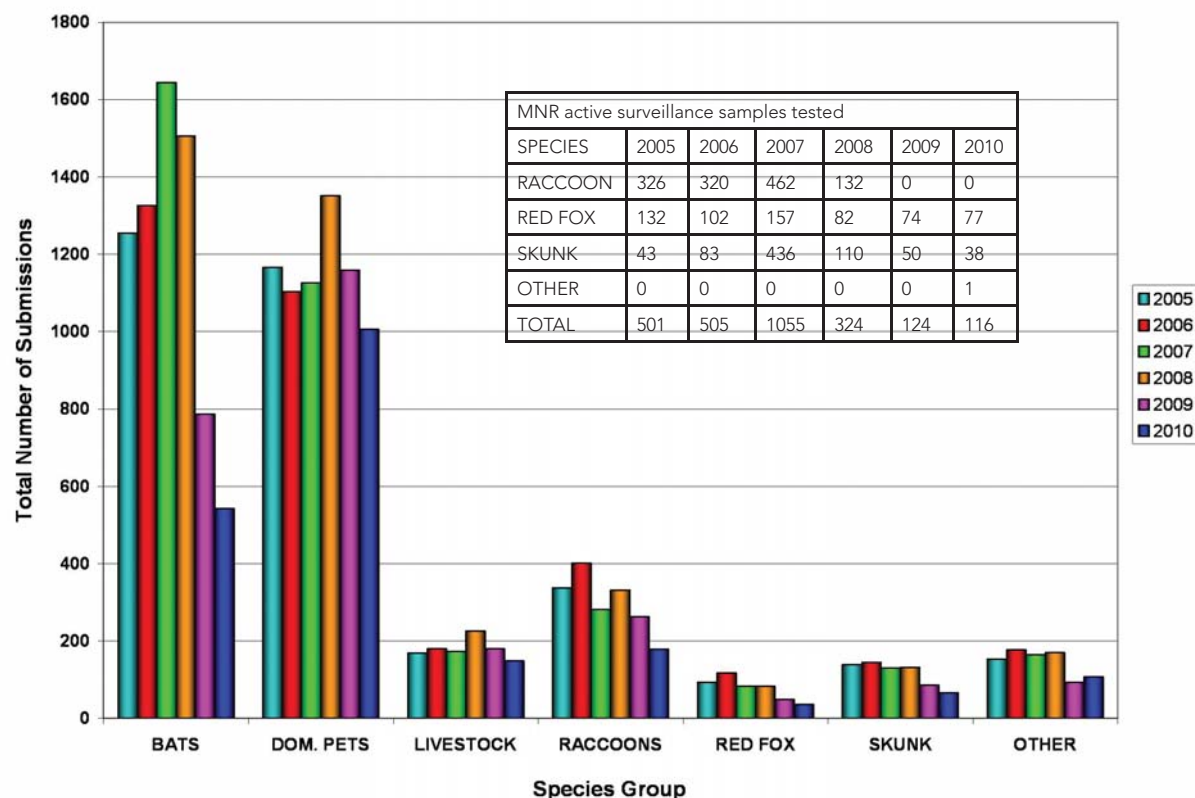


Figure 4. Total numbers of rabies diagnostic samples submitted from Ontario between 2005 and 2010, with data grouped by species type or category. The numbers for important terrestrial wildlife vector species such as raccoons, foxes and skunks are reported individually whereas other species are grouped into general categories (bats, domestic pets, livestock and other wildlife). Inset: Table showing the numbers of active rabies surveillance samples submitted by MNR for diagnostic testing between 2005 and 2010.

**OTHER includes: antelope, bobcat, black bear, badger, beaver, deer, chipmunk, rabbit, coyote, eland, elk, squirrel, fisher, groundhog, gopher, mouse, kangaroo, weasel, marten, muskrat, mole, mink, moose, mountain goat, opossum, porcupine, prairie dog, tahr, vole, wolf, rat, other zoo animals.*

examine whether the decrease in submission numbers in recent years is attributable to a general decrease in the numbers of all different species received or whether specific species or groups of animals have decreased, the submission number data were analysed further. Figure 4 shows the numbers of diagnostic submissions received from Ontario between 2005 and 2010, with the data grouped by individual species or categories of species.

In general, the data show that for most species and categories of animals, the numbers of submissions between 2005 and 2008 have remained fairly stable, showing no particular upward or downward trend. In 2009 and 2010, however, the numbers of submissions of raccoons, red foxes, skunks and animals in the 'other' category decreased relative to the preceding years. The numbers of domestic pet submissions also decreased slightly in 2010 while in contrast, the numbers of livestock submissions have remained steady throughout the entire post-raccoon rabies period in Ontario.

The data for bat submissions are distinct since the incidence of rabies in bats is due to bat rabies variants and is unaffected by the control measures that are used to target rabies in terrestrial species.

The numbers of bats submitted for testing increased between 2005 and 2007, reaching a peak of 1644 submissions in 2007. The number of submissions has subsequently declined considerably, notably decreasing by almost half between 2008 and 2009 and dropping a further 31 % between 2009 and 2010. The reasons for this sharp decrease in bat submissions are unclear however two factors that may have influenced the number of bats submissions are a) changes in the recommendations regarding the management of bat exposures to prevent human rabies [4] which may have altered the stringency of the criteria used by Public Health to request testing for rabies, and; b) the emergence of white nose syndrome in Ontario in March 2010, although it is unclear whether this disease as yet has negatively impacted bat populations in Ontario [5].

The data indicate that the combined effect of a decrease in submissions of the majority of species groups, but particularly in bats (Figure 4), is responsible for a marked overall decrease in the total numbers of rabies suspect samples submitted in 2009 and 2010 (Figure 3).

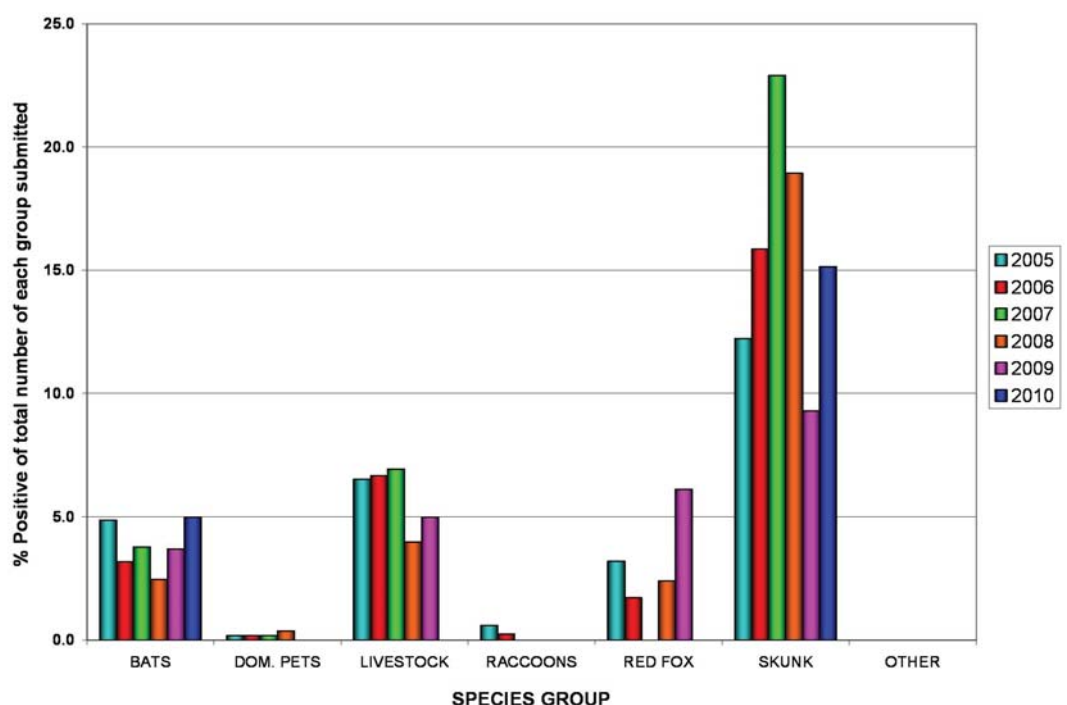
Since the CFIA criteria for diagnostic testing are selective for animals that are suspect rabid and that have had contact with either domestic animals or people, the overall aim being the prevention of rabies transmission to people and their domestic animals, the data presented here do not represent a survey of the incidence of rabies in the general wildlife population. MNR has for many years, like several other Canadian provincial stakeholders, conducted 'active' rabies surveillance focussing on raccoons, skunks and foxes. This type of more randomised testing approach is perhaps more informative about the general incidence of rabies in these important terrestrial wildlife vector species. The total number of surveillance samples submitted from Ontario between 2005 and 2010 is provided in the table inset in Figure 4.

Percentage of rabies positive samples from Ontario detected between 2005 and 2010

Overall, there has been a steady downward trend in the percentage of samples found to be rabies-positive since 2003 (with the exception of a small increase in 2007-Figure 3). However, the data showing the rate of positive samples for individual groups of vector species indicate that this trend does not hold true for all vector species (Figure 5).

The rate of raccoons found to be rabies positive has been extremely low or zero since 2005. Very low values of 0.6 % and 0.2 % positive were reported in 2005 and 2006 but in the following four years since then, no rabies-positive raccoons have been diagnosed amongst samples originating from Ontario. One of the two positive raccoons diagnosed in 2005 was the final raccoon variant rabies case reported in Ontario. Otherwise, positive raccoons were infected with fox variant rabies. The percentage of positive foxes has been variable during the period between 2005 and 2010, showing no particular trend. There were no positive cases from Ontario in 2007 and 2010, and the percentage of positive cases varied between 1.7 (2006) and 6.1 (2009) in other years during this time. Interestingly, one of the three foxes found to be positive in 2009 was infected with a bat rabies variant. Likewise, the percentage of positive skunks from Ontario has fluctuated considerably between 2005 and 2010. The percentage of positive cases increased from 12.2 to 22.9 between 2005 and 2007, although the total number of skunk submissions remained stable. The proportion of positives decreased in 2008 and 2009 only to rise again to 15 % in 2010. Although the percentage of positive cases may seem quite high, it should be noted that the total numbers of skunk submissions, as with foxes and animals in the 'other' category, are relatively low, meaning that a handful of positive cases can generate high percentage positive rates. With the exception of one positive skunk in 2007 that was found to be infected with a bat rabies variant, all other cases of skunk rabies diagnosed were caused by a fox rabies variant.

*Figure 5. The percentage of Diagnostic samples submitted from Ontario within each species or species category diagnosed as rabies positive between 2005 and 2010. The percentages for important terrestrial wildlife vector species such as raccoons, foxes and skunks are reported individually whereas other species are grouped into general categories (bats, domestic pets, livestock and other wildlife). *OTHER includes: antelope, bobcat, black bear, badger, beaver, deer, chipmunk, rabbit, coyote, eland, elk, squirrel, fisher, groundhog, gopher, mouse, kangaroo, weasel, marten, muskrat, mole, mink, moose, mountain goat, opossum, porcupine, prairie dog, tahr, vole, wolf, rat, other zoo animals.*



The percentage of positive cases amongst domestic pets has remained extremely low or zero throughout 2005-2010. Only 2 cases per year (0.2%) were reported between 2005 and 2007, 5 cases (0.4%) diagnosed in 2008 and no positive cases at all in 2009 and 2010. The percentage of positive cases in the livestock category remained steady (average 6.7%) between 2005 and 2007, but has decreased in the three years following to the extent that in 2010, there were no positive cases amongst the livestock samples submitted at all, despite the fact that total submission numbers in this category have remained constant during this time. The data for livestock and domestic pets are encouraging in that it appears there have been increasingly fewer spillover rabies cases in the past two years. One bovine positive case in 2009 was due to a bat virus variant; all other livestock and domestic pet positive cases were identified as fox rabies virus variant.

Although the total number of suspect rabid bat submissions has fallen significantly in the past two years, it is noteworthy that the percentage of those samples diagnosed as positive has not followed a similar downward trend. Rather, it has fluctuated between values of 2.5 % (2008) and 5.0 % (2010) during this time and no particular trend has been evident in the percentage of rabies-positive bats since 2005. As expected, all positive bat specimens were attributable to bat rabies variants.

In summary, in the six years since the last case of raccoon variant rabies in Ontario occurred in 2005, both the total numbers of diagnostic submissions (all species) from Ontario and the percentage of these submissions that are rabies-positive have decreased. The total numbers of diagnostic submissions from Ontario in 2009 and 2010 are the lowest since rabies control campaigns were initiated to target fox variant rabies in the province in 1989. The overall reduction in rabies diagnostic submissions can partly explain the associated reduction in the percentage of these samples found to be rabies positive, however the downward trend does not hold true for all species or categories of animals. Further, in some cases, such as bats, the percentage of positive samples has remained stable despite a significant drop in the numbers of submissions. Also of note during this time is that there have been no positive raccoons from Ontario diagnosed since 2007, no positive cases amongst domestic pet samples submitted in both 2009 and 2010 and in addition, no positive cases amongst livestock samples submitted in 2010.

1. MacInnes CD, Smith SM, Tinline RR, Ayers NR, Bachmann P, Ball DG, Calder LA, Crosgrey SJ, Fielding C, Hauschildt P, Honig JM, Johnston DH, Lawson KF, Nunan CP, Pedde MA, Pond B, Stewart RB, Voigt DR. Elimination of rabies from red foxes in eastern Ontario. *J Wildl Dis.* 2001; 37 (1):119-32.
2. Rosatte RC, Donovan D, Allan M, Bruce L, Buchanan T, Sobey K, Stevenson B, Gibson M, MacDonald T, Whalen M, Davies JC, Muldoon F, Wandeler A. The control of raccoon rabies in Ontario Canada: proactive and reactive tactics, 1994-2007. *J Wildl Dis.* 2009 45 (3):772-84.

3. Rupprecht CE, Smith JS, Fekadu M, Childs JE. The ascension of wildlife rabies: A cause for public health concern or intervention? *Emerg Inf Dis.* 1995; 1:107-114.
4. Canadian Communicable Diseases Report (CCDR), Volume 35, November 2009.
5. Ontario Ministry of Natural Resources: Status of White Nose Syndrome in Ontario (Jan 14, 2011): <http://www.mnr.gov.on.ca/en/Business/FW/2ColumnSubPage/289678>.

The RRDU has its own hero - a tribute to Dr. Kenneth Lawson

Scott Taylor, Rabies Research and Development Unit, MNR

How many times can one person retire in a single lifetime?

Dr. Kenneth Lawson has retired at least four times, since I have been counting. The last time was this past summer when Dr. Lawson decided to retire from his long standing on the Rabies Advisory Committee. This committee's members are from federal, provincial and municipal governments as well as the members of the public.

To back up a bit, Dr. Lawson (before he was Dr. Lawson) was a World War II Spit Fire fighter pilot. Ken flew reconnaissance flights for the allies over occupied parts of Europe and has many stories told over a cup of java. After the war, Ken decided that he would retire from the military and go to school to be trained as a veterinarian.

Dr. Lawson's second retirement was from Connaught Laboratories as a Veterinarian working on vaccine research. Dr. Lawson played a

Dr. Ken Lawson at the Ad Astra ceremony in September.



large role in developing the ERA rabies vaccine for the MNR.

When Dr. Lawson retired from Connaught Laboratories, the Rabies Research and Development Unit jumped on the opportunity to hire him on contract for bait development. I had the pleasure with working alongside Dr. Lawson while he was testing different shapes and sizes of vaccine blister-paks and baits. Dr. Lawson also tried and tested different flavours of bait attractants. It would be nothing for Dr. Lawson to show up with 10-20 different bait flavours ranging from fish, vegetable, cheese, sugar, peanut butter and my all time favourite; insect essence.

Dr. Lawson finally retired from the MNR after developing the current bait size “ultra-lite” that is used today to vaccinate wildlife in Ontario, Quebec and beyond.

Dr. Lawson officially retired from the rabies business this past summer when he gave his retirement notice from the Rabies Advisory Committee. He has been a member on the committee since 1995 and decided to retire at the age of 90.

It was decided that something special had to be done for such a great individual, who protected our freedom in battle during WW II, as well as battled rabies to protect our pets, livestock and children. An “Ad Astra” stone, dedicated to Dr. Lawson, was placed at the National Air Force Museum of Canada in Trenton, Ontario.

On September 25, 2010, a ceremony to commemorate Ken, and 9000 others who served Canada in the armed forces, took place. This stone is a small gesture from us to say “Ken, thanks for everything!”

2010 rabies baiting crew



Another great season! A journal of the 2010 aerial baiting operations

Mark Gibson, Rabies Research and Development Unit, MNR

The 2010 aerial baiting program began in mid-August, then picked up again and finished mid-September. MNR rabies and aviation staff baited Quebec, eastern Ontario (Brockville and the Canadian islands near Kingston), and southwestern Ontario.

August 15

The day looked rather gloomy, but nevertheless two of the rabies staff, with computers and electronics in tow, started off early for their drive to Bromont, Quebec to meet up with one of the Twin Otter planes, “OGA”. The second group headed out to meet up with “OGB” in Kingston to install the equipment before baiting. But just as their journey began, one of the pilots from Sudbury called to advise the crew that they would be grounded for most of the day because of poor visibility and a low ceiling. Because MNR’s baiting contract with Quebec was scheduled to start on Monday, it was best for the aviation staff to fly directly to Bromont when the weather lifted. Then we could bait the islands on the way back home. So the two rabies crews met up to transfer the baiting equipment into one truck, and one crew continued on to Bromont.

August 16-20

Over this 5 day period, the Ontario MNR planes and staff distributed 810,804 ultra-lite baits over 9,428 km² in Quebec. Operations included 37 flights with 76.5 hours of flying time.

August 21

With Quebec completed, “OGA” headed for its home base while “OGB” flew to Kingston to pick up the baits and crew to complete the Canadian islands and Brockville. We decided to first tackle the mainland baiting in response to a couple of positive raccoon cases across the river on the New York side. A total of 16,440 baits were dropped over 219 km² on the mainland before moving on to bait Simcoe, Wolfe and Howe islands. A total of 13,693 baits were dropped over 183 km² on the islands to finish off the first half of this year’s baiting.

September 12

The Ontario portion of baiting was scheduled to start and the baiting staff gathered at the MNR compound to complete last minute paperwork, as well as coordinate crews, gear and vehicles for the trip to Stratford. We arrived at the airport in time for lunch; and after a brief meeting it was time to offload the planes, complete the aircraft safety briefings, and baiter and navigator training. For most of us, flying was old hat but every year there are

always a few newbies to put through the ringer. It was decided that since the weather was nice, we should get the new folks paired with an experienced person and loaded up for their inaugural flights. Things ran smoothly and we managed to cross two flights off our posted flight map. From there, it was off to the hotel to check-in before meeting up with the pilots, engineers and radio operator to talk 'shop' over dinner at Molly Blooms.

September 13

Crews were up and at 'em by 6am to grab an early breakfast before heading to the airport for our first full day of baiting. Once the computers were warmed up and the planes loaded with baits, the crews were off the ground by 7am – greeted by the first rays of the rising sun. After two hours the planes returned and, as always, there were a few walking wounded with complementary white bags as souvenirs. About mid-day, the airport had two executive jets warming up and making a ton of noise out on the tarmac. There were whispers that Christopher Plummer and his entourage were boarding a jet after his last performance of *The Tempest* at the Stratford Festival the previous night. So one brave MNR staff member marched right out and asked him for his autograph and chatted with him for a few minutes before the star walked the red carpet to board the jet. Old hat for some, maybe, but there is always something new to see during baiting! As the day progressed, the flights got progressively bumpier as the sun heated things up, however it stayed nice enough to get the Meaford tank range flight done. We completed a total of nine flights for the day.

September 14

The morning looked promising with a colourful sunrise and, at the crack of dawn, the crews were off! Once the fog lifted, we were hoping to get the ONRAB® experimental flights started, as well as knock off the long flight to the north. The first flights landed after two hours and the longer flight up to the Bruce Peninsula was planned. That being said, we ended up dividing that flight in half so we could refuel in Wiarton. The pit stop also gave the crew a chance for a washroom break and to learn some local history about Eileen Vollick. The day went off without a hitch and we managed to get an additional nine flights done.

Niagara Falls from the air

September 15

The day started with one of the "twins" being loaded to complete the two Niagara flights from Niagara on the Lake to Fort Erie, while the other plane had a small window of time to go and do the flight over Base Borden. Those lucky enough to be on the Niagara flights had the opportunity to "climb" a little higher and view the famous Horseshoe and American Falls from the air. Unfortunately, the Base Borden flight was turned back due to foggy weather and had



to be completed at the end of the day. Because of the ferry time involved, we only managed to get 7.5 flights done.

September 16

We met at our usual time for breakfast but the pilot's weather forecast for today wasn't looking too good. By the time late morning rolled around, the long range forecast was predicting rain for the remainder of the day. After we had lunch at the airport, we decided the day was scrubbed so everyone had a free afternoon. Some folks lounged around the hotel and swam, while others went to check out what Stratford had to offer. It was also "Beat the Clock" at Molly Blooms, meaning that whatever time you arrive at the restaurant is what you paid for a steak. So of course, some of us were there as soon as the clock started to take advantage of the savings!

September 17

Everyone's batteries were recharged after our low key day the day before, so we were ready to go and make up some time. That being said, the morning flights were off as soon as it was light enough. "OGA" was picking away at the regular flights while "OGB" continued to work on the high density management flights. After lunch, some local media arrived to cover this year's baiting and MNR's Garry Wice worked on a piece about MNR's aviation services. The story looked at their role in the rabies baiting operations, but also the other projects their fleet and staff are involved in. We took the media up for a short flight, close to the airport, to get some footage. Then we dropped them off and continued on, wrapping up the day with 9.5 flights being completed.

September 18

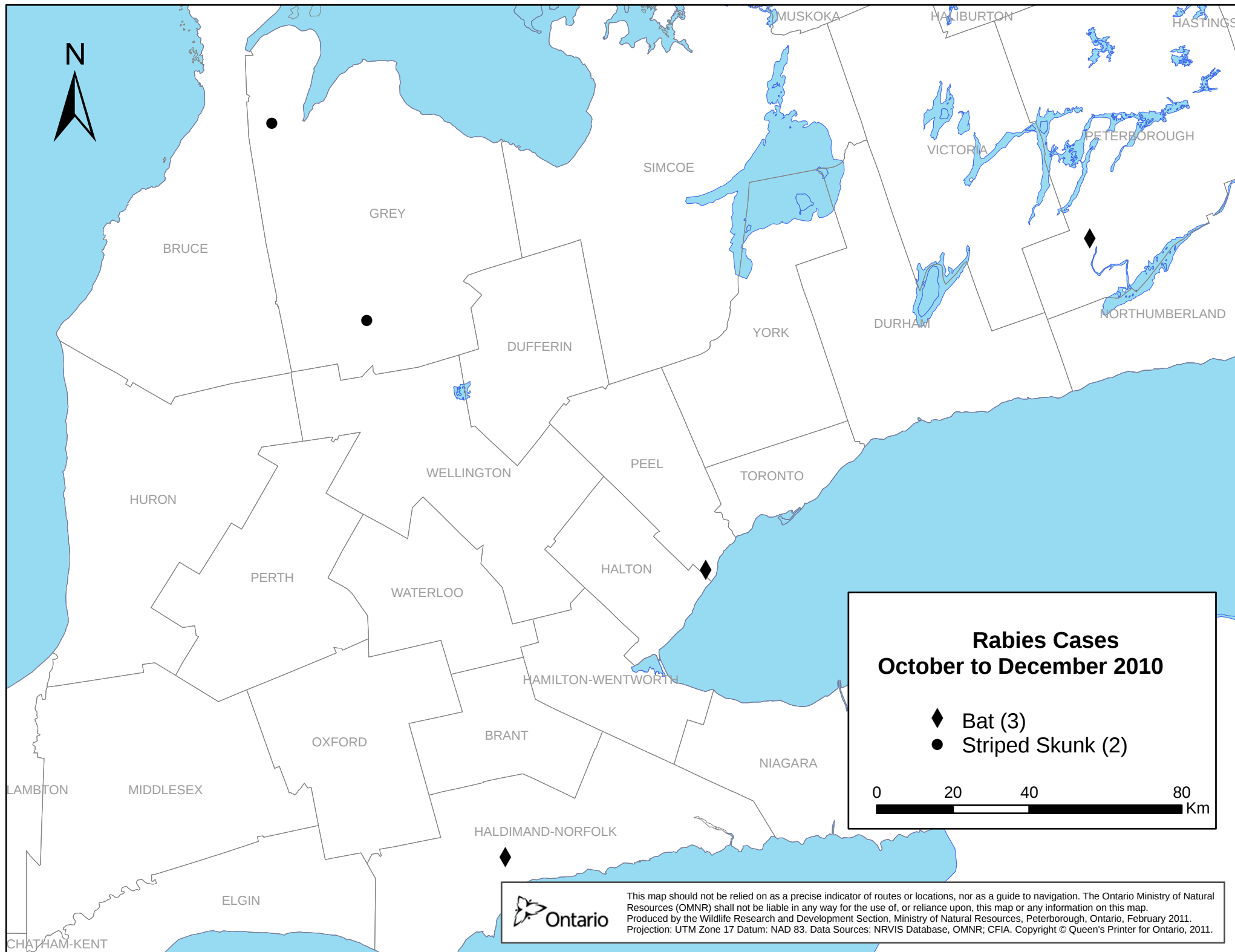
With it being Saturday, the hotel restaurant started breakfast later so the crews were allowed an extra hour of shuteye before getting to the airport. The weather was supposed to hold so we were hoping to finish up the last remaining seven flights. Once the second plane landed mid-afternoon, the crew gathered for a group shot before the bait machines were removed and loaded for the ride back to Peterborough.

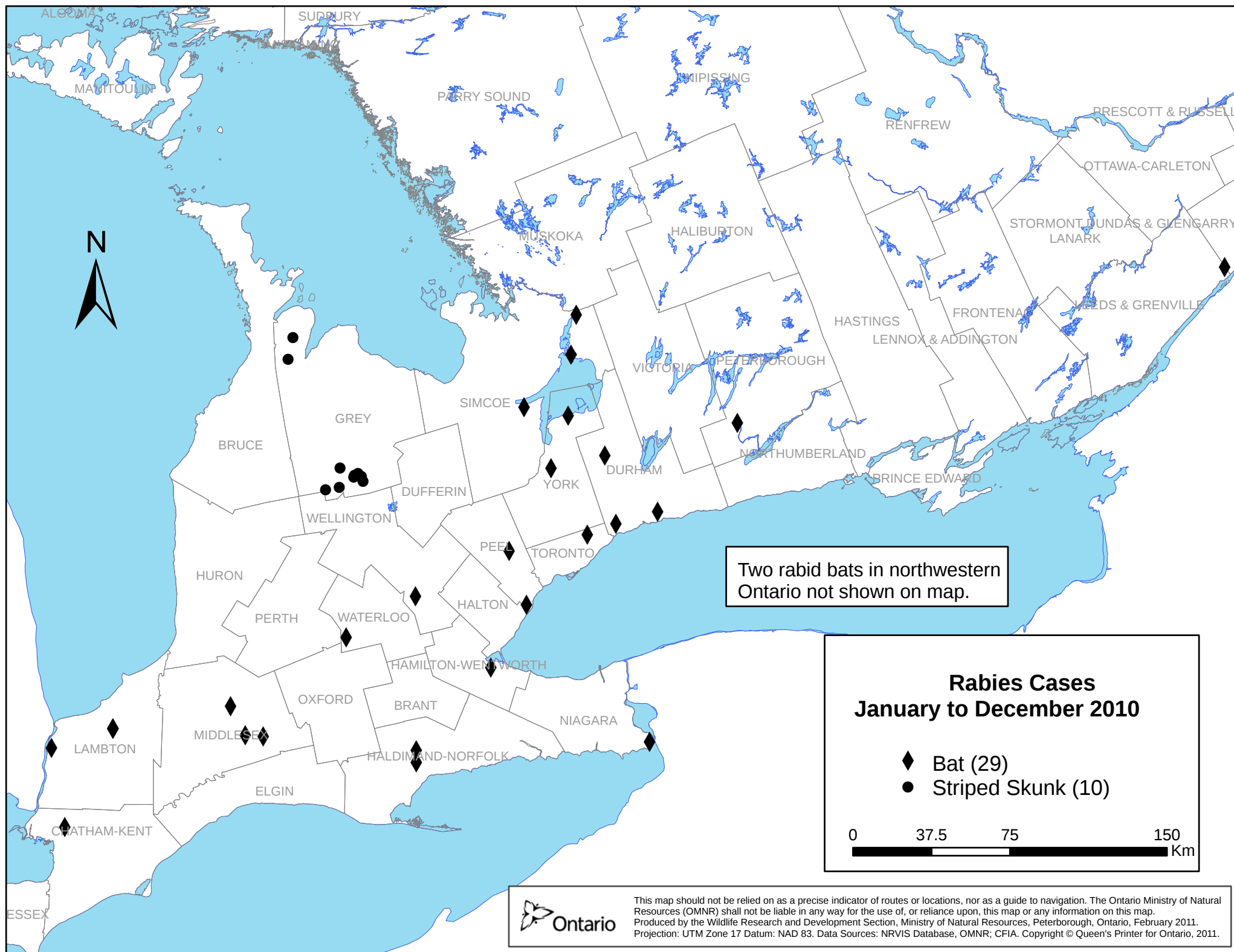
September 19

With another successful baiting campaign wrapped up, it was time to get our last breakfast into us before hitting the road home. We made one pit stop so that we could pick up a local newspaper to see the article on baiting.

By mid-afternoon, the baiting supplies and machinery were offloaded and stored for another year.

All in all, we flew 45 flights over the week, dropping 654,621 ultra-lite baits over 26,639 km² using 97.4 hrs of flying time.





Animal Rabies Report: October to December 2010																											
Animal Type	Fox			Raccoon			Skunk			Other Wildlife			Bat			Dog			Cat			Livestock			Totals		
County or Region	#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative	
		10	09		10	09		10	09		10	09		10	09		10	09		10	09		10	09		10	09
Adams	1			1			1			1			1			1			1			1			1		
Alameda	1			1			1			1			1			1			1			1			1		
Albany	1			1			1			1			1			1			1			1			1		
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Albany	1			1																							

[illegible]

Central

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	Western
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Animal Rabies Report: October to December 2010

Animal Type	Fox			Raccoon			Skunk			Other Wildlife			Bat			Dog			Cat			Livestock			Totals		
County or Region	Cumulative			Cumulative			Cumulative			Cumulative			Cumulative			Cumulative			Cumulative			Cumulative			Cumulative		
	#	10	09	#	10	09	#	10	09	#	10	09	#	10	09	#	10	09	#	10	09	#	10	09	#	10	09
Southern																											
Wentworth													1	1											0	1	1
Haldimand-Norfolk												1	2												1	2	0
Brant																									0	0	0
Niagara													1	1											0	1	1
Elgin														3											0	0	3
Oxford																									0	0	0
Middlesex													3	1											0	3	1
Lambton													4	1											0	4	1
Kent													1												0	1	0
Essex																									0	0	0
Northern																											
Muskoka																									0	0	0
Parry Sound																									0	0	0
Nipissing														1											0	0	1
Sudbury														1											0	0	1
Cochrane																									0	0	0
Timiskaming																									0	0	0
Algoma																									0	0	0
Thunder Bay													2												0	2	0
Rainy River																									0	0	0
Kenora																									0	0	0
Regional Totals																											
Eastern	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	1	0	1	4
Central	0	0	1	0	0	0	0	0	0	0	0	0	1	10	7	0	0	0	0	0	0	0	0	0	1	10	8
Western	0	0	2	0	0	0	2	10	8	0	0	0	1	4	11	0	0	0	0	0	0	0	0	8	3	14	29
Southern	0	0	0	0	0	0	0	0	0	0	0	0	1	12	7	0	0	0	0	0	0	0	0	0	1	12	7
Northern	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	2
Totals	0	0	3	0	0	0	2	10	8	0	0	3	3	29	27	0	0	0	0	0	0	0	0	9	5	39	50