Ministry of Natural Resources

Ontario

Natural. Valued. Protected.

The rabies reporter

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April - June 2010

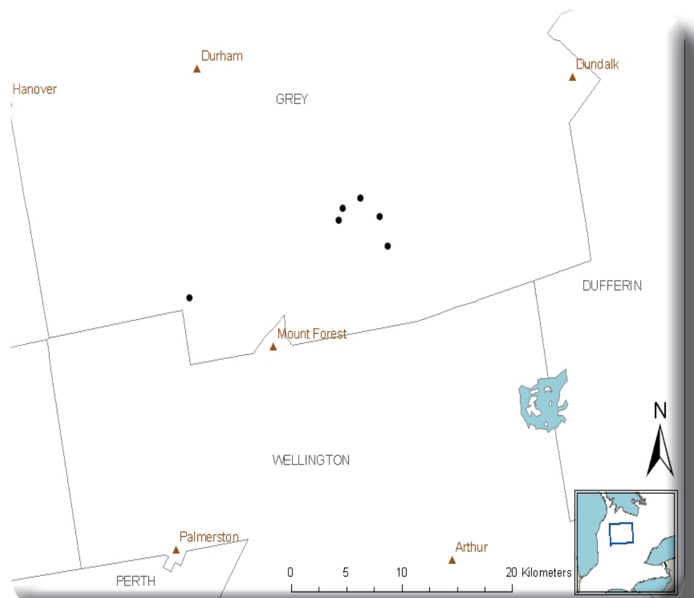
Rabies cases in Ontario during the second quarter

The number of confirmed rabies cases in Ontario has increased substantially from the single case that we had at the end of March 2010.

From April to June, there were six rabid skunks and ten rabid bats diagnosed at CFIA's OLF laboratory in Nepean. Rabies was not confirmed in any other species during this time period. This brings the total for 2010 to 17 cases which is one case more than what we had at the same time last year. At the end of June 2009, there was one rabid fox, three rabid skunks, five rabid bats, and seven rabid livestock. The lack of rabies cases in domestic animals during 2010 is a good sign that public education is working and people are keeping their pets vaccinated.

The bats cases were scattered throughout southern Ontario with most of them occurring in southwestern Ontario – Haldimand-Norfolk (1), Lambton (4), Leeds-Grenville (1), Peel Region (1), Simcoe (1), Waterloo Region (1), and York Region (1). Three of the four bats in Lambton County were from the same colony. Bats from this colony were relocated to Hamilton-Wentworth where they later developed rabies. It is believed that the bats were infected with rabies while they were in Lambton County. The rabid skunks were all clustered in the southern portion of Grey County.

Beverly Stevenson, RRDU, MNR



All six rabid skunks were found in Grey County

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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Spring baiting – taking care of business!

Beverly Stevenson, RRDU, MNR

When the first rabid skunk of 2010 was discovered in May, the Ministry of Natural Resources quickly responded by distributing rabies vaccine baits within an 8km by 8km area surrounding the case. Within three business days, four staff members were distributing baits by hand in rural Grey County to manage this isolated case. Staff worked in pairs to distribute baits at 300 baits/km2 by walking, driving trucks, and using ATVs. Baits were targeted towards skunk habitat i.e. hedgerows, forest edges, roadsides, and buildings (as long as there were no children or dogs in the area).

During the second day of the operations, MNR staff member Val von Zuben discovered a dead skunk in the middle of a farmer's field. Since the skunk was not near any roads or buildings, it was unlikely that the animal had been hit by a vehicle or had been killed by the landowners. We took the skunk carcass with us to have it tested for rabies since it is unusual to find dead wildlife lying out in the open. Tests later revealed that the skunk was rabid.

After picking up the skunk and finishing baiting on other farms, we returned to the farmyard that we had been working out of. Our staff informed the farmer that a dead skunk on his neighbour's farm had been found. He mentioned that he hadn't seen any strange acting skunks but he appreciated knowing that there could be more rabid animals in the area. And lo and behold, the very next day, he found another dead skunk, on his own farm, that tested positive for rabies.

These cases emphasize some of the pros and cons of using various techniques to manage rabies cases. Hand baiting is much more time consuming than aerial baiting. However, hand baiting gives you the opportunity to talk to the landowners and let them know there is rabies in the area. It also provides a chance to educate and remind people to have their pets vaccinated.

Neither the second or third rabid skunk would likely have been discovered if we had done aerial baiting instead of hand baiting. However, since both of these skunks were approximately 3-4 kilometres from the initial case, we had to expand the baiting area to encompass these new cases. In addition to these cases, there was an additional rabid skunk found approximately 20 kms away from the other cases. A job that was thought to only take a few days to complete was turning into a project that would take a few weeks to finish with hand baiting.

It was then that we decided to switch to aerial baiting with a helicopter to cover the entire area quickly. The goal was to respond to the cases before they had time to spread further, which would not be possible if we continued hand baiting.

Helicopter baiting was scheduled to begin Saturday, May 8th, with the hopes of completing the operations within a day or two. What could be more peaceful than spending a nice spring weekend throwing baits out of a helicopter? Sitting in a helicopter would sure beat driving through ploughed fields with an ATV.

Well, the 8th was peaceful but only because the weatherman was predicting gale force winds and we decided on the 7th to postpone the flight for the following day. Mother Nature decided winds weren't enough and decided to throw in a snowstorm as a bonus. Definitely a good plan to cancel the flights for that day! However, we were now faced with having to do the flights in one day because the helicopter was scheduled for other jobs during the week and had to leave on the Monday.

Sunday dawned and we were up early and ready to fly. The helicopter was arriving that morning and when the airport opened at 8:00 a.m., we refuelled and got right to work baiting. After a quick safety briefing, helicopter door removal (so baits could be thrown out), and donning the safety harness (so the baiter wouldn't get thrown out!), we were ready for business.

As I navigated in the front of the helicopter, I sympathized for wildlife technician, Mark Gibson, who was baiting in the back. With the door off the helicopter, and the snow still on the ground from the day before, I knew it would be chilly. We turned the heater on 'high' to try to keep us warm but every time the helicopter turned, it would affect the wind chill. We would go from being comfortably warm one minute to freezing the next minute. Plus, we were constantly turning because we follow the edges of the forest, hedgerows, and river banks while flying. There were very few straight lines flown and I'm sure anyone who was watching

Mark Gibson prepares for helicopter baiting.

Aerial view of the snowy farmers' fields that were baited in May.

us from the ground was wondering what we were doing up there. Although, even if we had wanted to fly in a straight line, I don't think it would have been possible. The gale force winds from the day before had only diminished slightly overnight. The wind sock at the airport should never be straight out when you start your day.

After the first 3-hour flight was finished, we decided that we needed some hot food and some time on the ground to recover, so we took an early lunch. We returned to the airport after thawing out and were ready to go out again. We weren't nearly as enthusiastic as we were at the start of the day. After completing another almost 3-hour flight, we decided to postpone the final flight until the following morning.

Monday morning arrived and we were back at the airport. Only one flight left to go but it would be 3 hours as well. Mother Nature decided to be kind to us that day though. There wasn't the least bit of a breeze and the temperature was much more seasonal. We didn't even have to wear winter coats! It was a good day to finish the baiting and get back to our regular work.

By May 11th, we were back in the office ready to catch up on the tasks that had accumulated while we had been hand and helicopter baiting. Most of the section's wildlife research programs are gearing up at this time of year so there is a lot to be done. Unfortunately, 'Murphy' decided to give us a hand and we found out that there was a fifth rabid skunk in Grey County. It was found a couple of kilometres south of the previous cases so it was an additional area that needed to be hand baited. But now, most of our research staff were busy with other field projects and I had to call in a seasonal staff member to assist with the baiting. We definitely wanted to get out there quickly as farmers were busy planting crops and once the fields were planted and growing, it would be unlikely that they would want us to drive over their fields. With good weather, we managed to bait the entire area by hand in one very long day.

Back to the office and things were finally quiet on the rabies front. Two weeks went by and no new cases. Animals that ate the bait would be starting to develop antibodies from the baits that we had distributed earlier in May.

There was one more rabid skunk at the end of May. This time, it was a farmer who found it close to the first case in Grey County. He knew there was rabies in the area because we had baited his farm by hand in early May. This is a great example that 'on the ground education' works. Because this case was so close to the first one, we only had to bait an additional 1,200 acres. After calling on our volunteer again, we managed to get that small area baited over one very wet day.

It's been over a month without another positive case discovered in the area but there have been occasional reports of strange behaving animals. Hopefully our high density baiting is effective and the small, spring outbreak will die out without any more positive rabies cases.

Reunión Internacional
XXI RITA
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Rabies in the Americas conference 2010

From October 17-22, 2010, the 21st International Conference on Rabies in the Americas will be taking place in Guadalajara City, Mexico.

RITA is an international event that gathers together leaders working on human and animal rabies. The conference will focus on the state of research, latest discoveries and prevention, control, and surveillance techniques.

This annual meeting has hosted delegates from more than 20 countries spread over the 5 continents since 1990.

For more information, visit www.rabiesintheamericas.org.

White-Nose Syndrome of Bats

Dr. Ian Barker, Canadian Cooperative Wildlife Health Centre

About 20 species of bats, some of them rare or threatened, reside in Canada. While 'tree bats', such as the Hoary Bat (***Lasiurus cinereus***), Eastern Red Bat (***Lasiurus borealis***), and Silver-haired Bat (***Lasionycteris noctivagans***) migrate south to overwinter, 'cave bats', such as the Big Brown Bat (***Eptesicus fuscus***), Little Brown Bat (***Myotis lucifugus***) and less common species of Myotis, as well as the Eastern Pipistrelle or Tricoloured Bat (***Perimyotis subflavus***) overwinter in hibernacula, usually caves or abandoned mines. These sites provide the critical humid, cool but non-freezing thermal environment required for hibernating bats to survive many months of torpor without food.

While some hibernacula house only a few hundred bats, others harbour many tens of thousands. Concentration of large numbers of hibernating animals at relatively few sites, and the huddling behaviour of many species of bats, makes large proportions of a population susceptible to factors such as natural disasters, disturbance by scientists or cavers, destruction by vandals, and, potentially, infectious diseases.

A condition known as White-nose Syndrome (WNS), documented first in February 2006 in a Myotis sp. in a cave west of Albany, New York, appears to have spread subsequently to bat hibernacula over 9 northeastern American states (2006/07 - New York; 2008 - Vermont, Massachusetts, Connecticut; 2009 - New Jersey, Pennsylvania, New Hampshire, Virginia, West Virginia - see Figure 1), several of which border on Ontario or Quebec. Significant bat mortality has ensued, estimated at up to over 90% in some locations, with hundreds of thousands dying over the past 2-3 years, and subsequent marked declines in overwintering bat populations. Mortality of this magnitude is very difficult for populations of long-lived animals with low annual recruitment, such as bats, to withstand or recover from, assuming that affected hibernacula will not be lethal environments if re-colonized in the future.

Species involved predominantly are members of the genus *Myotis* (Little Brown Bat, the most abundant species; Northern long-eared Myotis ***M. septentrionalis***; the uncommon Eastern Small Footed Myotis ***M. leibii***; the endangered Indiana Bat ***M. sodalis***), as well as the Eastern Pipistrelle and Big Brown Bat. All of these are known to breed in Canada except the Indiana Bat, though its summer range may extend into eastern Ontario and southwestern Quebec.

White-Nose Syndrome gains its name from the most prominent sign of disease, a powdery white growth on the face of many affected bats (Figure 2). Bats dying of WNS typically are in emaciated body condition, with reduced brown and white fat depots. Many have the characteristic white growth on their muzzle, and in patches on their ears and wings. This is caused by the filamentous hyphae of a fungus, tentatively classified as a member of the genus *Geomyces*. These are a group of cold-loving soil fungi capable of degrading keratin in skin, nails, and hair, and known to occur in caves. The fungus infecting bats grows in the superficial keratinized epithelial layers of the skin, causing a scurfy appearance, but also invades the underlying connective tissue of the skin around hair follicles and associated sweat and sebaceous glands.

It is unclear if this fungus is a primary pathogen, or whether perhaps it is a secondary invader, reflecting an underlying problem with immunocompromise in the host. The possibility of widespread exposure to toxic contaminants, predisposing to opportunistic fungal infection at multiple localities, has not been substantiated.

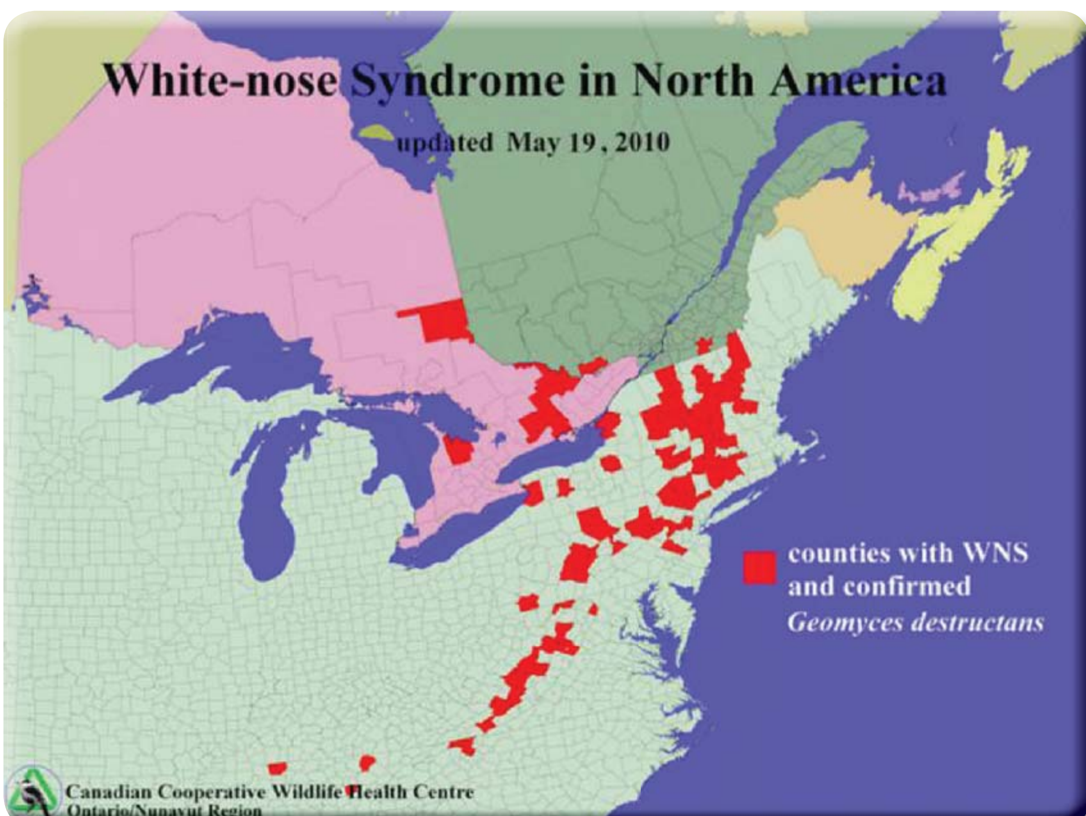

FIGURE 1: Counties in USA and Canada with bat hibernacula in which Bat White Nose Syndrome has been observed and the presence of Geomyces destructans has been confirmed. Leonard Shirose, CCWHC.

FIGURE 2. A Little Brown Bat with White Nose Syndrome. Note the characteristic pale downy-to-powdery deposit around the muzzle. Leonard Shirose, CCWHC.

Bats affected by WNS appear to have abnormal and more frequent arousal from hibernation. While aroused, they may shift locations in the hibernaculum, or emerge prematurely, flying about and dying outside the hibernaculum during winter. The energy demands of arousal from torpor in animals that weigh less than 20 grams are considerable, and cannot be sustained repeatedly without food, which is unavailable. This likely explains the depletion of fat depots and emaciation typical of dead bats with WNS. Exhaustion of energy reserves and hypothermia are probably the major causes of death, and may explain reduced capacity to arouse from deep torpor seen in some sick bats. Whether the fungal infection causes increased arousal and depletion of fat depots, or whether it is an opportunistic pathogen in animals stressed by abnormal arousal is not known.

Several factors support the possibility that the fungus is a primary pathogen. Molecular genetic studies indicate that strains of fungi isolated from bats dying in separate and often geographically distant hibernacula are virtually identical. This suggests that a single strain of the organism has been disseminated from hibernaculum to hibernaculum, which is supported by the temporo-spatial pattern of apparent spread from an epicentre west of Albany NY since 2006. Were the fungus an opportunist, infecting animals predisposed by environmental factors adversely affecting bats over a wide area, strains endemic to each hibernaculum would be expected to vary genetically from each other.

It is probable that the fungus implicated in WNS has been translocated between hibernacula by infected bats, since the condition has occurred in sites closed to human access. While there is no evidence that the fungus involved affects people, cavers and others entering hibernaculums and moving among them may inadvertently translocate it. Since the organism inhabits soil, the risk of translocation by people persists even when there are no bats in a hibernaculum.

At present, activity in the United States is directed mainly at documenting the distribution of WNS; determining the cause of the problem, specifically, the role of the fungus; evaluating the relationship among WNS, body fat depots and arousal from hibernation; and minimizing the possibility of further translocation of the fungus by people.

Affected hibernacula in New York State occur within 50km of Ontario, Canada. This prompted surveillance for WNS in Ontario cave bats, funded by the Ontario Ministry of Natural Resources. Ontario hibernacula (7 caves; 5 abandoned mines) within ~100-450 km of the nearest known WNS-endemic site in New York were investigated between March and May, 2009. Muzzle and wing lesions resembling WNS were observed on ~10/80 live *Myotis* spp. bats at one cave, and on ~100/15,000 at one abandoned mine. Seventeen bats from the two affected sites were suitable for histopathology and mycology. In some animals, mild dermatitis, in several cases associated with fungal elements in the epidermis, was evident histologically. However, spores characteristic of *G. destructans* were not seen histologically or on fungal tape lifts, nor was *G. destructans* isolated. PCR and fungal culture for *G. destructans* in tissue from WNS-suspect bats, carried out at the USGS-National Wildlife Health Center, also failed to detect *G. destructans*. Conclusive evidence of WNS, in the form of the putative etiological agent, was not confirmed in Ontario in 2009.

Active and passive surveillance for WNS was intensified in winter/spring 2010, resulting in detection of *Myotis* spp. of bats with gross and microscopic lesions characteristic of WNS in five hibernacula, most of them in eastern Ontario, and in bats day-flying during winter-early spring from three additional localities. *Geomyces destructans* was isolated from 23/52 bats, and it was demonstrated by PCR in 21/21 bats tested. In the course of one year, WNS became widespread in *Myotis* hibernacula known in eastern Ontario, in several of which it affected up to half the bats observed, although major mortalities were only recognized among bats day-flying in winter/early spring before the availability of prey insects. It was detected over 560km from the nearest known affected hibernaculum in New York State, and in bats using a hibernaculum from which people were physically excluded, suggesting that it was disseminated considerable distances by affected bats. The rapid spread and high prevalence of the syndrome north of its former range in the USA are cause for marked concern about *Myotis* populations in southern and eastern Canada.

WNS has also been confirmed in 2010 at two locations in Quebec by researchers from the Ministere de Ressources Naturelles et Faune and the CCWHC laboratory at the Universite de Montreal.

It is important that bat researchers and cavers are fully aware of the issue, and of the risk of translocating the fungus implicated in WNS. If it is necessary to visit hibernacula, disturbance to hibernating bats must be minimized, and strict precautions must be taken to prevent translocation of the fungus on clothing, footwear and equipment. To the extent feasible, human access to hibernacula should be restricted, and where physical barriers to people are not in place, they should be considered. The environmental consequences of the loss of large numbers of bats are substantial, in terms of insect biomass not consumed, and risk to uncommon species.

Members of the public, biologists and researchers anywhere in Canada who encounter sick and dead bats at any time of the year are encouraged to submit them directly to their Regional CCWHC Centre for diagnostic investigation, provided that there has been no direct human exposure to a possibly rabid animal (i.e. low likelihood of a bat bite). Rabies testing is part of the diagnostic work-up on most bats submitted to CCWHC for determination of cause of death, but a variety of other causes of death are also sought. Telephone in advance for consultations, shipping instructions etc.; shipping may be subsidized by some CCWHC Regions.

Contact points (email addresses; telephone numbers, including toll-free numbers) for the CCWHC Regional Centres, and downloadable submission forms are found on the CCWHC website at http://www.ccwhc.ca/en/contact_info.php

The author acknowledges generous consultations by Alan Hicks, New York State Department of Environmental Conservation; Drs Carol Meteyer and David Blehert, National Wildlife Health Center, US Geological Survey; and Dr. Julien Mainguy, Ministère des Ressources naturelles et de la Faune, Québec. Drs. Cheryl Massey and Doug Campbell provided valuable comments, and Leonard Shirose prepared the map.

White-Nose Syndrome of Bats - Resources

van Zyll de Jong, C.G. 1985. Handbook of Canadian Mammals. 2. Bats. National Museum of Canada, Ottawa. 210 pp.

US Fish & Wildlife Northeast Region WNS site:
http://www.fws.gov/northeast/white_nose.html
Comprehensive, up-to-date; photos; links to sites from affected states; information for cavers; disinfection protocols

US Geological Survey, National Wildlife Health Center:
http://www.nwhc.usgs.gov/disease_information/whitenose_syndrome/
Photos, numerous links, including to the following paper in Science: Blehert, D.S., A.C. Hicks, M. Behr, C.U. Meteyer, B.M. Berlowski-Zier, E.L. Buckles, J.T.H. Coleman, S.R. Darling, A. Gargas, R. Niver, J.C. Okoniewski, R.J. Rudd, W.B. Stone. 2009. Bat White-Nose Syndrome: An Emerging Fungal Pathogen? Science 323: 227.

American Caver's web site:
http://www.caves.org/grotto/dcg/white nose.html
Up-to-date information on distribution of WNS; useful links

Editor's note: WNS is a significant disease that could impact rabies levels in Ontario. Little brown and big brown bats are the species most commonly diagnosed rabid and they are also two of the species most affected by WNS.

dRIT - a report on direct rapid immuno-histochemical testing

Peter Bachmann, RRDU, MNR

To validate that an animal has rabies the rabies virus, most commonly found in the brain, must be isolated and identified using standardized laboratory procedure. Prior to modern laboratory diagnostic techniques the identification of rabies depended solely on clinical signs (e.g., biting, foaming at the mouth, unusual behaviour). One of the first laboratory methods applied histo-pathological staining to detect revealing inclusions, known as Negri bodies, evident in brain tissue of rabid animals. More sophisticated diagnostic procedures, such as mouse-inoculation, cell-culture virus isolation, rapid rabies enzyme immuno-diagnosis and electron-microscopy followed. Developments such as the monoclonal antibody test (late 1970s) characterizing antigenic variants and molecular biology (late 1980s) to differentiate genetic variants advanced the understanding of the rabies virus. The 'traditional' standard, almost universally used, is the **direct Fluorescent Antibody Test (dFAT)**, which was modified for

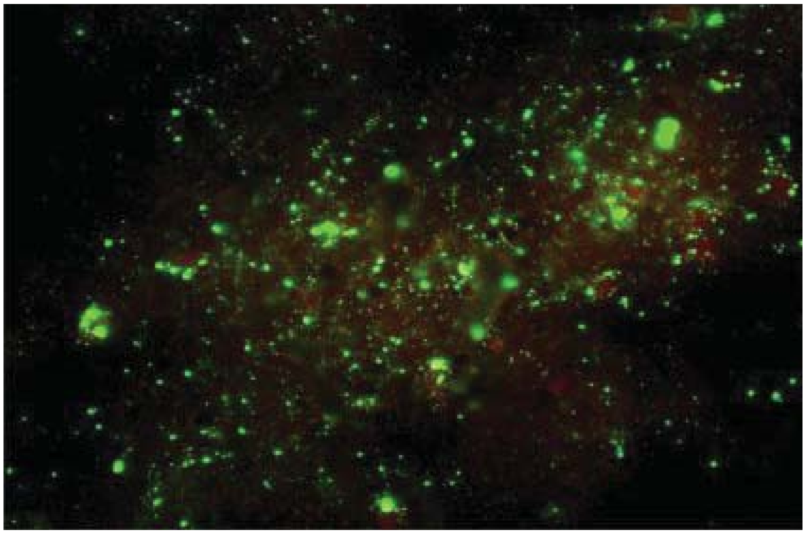

Figure 3. Micro-image of fluorescing particles – an indication of rabies virus in a skunk brain – using the direct Fluorescent Antibody Test (dFAT)

rabies diagnostics in the late 1950s. The dFAT consists in detecting the presence of rabies virus by "allowing fluorochrome-labelled antibody to react with specific antigens, if present, and observing the product of the reaction under a fluorescence microscope" (Figure 3). The dFAT, proven reliable and fast, is the primary tool used by Canadian Food Inspection Agency (CFIA), which is the federal agency mandated to rabies diagnostics in Canada. CFIA uses dFAT mostly in passive surveys (responses to biting or contact incidents) to provide human and veterinary health resolutions (vaccination and quarantine) and collect rabies incident data to evaluate spatial and temporal distribution, and epizootiological indices of the disease. From 1970s to the present CFIA also used dFAT on fox (*Vulpes vulpes*), skunk (*Mephitis mephitis*) and raccoon (*Procyon lotor*) specimens collected in active surveys by Ontario Ministry of Natural Resources (MNR) Rabies Research and Development Unit (RRDU).

DIRECT RAPID IMMUNO-HISTOCHEMICAL TEST (dRIT)

The aforementioned procedures often necessitate advanced laboratory training (e.g., cell-culture techniques) and/or require expensive equipment (e.g., fluorescent microscope). In general those techniques are directed to sophisticated research protocols or used mainly in response to public health matters. A new rabies diagnostic tool, direct Rapid Immuno-histochemical Test (dRIT), was developed since 2000 by Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, USA.

The dRIT uses concentrated biotinylated monoclonal antibodies targeted to the nucleocapsid of the rabies virus. After incubation with an enzyme complex conjugated to a substrate-chromogen, the antibody reagent is made visible, demonstrating a magenta colour, indicating the presence of rabies virus. The monoclonal antibodies that are used in dRIT are non-specific and recognize all variants of the rabies virus. Furthermore, a number of studies have shown that dFAT and dRIT produce the same results: …."Compared to the direct fluorescent antibody test, the traditional standard, the dRIT was 100% sensitive and specific". The dRIT procedure requires assessable chemical reagents and uses contemporary histochemical staining techniques, and analysis is with a light microscope. Since the materials and techniques are relatively simple, basic laboratory training (1 to 2 days) is all that it takes for field and technical staff to master dRIT.

The dRIT is an unlicensed test and should not to be used with respect to rabies diagnostics concerning human or veterinary health matters. This must remain within the realm of dFAT, and, perhaps, other enhanced tests mentioned above, and the respective regulatory agency, that being the federal CFIA in Canada. The dRIT may, however, be applied in surveillance programs where human and veterinary health issues are inconsequential.

RABIES SURVEILLANCE – ACTIVE AND PASSIVE

In active surveys samples of a particular specimen are collected directly and randomly by researchers or co-operators to determine a particular index (or trait) of a large group or population (e.g., age, sex, size, food habits, health status, disease, etc.). Generally active surveys are pre-planned, standardized, and occur over a very specific time period and region. In passive surveys researchers do not collect specimens directly, but rely on non-researchers to provide them; in the case of rabies surveys, the general public notifies CFIA. For rabies the submission criteria to passive surveys are commonly understood traits (usual behaviour, foaming at the mouth) and events (being bitten, coming in contact) easily interpreted by the non-researcher. In addition, passive surveys are usually temporally and regionally non-specific; the collection occurs only when and where the particular criteria occur.

In the past (1970-90) active surveys by RRDU have provided an index of rabies cases in asymptomatic animals in the existing wild population: 1 to 2% of foxes and skunks were diagnoses rabid (dFAT) when rabies was enzootic in Ontario, and declined rapidly with extensive oral rabies vaccination programs (ORV) to 0%. The passive surveys (direct public submissions to CFIA) provided an acute management-orientated index of rabies foci in specific areas with substantial human populations, like southern Ontario, because they rely on reports of people coming in direct contact with symptomatic animals: the more rabid animals the more potential contacts. Some of those indices attained 80 - 85% rabies positives during 'outbreaks' in the southern Ontario enzootic (1970 to 1990). Passive surveys might be less likely to respond to areas of rabies decline, to remote (low-population) areas or to suspect animals that do not meet the submission criteria. In Ontario dRIT could be beneficial when used in active surveys of post-ORV evaluations, to screen areas vulnerable to rabies foci such as sites bordering New York State (raccoon rabies) and in remote areas (Northern Ontario) (Figure 2), or to assess individual suspect animals that do not meet the criteria for submission to CFIA.

THE dRIT TRAINING

In 2006 or 2010 technical staff from MNR, federal CFIA, provinces of Quebec, New Brunswick and Newfoundland attended dRIT training sessions given by CDC staff. In 2006 training was held at the CDC facilities in Atlanta and in 2010 training occurred at the CFIA laboratory in Ottawa.

THE dRIT IN ONTARIO

The dRIT was performed on brain samples collected in active surveys of foxes (n= 75) and skunks (n = 28) in 2009 by MNR Wildlife Research and Development Section staff. The samples were collected from trappers and hunters in the southwestern Ontario ORV region, an area experiencing a focus of rabies in skunks. All but one of those samples was considered clearly rabies negative by dRIT. The one sample which showed intensity 2 inclusions at 1 or 2 distribution grade was considered questionable. All the samples were also tested with dFAT by CFIA: all samples tested via dFAT were rabies negative, including the questionable dRIT. Microphotographs of the positive and negative controls used in the dRIT procedure are shown in Figure 4 (positive) and 5 (negative).

In May 2010, a skunk was found dead in southwestern Ontario during a local rabies outbreak. Since there was no obvious human or domestic animal contact with the dead skunk, the specimen was not delivered to CFIA for routine dFAT. That specimen proved to be rabies positive using dRIT, which was subsequently confirmed with dFAT by CFIA.

MNR Wildlife Research and Development Section will continue to actively collect samples throughout Ontario for rabies screening using dRIT for the next 4 to 5 years, particularly in vulnerable areas or ORV program sites. All dRIT rabies positives will be validated via dFAT by CFIA and dRIT by CDC, and 10% of the dRIT negatives from Ontario will be validated via dRIT at CDC.

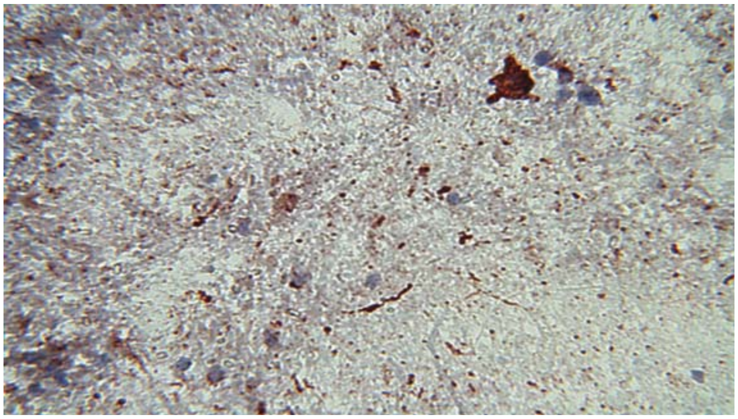

Figure 4. A microphotograph of the rabies positive control showing the typical magenta coloured inclusions – indicative of rabies virus

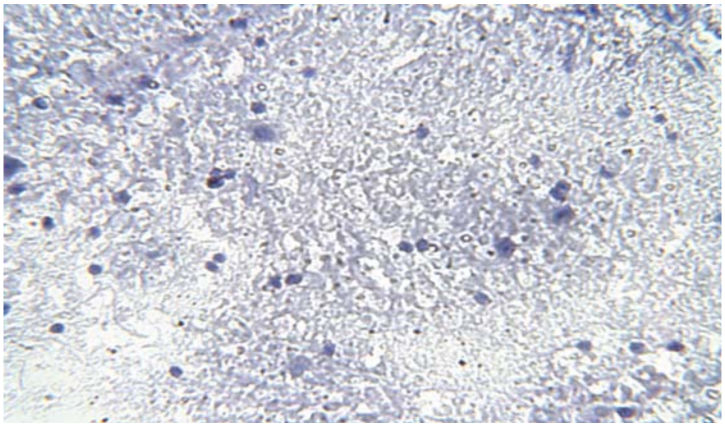

Figure 5. A microphotograph of the negative control sample, counter-stained, with no evidence of the typical magenta coloured inclusions

ACKNOWLEDGEMENTS

Kim Bennett, Tore Buchanan and Andrew Silver did the dRIT on the Ontario samples. Mark Gibson and Andrew Silver took the photographs depicted in this report.

Animal Rabies Report: April to June 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
Eastern																											
Stormont, Dundas & Glengarry																									0	0	0
Prescott-Russell																									0	0	0
Ottawa-Carleton																									0	0	0
Renfrew																									0	0	0
Lanark																									0	0	0
Leeds and Grenville													1	1	1										1	1	1
Frontenac																									0	0	0
Lennox & Addington																									0	0	0
Central																											
Hastings																									0	0	0
Prince Edward																									0	0	0
Northumberland																									0	0	0
Victoria																									0	0	0
Haliburton																									0	0	0
Peterborough																									0	0	0
Durham																									0	0	0
York Region													1	1											1	1	0
Toronto														1											0	1	0
Simcoe													1	1											1	1	0
Western																											
Peel													1	1											1	1	0
Halton																									0	0	0
Dufferin																									0	0	0
Wellington															1										0	0	1
Waterloo													1	1	1									7	1	1	8
Perth																									0	0	0
Grey							6	6																	6	6	0
Bruce			1						3																0	0	4
Huron																									0	0	0

Animal Rabies Report: April to June 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																									0	0	0
Haldimand-Norfolk													1	1											1	1	0
Brant																									0	0	0
Niagara															1										0	0	1
Elgin															1										0	0	1
Oxford																									0	0	0
Middlesex																									0	0	0
Lambton													4	4											4	4	0
Kent																									0	0	0
Essex																									0	0	0
Northern																											
Muskoka																									0	0	0
Parry Sound																									0	0	0
Nipissing																									0	0	0
Sudbury																									0	0	0
Cochrane																									0	0	0
Timiskaming																									0	0	0
Algoma																									0	0	0
Thunder Bay																									0	0	0
Rainy River																									0	0	0
Kenora																									0	0	0
Regional Totals																											
Eastern	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	**1**	**1**	**1**
Central	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	**2**	**3**	**0**
Western	0	0	1	0	0	0	6	6	3	0	0	0	2	2	2	0	0	0	0	0	0	0	0	7	**8**	**8**	**13**
Southern	0	0	0	0	0	0	0	0	0	0	0	0	5	5	2	0	0	0	0	0	0	0	0	0	**5**	**5**	**2**
Northern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Totals	**0**	**0**	**1**	**0**	**0**	**0**	**6**	**6**	**3**	**0**	**0**	**0**	**10**	**11**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**16**	**17**	**16**

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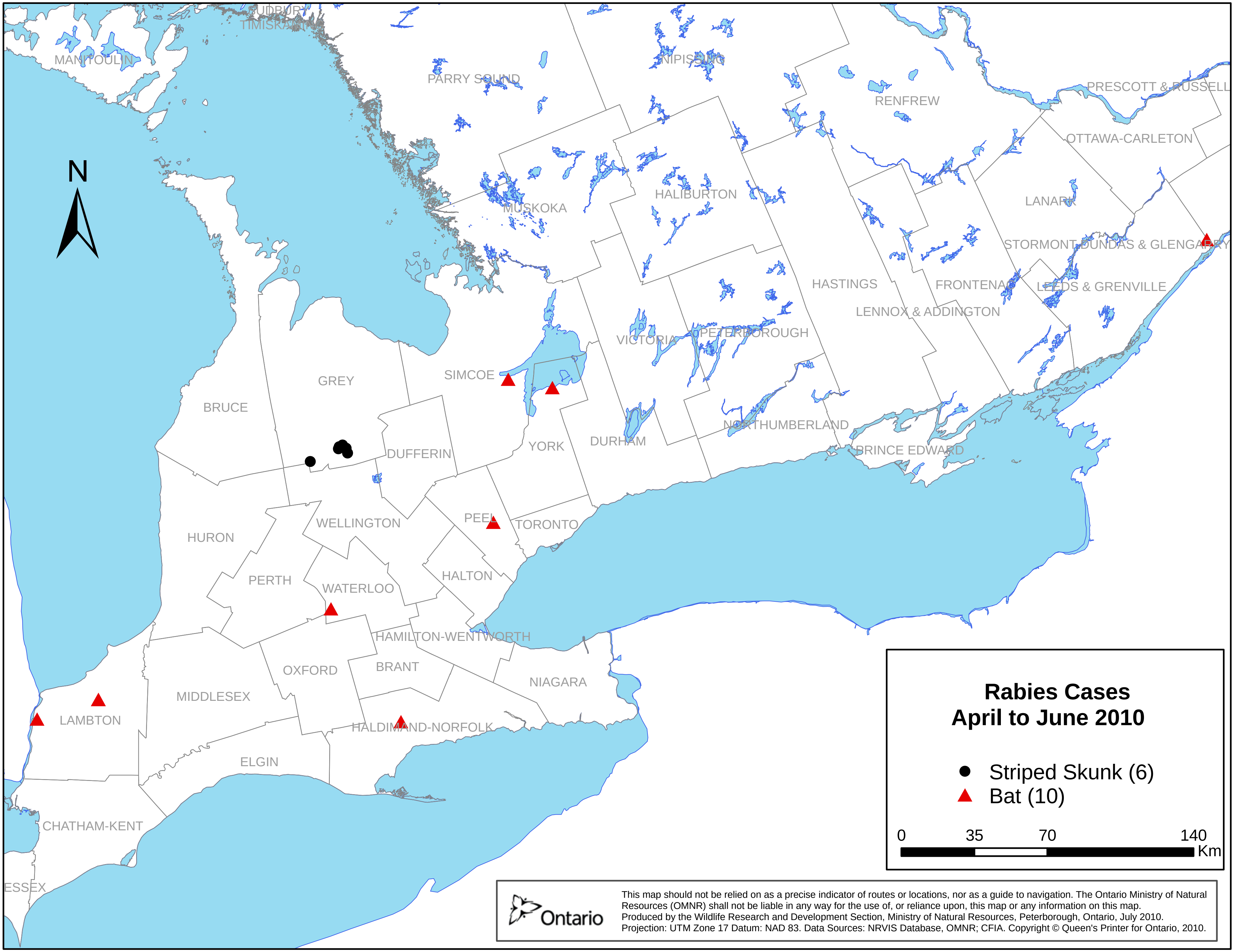
Notes for this quarter: All bats were big brown bats except for the bat from Haldimand-Norfolk which was a little brown bat. Three of the bats from Lambton County were submitted in Hamilton-Wentworth.

Ontario



Rabies Cases
April to June 2010
Striped Skunk (6)
Bat (10)
0 35 70 140
Km
N
SUDBURY
TIMISKAMING
MANITOULIN
PARRY SOUND
NIPISSING
RENFREW
PRESCOTT & RUSSELL
OTTAWA-CARLETON
HALIBURTON
MUSKOKA
LANARK
STORMONT, DUNDAS & GLENGARRY
HASTINGS
FRONTENAC
LEEDS & GRENVILLE
LENNOX & ADDINGTON
VICTORIA
PETERBOROUGH
SIMCOE
GREY
BRUCE
NORTHUMBERLAND
DURHAM
YORK
DUFFERIN
PRINCE EDWARD
PEEL
TORONTO
WELLINGTON
HURON
PERTH
WATERLOO
HALTON
HAMILTON-WENTWORTH
OXFORD
BRANT
NIAGARA
MIDDLESEX
LAMBTON
HALDIMAND-NORFOLK
ELGIN
CHATHAM-KENT
ESSEX
Ontario
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