

Wildlife Research and Monitoring Section  
Ministry of Natural Resources and Forestry

# Ontario Chronic Wasting Disease Surveillance Program

2014-2015 Program Update



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# Program Update

## 2014-2015

Ontario Chronic Wasting Disease Surveillance Program

WILDLIFE RESEARCH & MONITORING SECTION  
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Cover photo: White-tailed deer in a winter forest setting  
Credit: MNRF stock photo

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## Summary

During the 2014 Ontario Chronic Wasting Disease (CWD) surveillance program, a total of **496** white-tailed deer samples were collected and sampled from the Owen Sound-Goderich area. This exceeded our target sample size of 460 samples. The majority of samples were collected during the first week of November 2014 during the gun hunt, with a few also being collected during the early archery season in October. All samples were negative for the presence of CWD. Since the CWD surveillance program began in 2002, 10,417 samples have been analysed. To date, no cases of CWD have been detected in Ontario.

## Introduction

CWD is a fatal disease which infects members of the cervid family. CWD is caused by abnormally folded proteins called prions, which cause lesions on the brain leading to death. The disease is not known to naturally infect any species outside the cervid family. CWD is endemic in several states in the western United States (i.e. Colorado and Wyoming) and has been identified in two western Canadian provinces (Alberta and Saskatchewan). More recently, the disease has also gained footholds in several eastern states (e.g. Wisconsin, Illinois, West Virginia). Currently, CWD is not known to exist in Ontario, but has been discovered in five bordering states: Minnesota (2002), New York (2005), Michigan (2008), Pennsylvania (2012), and Ohio (2014). In the primary infection area of the western U.S., white-tailed deer, elk, and mule deer have been shown to be very susceptible to CWD. A small number of moose have also tested positive for CWD – including a recent case in Alberta (2012).

## Ontario surveillance program background

Due to increasing concern about diseases in Ontario's white-tailed deer and restored elk populations, a surveillance pilot project was initiated in 2002 to determine whether CWD was present in Ontario's wild cervid populations. The *Ontario Chronic Wasting Disease Surveillance* program became operational in 2003.

Surveillance samples are collected during the fall by relying on volunteer participation from hunters. Small crews of MNR staff roam patrol areas in the predetermined surveillance zone - asking hunters for permission to remove a brain and lymph node sample from their harvested deer. Hunters also have the option of dropping off deer heads at depots within the surveillance area.

A sample size of 460, assuming random distribution of samples, is adequate to detect if CWD was present in 1% or greater (99% confidence level) of the population within the surveillance zone. Initially, the province was divided into 14 different CWD surveillance zones prioritized by CWD risk factors. In an effort to speed up the surveillance of the

province, the number of CWD zones surveyed per year was increased from one to three zones per year from 2005-2010. After completion of testing all 14 CWD zones, several factors (new research findings, financial pressure, and maturation of the program) led to the use of a dynamic risk-based surveillance program, and a decrease in the amount of surveillance conducted each year. Instead of following a pre-determined schedule of zones to be tested each year as in the past, a dynamic model was developed to predict highest risk areas of the province annually (Figure 1). The risk inputs used in the new model are (in order of importance): estimated cervid farm density, estimated wild deer density, proximity of neighboring CWD outbreaks, years since last surveillance, restored elk population presence, deer wintering concentrations, and soil type. The model is updated with new data each year to recommend the surveillance area that has the highest risk for that year, which is then used to inform surveillance management decisions.

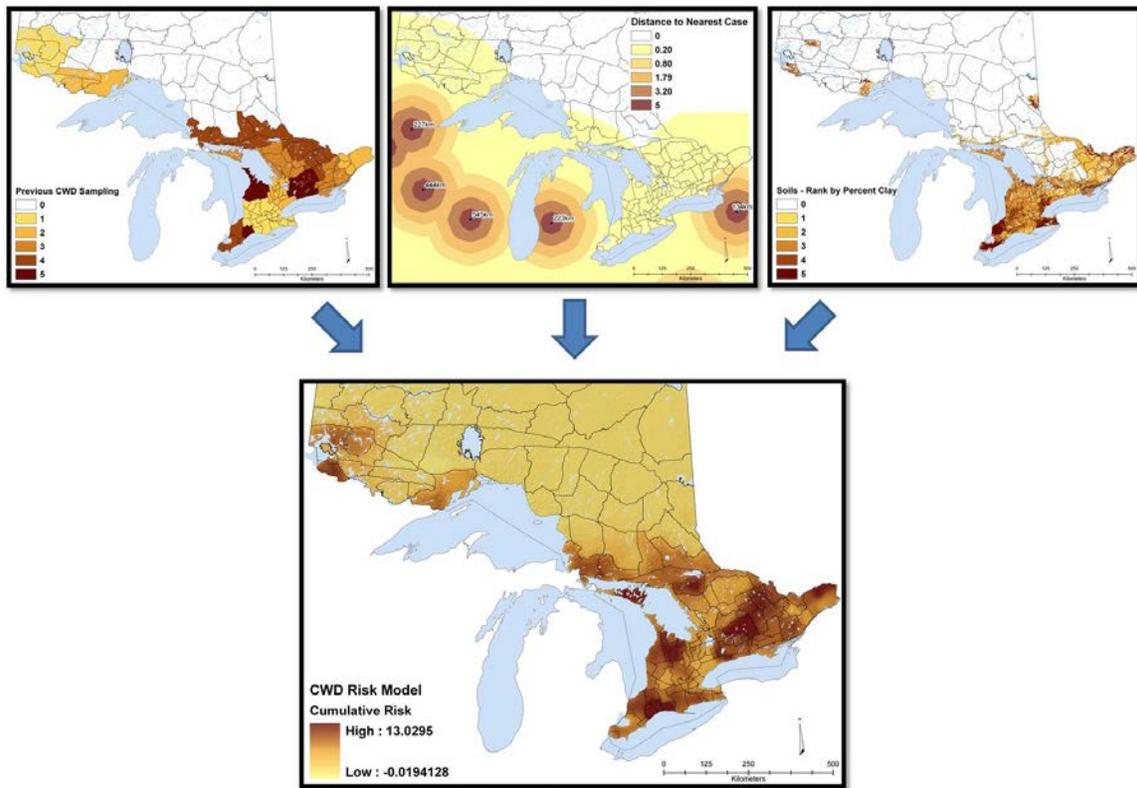


Figure 1. An example of risk layers compiled into an overall spatially-quantified risk assessment.

## 2014 Results

The Ontario CWD risk model identified the Owen Sound-Goderich area as having the highest risk of CWD in 2014 (Figure 2). Accordingly, CWD surveillance in 2014 was conducted in Grey, Bruce and Huron counties which included WMUs 82, 83, 84 and 85 (Figure 3). Freezer depots were established at eight locations throughout the sampling area and were opened in early October so archery hunters could drop off their deer heads. The majority of the samples (89%) were collected by MNRF crews during the first week of the firearm hunt (Nov 3-9, 2014). The remaining 11% of the samples were collected by the depots after the first week of November. A small number of samples (9) were collected at the drop off depots during the October archery hunt. In total, 496 white-tailed deer were sampled and screened for CWD presence (surpassing the target of 460 samples); all tested negative for CWD. All samples were screened for CWD at the Animal Health Lab in Guelph, Ontario using enzyme-linked immunosorbent assay (ELISA) tests. All 496 samples were tested and results posted online by December 12, 2014.

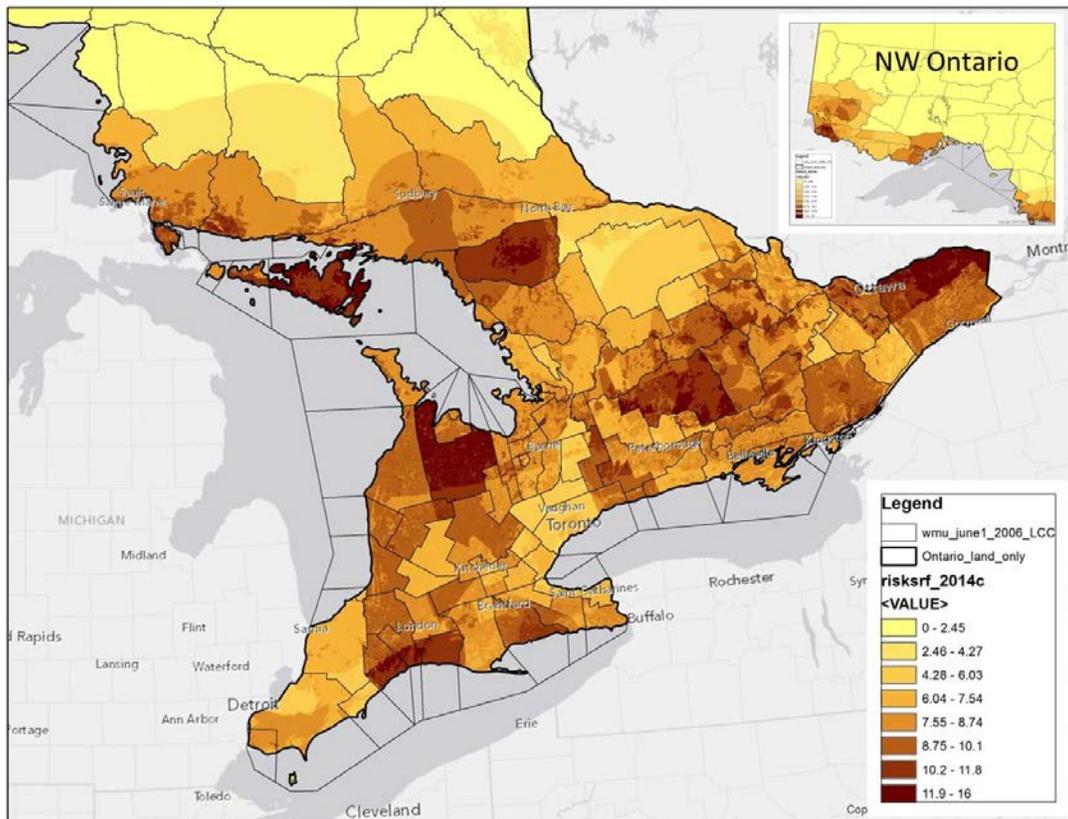


Figure 2. CWD risk model output map for 2014.

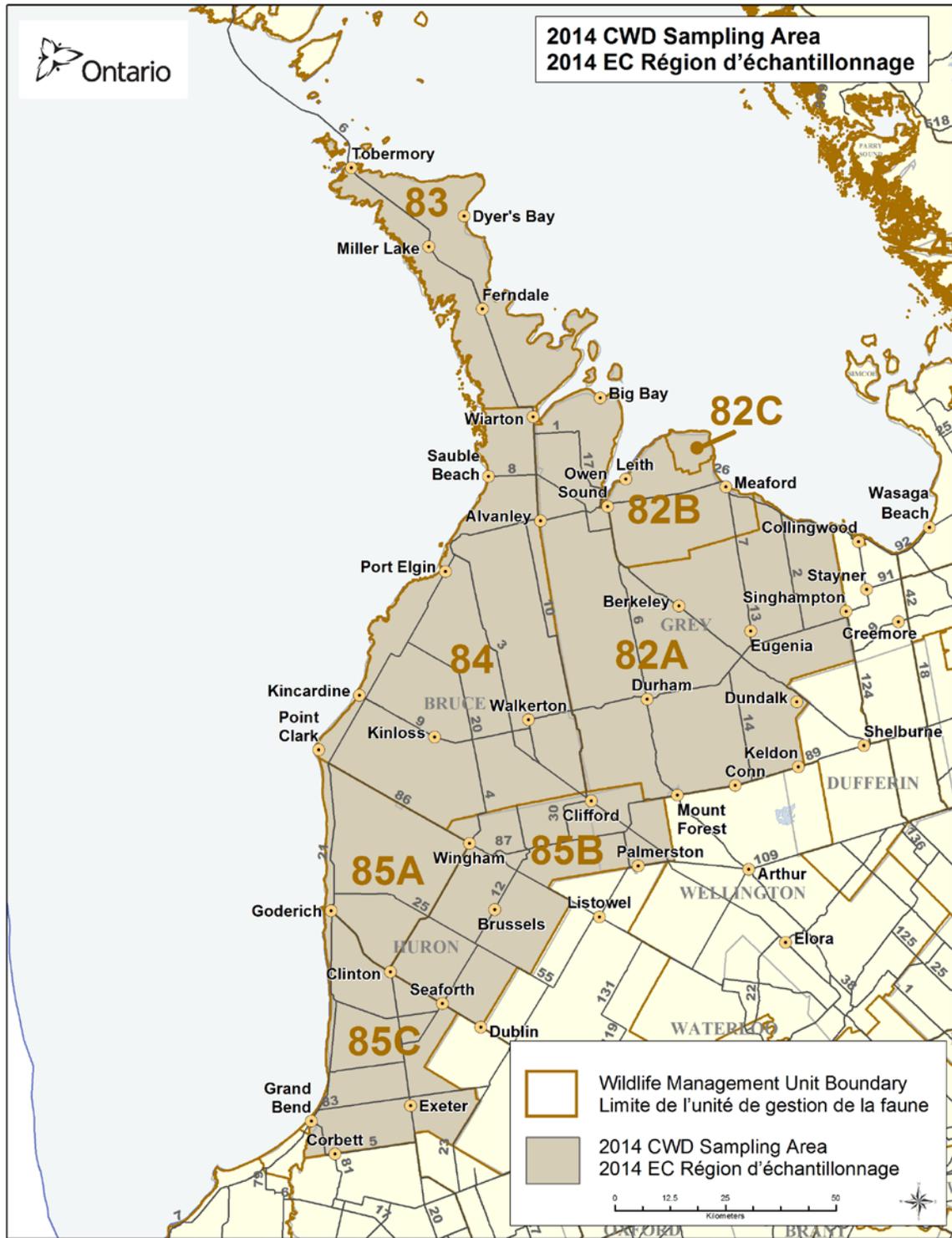


Figure 3. Map of the 2014 CWD surveillance area in southwestern Ontario.

## Other sampling

In addition to our annual surveillance, we also opportunistically test samples from deer that display CWD-like symptoms as reported by the public or MNR offices during any time of the year, from anywhere in the province. Six deer with abnormal behavior or appearance were tested in 2014, one each from; Dryden, Wingham, Stoney Creek, Bon Echo Provincial Park, Owen Sound, and Port Stanley. Post-mortems on these animals were performed by the Canadian Wildlife Health Cooperative (CWHC) in Guelph, Ontario. All six animals tested negative for CWD. Suspected causes of abnormal appearance or behavior were: undetermined, previous hunting injury, undetermined, herniated diaphragm, undetermined and carbohydrate/grain overload respectively. An additional six white-tailed deer that were seized by conservation officers in two separate instances of illegal importation from outside of Ontario also tested negative for CWD. Since 2009, 27 cervids displaying abnormal, CWD-like behavior have been necropsied and tested for CWD (Figure 4).

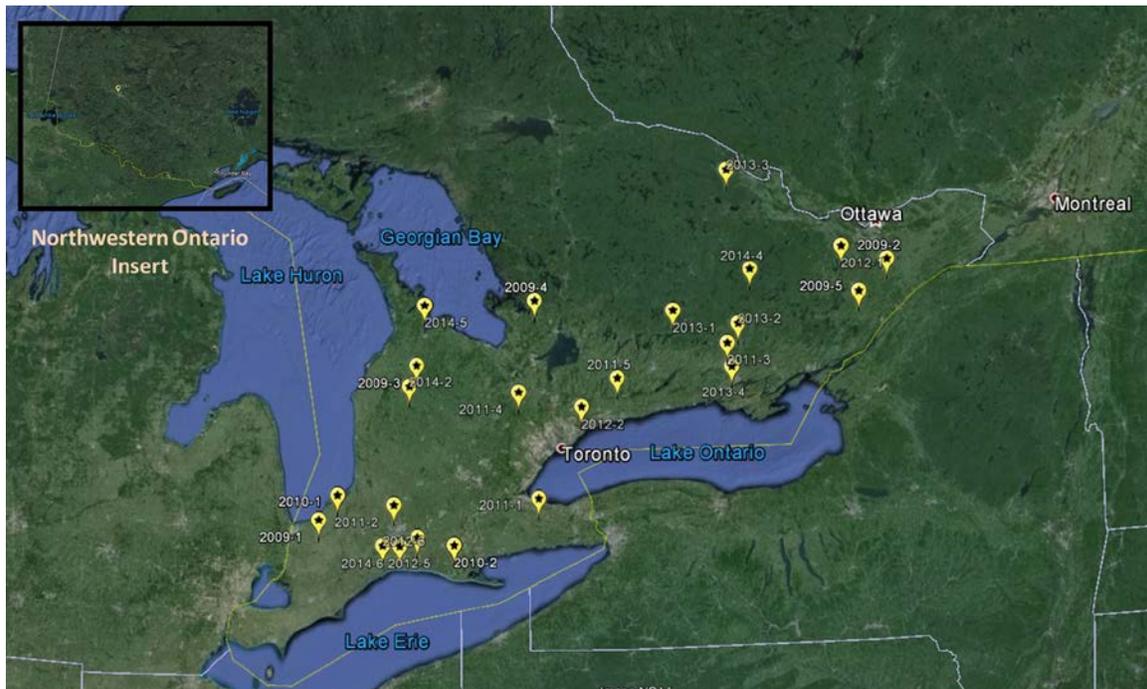


Figure 4. Testing of cervids displaying abnormal or CWD-like symptoms in Ontario since 2009.

## Program results to date

This was the 12th operational year of the CWD surveillance project. All significantly populated deer inhabited areas of the province have been tested at least once, and many of the highest priority areas have been tested two or three times. To date, 10,417 wild cervids (10,405 white-tailed deer and 12 elk) have been tested for CWD during regular surveillance (Table 1).

Table 1. Numbers of surveillance samples collected per year in Ontario.

Year	Surveillance area	WMU's	Deer tested
2002	Owen Sound-Hanover	82, 84 (pilot year)	183
2003	Ottawa-Cornwall	64, 65, 66	471
2004	Toronto-Barrie	76, 77, 78B-E, 81	427
2005 <sup>1</sup>	Guelph-Goderich	79C, 80, 85, 86, 87A, 87C	269
2005 <sup>1</sup>	London-Niagara Falls	79D, 87B, 87D-E, 88, 89, 90, 91, 92	467
2005 <sup>1</sup>	Kingston-Brockville	62, 66A, 67, 68B, 69	500
2006 <sup>2</sup>	Kenora-Fort Frances	5, 6, 7, 8, 9, 10, 11A	491
2006 <sup>2</sup>	Lindsay-Peterborough	60, 71, 72, 73, 74, 75, 78A	520
2006 <sup>2</sup>	Owen Sound-Hanover	82, 83, 84	371
2007	Pembroke-Bancroft	48, 51, 55, 57, 58, 61	393
2007	Windsor-Sarnia	93, 94	249
2007	Sault Ste. Marie-Sudbury	36, 37, 38, 39, 45	239
2008	Kingston-Lanark	59, 62, 63, 67, 68, 69, 70	487
2008	Manitoulin	43, 44	480
2008	Parry Sound-North Bay	42, 46, 47, 49, 50, 53, 54, 56	521
2009	Thunder Bay-Ignace	11B, 11C, 12, 13, 14, 28	110
2009	Ottawa-Cornwall	64, 65, 66	349
2009	Toronto-Barrie	76, 77, 78B-E, 81	298
2010	Guelph-Goderich	79C, 80, 85, 86, 87A, 87C, 92A	518
2010	London-Niagara Falls	79D, 87B, 87D-E, 88, 89, 90, 91, 92D	513
2010	Kenora-Fort Frances	5, 6, 7, 8, 9, 10, 11A	362
2011 <sup>3</sup>	Peterborough-Bancroft	57, 60, 74, 75	495
2012	London-Sarnia	90B, 92, 93	488
2013	Pembroke-Mattawa	48, 55, 58, 59, 63	495
2014	Owen Sound-Goderich	82, 83, 84, 85	496
<b>Total</b>			<b>10,417</b>

<sup>1</sup>An additional 175 samples were collected in 2005, but not recorded from which zone.

<sup>2</sup>An additional 50 samples were collected in 2006, but not recorded from which zone.

<sup>3</sup>Twelve of the 2011 samples were wild elk harvested from the 2011 elk hunt.

Sampling in Ontario is confined to areas that are populated with deer at medium to high population densities. Much of northern Ontario either contains very low or no deer populations. Sampling is therefore confined to southern, central and northwestern Ontario. In southern Ontario, the sampling has been relatively even in distribution (Figure 5), but with high concentrations in southeastern and southwestern Ontario where some WMUs have been sampled three times. Some areas (i.e. Windsor) may appear to have had little or no sampling, but this is mostly because of different methods

of location data (townships vs. bird breeding squares) being collected in those areas, and thus not displayed on the map. The only areas of southern Ontario that have not received adequate sampling have been around the Greater Toronto Area (GTA) and Algonquin Provincial Park. This is due to lack of deer hunting in the former and hunting restrictions in the latter. In northwestern Ontario, sample distribution is primarily a factor of suitable deer habitats and is focused around the Thunder Bay, Fort Frances, Dryden and Kenora areas.

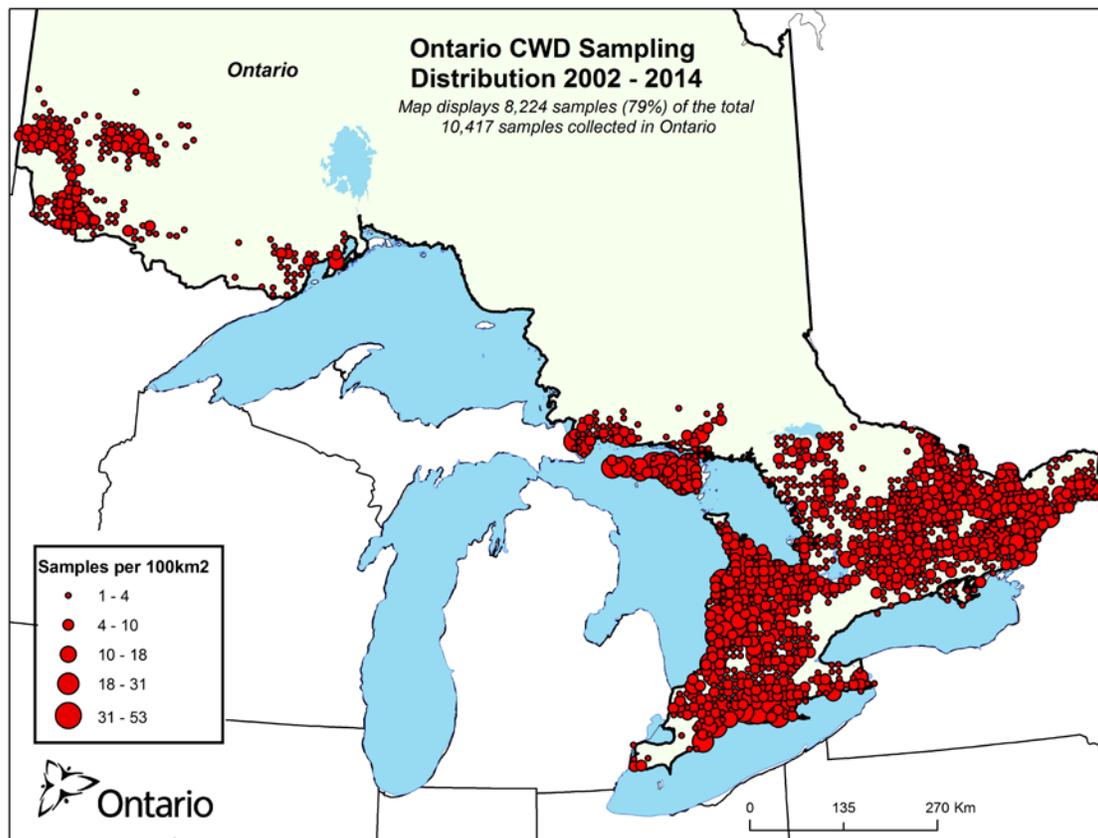


Figure 5. CWD sample distribution in southern and northwestern Ontario. The map only displays 79% of the total samples tested.

### Neighbouring jurisdictions

All five U.S. states that share a border with Ontario have detected CWD (Figure 6). New York State has not discovered any further cases of CWD since their initial 7 cases were detected on a cervid farm in 2005 near Syracuse (130 km south of the Ontario border near Kingston). The CWD containment area restrictions were lifted in 2010 after extensive testing over six years turned up no new cases.

Minnesota discovered their first case of CWD in a wild deer in 2010 in the southeast part of the state and initiated the implementation of a CWD management zone in an area of approximately a seven mile radius of the case. Over four thousand deer were tested for

CWD in that area and all tested negative for CWD. It appears the Minnesota response may be another successful example of vigorous surveillance, early detection and rapid response preventing further CWD spread. The Minnesota wild deer case was approximately 450 km south of the border in northwestern Ontario.

Michigan diagnosed a case of CWD on a game farm in 2008 near the city of Grand Rapids (220 km west of the Ontario border at Windsor). A containment area was established in the townships around the game farm, and extensive testing did not discover any further cases. In May 2015, a free-ranging deer near Lansing, Michigan was Michigan's first confirmed case of CWD in a wild deer. This case is located about 100 km east of the previous case and about 120 km west of Windsor. As of late June 2015, 192 deer from the CWD containment area had been tested for CWD; all have tested negative.

Pennsylvania discovered their first cases of CWD in 2012 in two different locations of the state. Several cases were detected on game farms in the southeast part of the state (near Harrisburg) and three cases were detected in wild deer shot during the 2012 hunt in the south-central part of the state (120 km east of Pittsburgh). In 2013, another case was discovered in a hunted wild deer from the south-central outbreak area of the state. In September 2014, an adult white-tailed deer that died on a game farm 120 km northeast of Pittsburgh triggered the establishment of a third CWD deer management area in Pennsylvania. This case is located about 200 km south of the Ontario border at Fort Erie, and is considered to be the source of the recent CWD case on an Ohio game farm. It is believed that there are currently over 1,000 cervid game farms operating in the state of Pennsylvania.

Ohio announced their first case of CWD in the state in October 2014 on a game farm located in the NE part of the state (100km south of Cleveland). The farm had previously been under quarantine since April 2014 after an investigation determined that the farm had a known connection with game farm that tested positive for CWD in Pennsylvania. Recently, in March 2015, a second case of CWD was diagnosed in Ohio from the same game farm owner on a nearby game farm property.

Ontario's Canadian neighbours (Quebec and Manitoba) continue to remain free from CWD detection and have active ongoing surveillance programs.

At a broader scale, there are two large outbreaks of CWD in eastern North America (Figure 6). A very large outbreak in the southern Wisconsin-northern Illinois border area has persisted and grown since 2002. More than 3,300 cases of CWD have been detected in this area since 2002. It has been estimated that 25% of adult male deer in the core southwestern outbreak area are currently infected with CWD. This outbreak area is approximately 550 km west of the Ontario border at Windsor. The second, more recent outbreak area is in the West Virginia-Virginia-Maryland-Pennsylvania area. It is a smaller

area with lower prevalence rates but is probably spreading. This outbreak area is centred approximately 400 km southeast of the Ontario border at Niagara Falls.

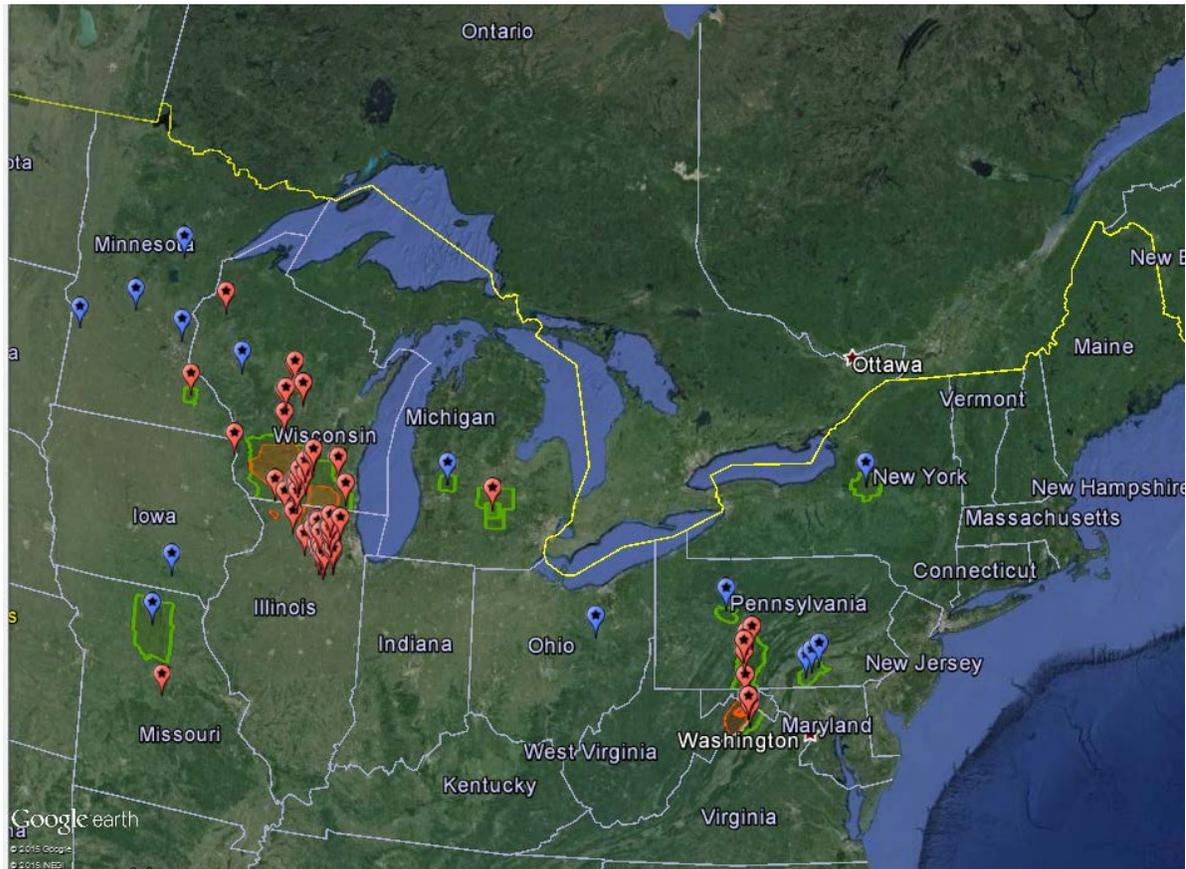


Figure 6. Broad-scale map of CWD incidence in eastern North America. Red markers are cases of CWD in wild white-tailed deer, blue markers are CWD cases detected on game farms. Orange polygons are large outbreaks of CWD with numerous cases; green polygons are state implemented CWD containment zones.

## Acknowledgements

We would like to thank our 2014 depot locations and cooperating butchers for all assistance provided: Elder Enterprises, Ferndale UPI Gas Station, Grey County Meats, J-Mar Meats, Lake Huron Rod and Gun Club, Outback Sports, Rack 'n' Roost hunting shop, and Watson's Tackle House.

The staff at the Animal Health Lab in Guelph have processed our samples for the past thirteen years with rapid results and professional service. The staff at the Canadian Wildlife Health Centre also in Guelph have performed post-mortem inspections on suspicious deer and coordinated CWD testing for these deer.

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MNRF staff Charlotte Hooper from Fish and Wildlife Services Branch coordinated hunter information mail-out packages. Freya Long, also of Fish and Wildlife Services Branch, coordinated website updates and assisted with communications. Chris Heydon from Biodiversity Branch developed and maintained MNRF's CWD policies, and CWD response plan document. MNRF regional biologists Brad Allison, Mike Gatt, and Peter Davis provided regional expertise and advice. Zaur Aliyev of Communication Services Branch posted test results online.

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MNRF Wildlife Research and Monitoring Section staff Kevin Middel and Val von Zuben created maps and maintained the databases for the program. Kevin Middel was an integral developer of the Ontario CWD risk model and updates the model annually. Beverly Stevenson organized advertising campaigns, media requests and internal communications and approvals. Mark Gibson leads the surveillance crews and depot locations, sample logistics, and supply management. Bev Stevenson, Chris Davies, Mark Gibson, Bob Watt, and Dennis Donovan reviewed this report.

Crew leader: Mark Gibson. Crew staff: Kim Bennett, Steve Bennett, Derek Lipskie, Gord Meadows, Larissa Nituch, Zack O'Krafka, Andrew Orton, Mike Parna, Matt Purvis, Jenny Rodgers, Bev Stevenson, Sue Tully, Al Winters, and Katrina Wisniewski.

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