



# Ontario Chronic Wasting Disease Surveillance 2020 Program Update

Wildlife Research and Monitoring Section

# Ontario Chronic Wasting Disease Surveillance 2020 Program Update

Prepared by: Ayden Sherritt and Larissa Nituch

March 2021

Enquiries about this publication can be directed to:  
Wildlife Research and Monitoring Section, Ontario Ministry of Natural Resources and  
Forestry DNA Building, Block B, 2nd Floor, Trent University  
2140 East Bank Drive, Peterborough, ON K9L 0G2

Telephone: (705) 313-2043 Fax: (705) 755-1559  
Email: [larissa.nituch@ontario.ca](mailto:larissa.nituch@ontario.ca)

## Contents

Summary .....	4
Introduction .....	4
Ontario surveillance program background .....	5
Figure 1. Example of layers used in risk assessment. ....	6
2020 Results.....	7
Figure 2. Modelled risk of CWD in Ontario for 2020. ....	7
Figure 3. 2020 CWD surveillance zone in southwestern Ontario.....	9
Figure 4. 2020 CWD surveillance zone in eastern Ontario.....	9
Other sampling.....	10
Figure 5. Locations of cervids displaying abnormal or CWD-like symptoms tested in Ontario since 2009.....	10
Program results to date.....	11
Table 1. Surveillance samples collected per year in Ontario.....	11
Figure 6. CWD sample locations in Ontario between 2002 and 2020. ....	13
Neighbouring jurisdictions .....	13
Figure 7. Incidence of CWD in eastern North America from 2008 to 2020. ....	14
Regional summaries .....	14
Adjacent Canadian provinces .....	16
European and Asian cases.....	16
Acknowledgements .....	18

# Summary

Ontario's 2020 chronic wasting disease (CWD) surveillance program occurred in both southwestern Ontario in the seven wildlife management units (WMU) between Windsor, Sarnia and St. Thomas (WMUs 94A, 94B, 93A, 93B, 93C, 92B, and 92C), and in WMU 65 in eastern Ontario. This was the fourth year in a row MNR staff conducted surveillance in eastern Ontario, conducting regular surveillance in 2017, and returning from 2018 to 2020 in response to positive cases of CWD identified on a game farm in western Québec in 2018, 15 km from the Ontario- Québec border (near Hawkesbury, Ontario). In 2020, a total of 742 samples were collected and tested (208 white-tailed deer and one red deer sample from eastern Ontario, and 533 white-tailed deer samples from the southwestern surveillance zone). CWD was not detected in any of the samples tested. Since the CWD surveillance program began in 2002, 13,667 samples have been analyzed. To date, no cases of CWD have been detected in wild cervid populations in Ontario.

## Introduction

CWD is a fatal disease that infects members of the cervid (deer) family. White-tailed deer (*Odocoileus virginianus*), elk (*Cervus canadensis*), and mule deer (*Odocoileus hemionus*) have been shown to be very susceptible to CWD and several moose (*Alces alces*) have also tested positive for the disease. The disease is not known to naturally infect species other than those in the cervid family. The disease is caused by abnormally folded proteins called prions which cause brain lesions leading to death. CWD has been identified in 26 U.S. states and three Canadian provinces (Alberta, Saskatchewan and Québec) and is now considered endemic in several states in the west (i.e., Colorado and Wyoming) and mid-west (i.e., Wisconsin and Illinois). Since 2003, it has also become established in several eastern U.S. states (e.g., Pennsylvania, Maryland, West Virginia). Currently, CWD is not known to exist in Ontario but has been discovered in Québec (2018) and all five bordering states: Minnesota (2002), New York (2005), Michigan (2008 in captive animals, 2015 in free-ranging animals), Pennsylvania (2012), and Ohio (2014).

# 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 fully operational in 2003.

Each year, surveillance samples are collected during the fall hunting season. Crews of Ministry of Natural Resources and Forestry (MNRF) staff rove throughout the surveillance areas, asking hunters for permission to remove two lymph nodes and a brain sample from their harvested deer. Hunters also have the option of dropping off their deer heads at depot locations set up within the surveillance area for testing. Depots are businesses or individuals who are associated with deer hunting (e.g. butchers, hunting supply stores etc.), who agree to house a freezer and collect data for each head submitted.

In 2003, the province was divided into 14 CWD surveillance zones prioritized by identified risk factors, and one zone was surveyed each year. Between 2005 and 2010, the number of CWD zones surveyed was increased from one to three zones per year. In 2010, when surveillance of all 14 CWD zones was complete, several factors (new research findings, financial pressure, and maturation of the program) led to the development and use of a dynamic risk-based surveillance program, and a decrease in the number of surveillance zones monitored each year. Rather than following a pre-determined schedule of zones to be tested each year (as in previous years), the new model was used to predict the highest risk areas of the province and to inform the decision on where to target annual surveillance (Figure 1). Risk inputs used in the Ontario CWD risk model are (in order of importance):

1. game farms/zoos and neighbouring CWD cases/outbreaks,
2. deer and elk density,
3. prior sampling effort,
4. unstudied elk/red deer populations,
5. deer aggregation areas and
6. winter severity.

Each year, new data are input to determine the areas with the highest risk, which informs the choice of surveillance areas for that year.



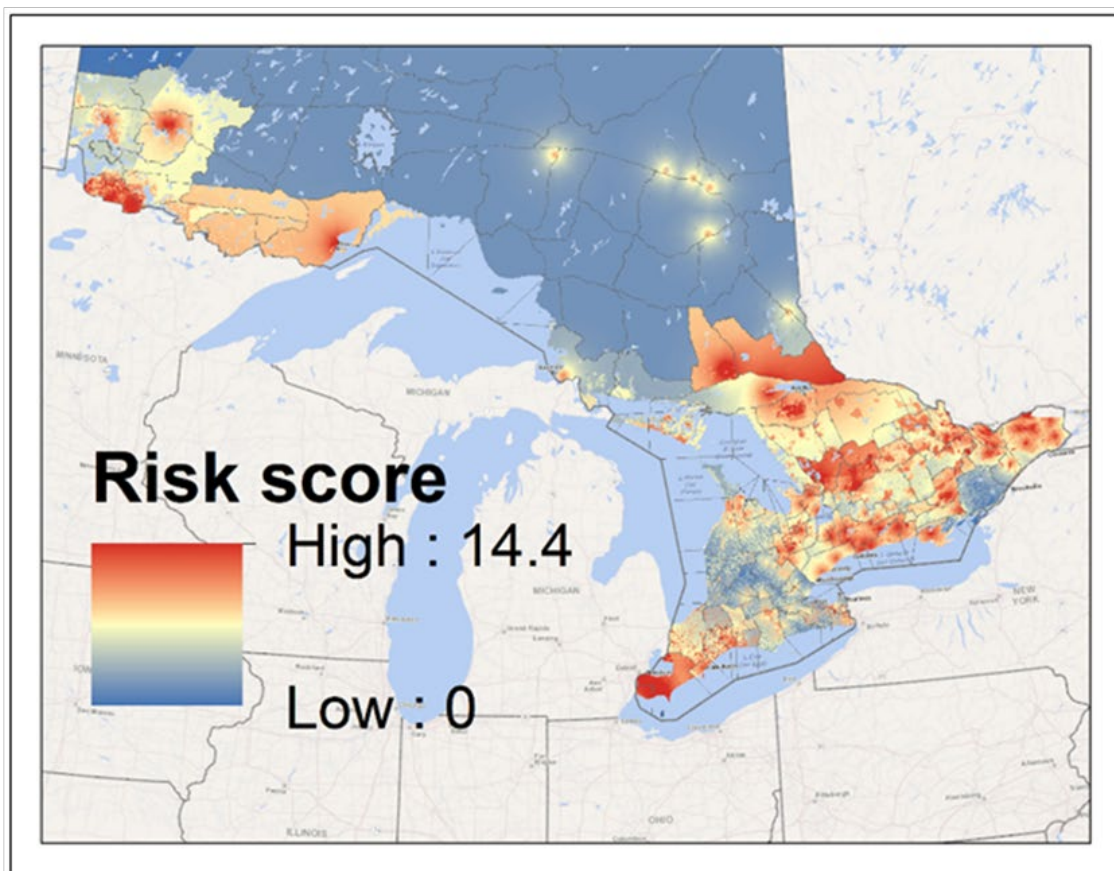
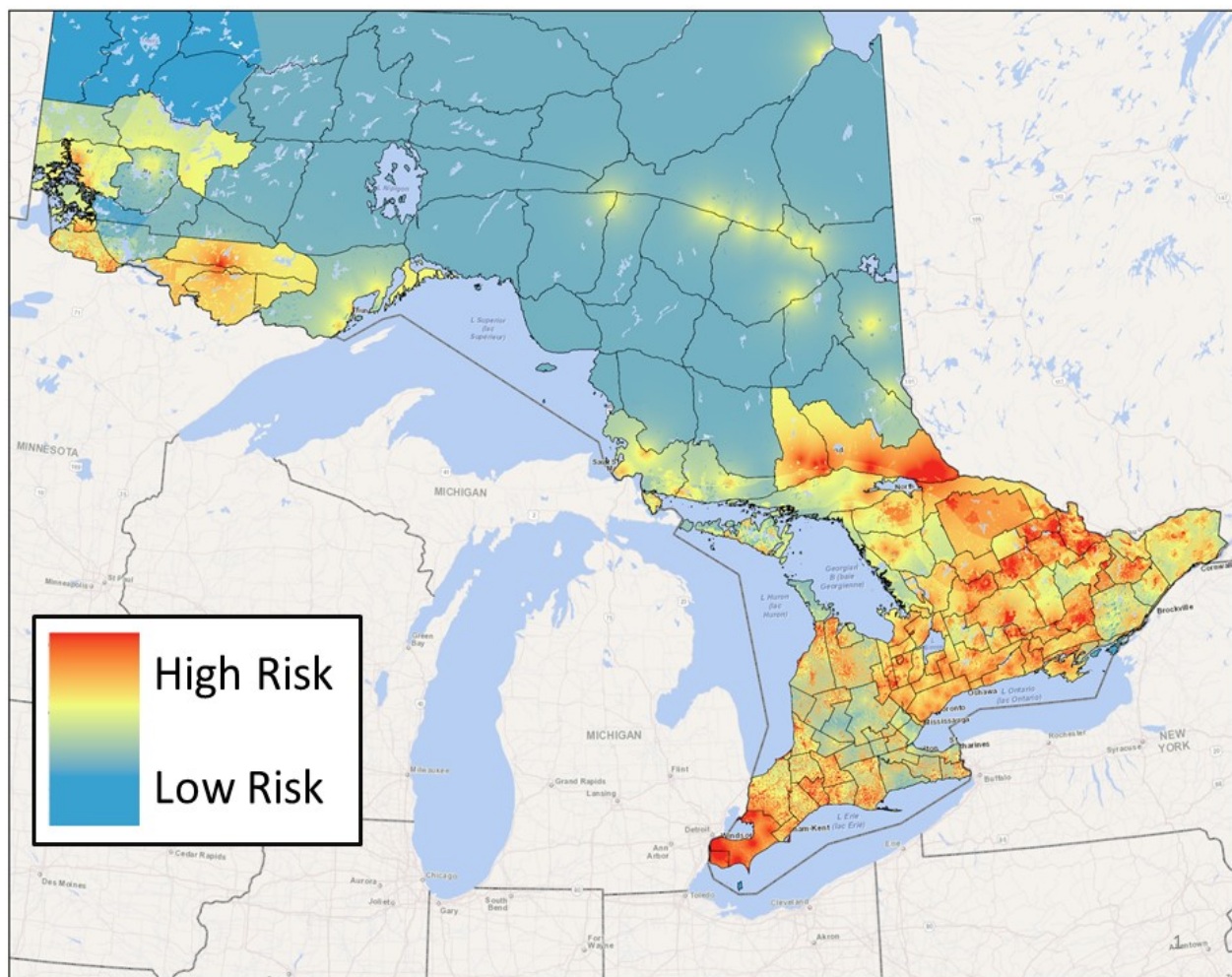


Figure 1. Example of layers used in risk assessment.

## 2020 Results

Using the Ontario CWD risk model, MNRF identified an area in southwestern Ontario as having some of the highest risk of CWD in 2020 (Figure 2). Accordingly, CWD surveillance was conducted in southwestern Ontario, in WMUs 94A, 94B, 93A, 93B, 93C, 92B, and 92C (Figure 3). Freezer depots were established at eight locations across the sampling area. Depots were opened in late September for archery hunters and remained open until early December so hunters could drop off their deer heads for testing. As well, during November and December, roving crews of MNRF wildlife research technicians sampled deer directly from hunters within the zone.



**Figure 2. Modelled risk of CWD in Ontario for 2020.**

2020 also saw the initiation of a pilot project working with a small number of local taxidermists to sample animals submitted for taxidermy. MNRF crews trained the taxidermists on data and sample collection methods at the beginning of the season allowing the taxidermists to collect samples independently of the MNRF crews

throughout the hunting season. This strategy has been successfully implemented in other jurisdictions and has been shown to be effective at increasing sample numbers while also increasing the proportion of older bucks tested. Old bucks are often not as well represented as other demographics in CWD field sampling as hunters are often reluctant to allow sampling on animals with large racks as it can interfere with certain styles of taxidermy mounts. Heads with large racks are also less frequently submitted at depots. Additionally, because of the increased movement behaviours of bucks compared to does, and the length of time it takes for CWD to appear in an animal, old bucks are likely the most valuable demographic to sample.

In the southwestern sampling zone (Figure 3), most of the samples (85%) were collected by MNRF roving crews. Eleven percent (11%) of samples were collected from depot submissions. The remaining samples (2%) were obtained from the Point Pelee National Park herd reduction program, a longstanding effort to keep the park's deer population from reaching unsustainable hyperabundant densities, and from local taxidermists (2%). In total, 533 wild deer were sampled and screened for CWD in southwestern Ontario, which was not detected in any of the samples.

Surveillance was also conducted in Eastern Ontario, in WMU 65 (Figure 4), for the fourth year in a row. WMU 65 was selected for regular surveillance in 2017 and revisited from 2018 to 2020 as a response to the 2018 detection of CWD in western Québec. MNRF established nine freezer depots within the eastern surveillance zone. Depots were opened in early October for archery hunters and remained open until early January, so hunters could drop off their deer heads for sampling. In total, 209 wild cervids were sampled and screened for CWD in eastern Ontario. Most of the samples (57%) were collected through depots and participating butchers. The remaining samples were collected from MNRF roving crews (28%) and local taxidermists (14%). CWD was not detected in any of the samples.

All retropharyngeal lymph nodes were screened for CWD at the Animal Health Lab in Guelph, Ontario, using enzyme-linked immunosorbent assay (ELISA) tests. Individual test results were posted online at [Ontario.ca/cwd](https://ontario.ca/cwd).



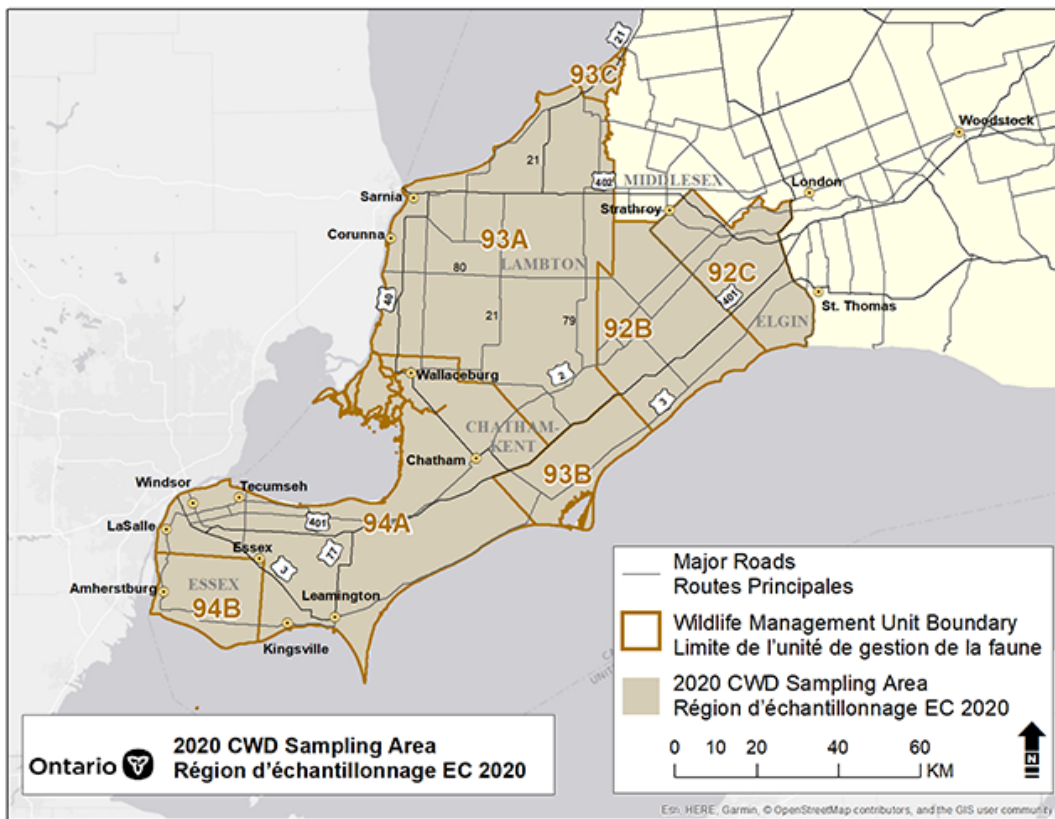


Figure 3. 2020 CWD surveillance zone in southwestern Ontario.

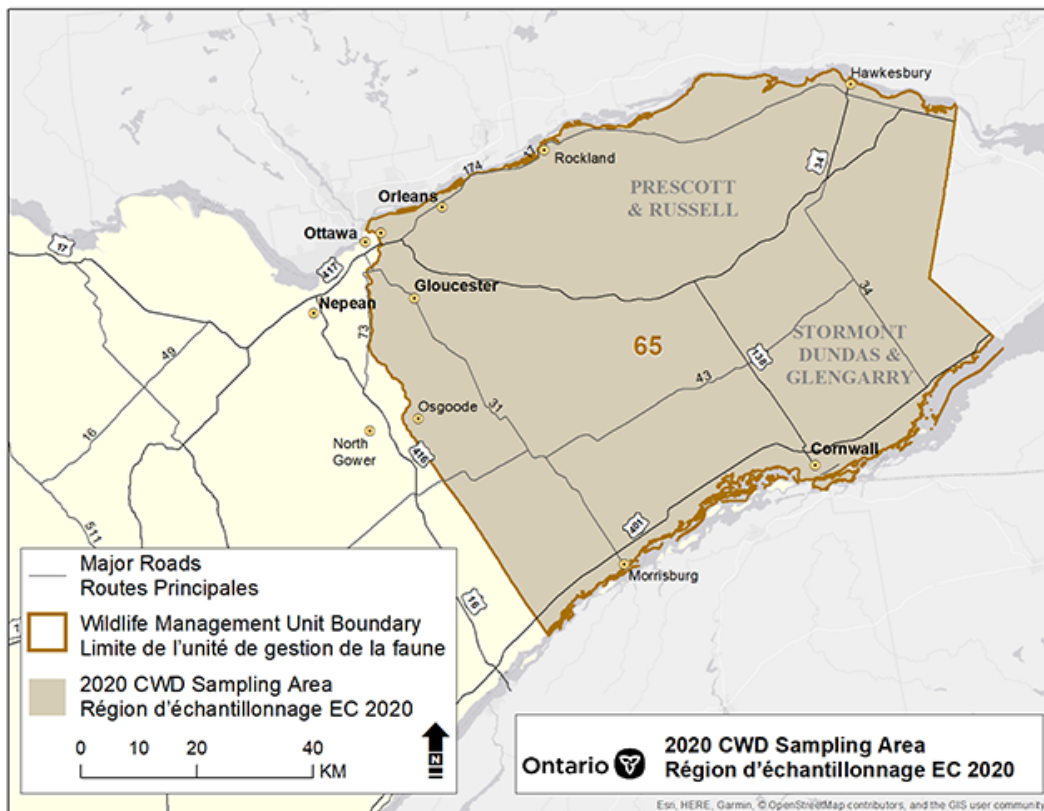
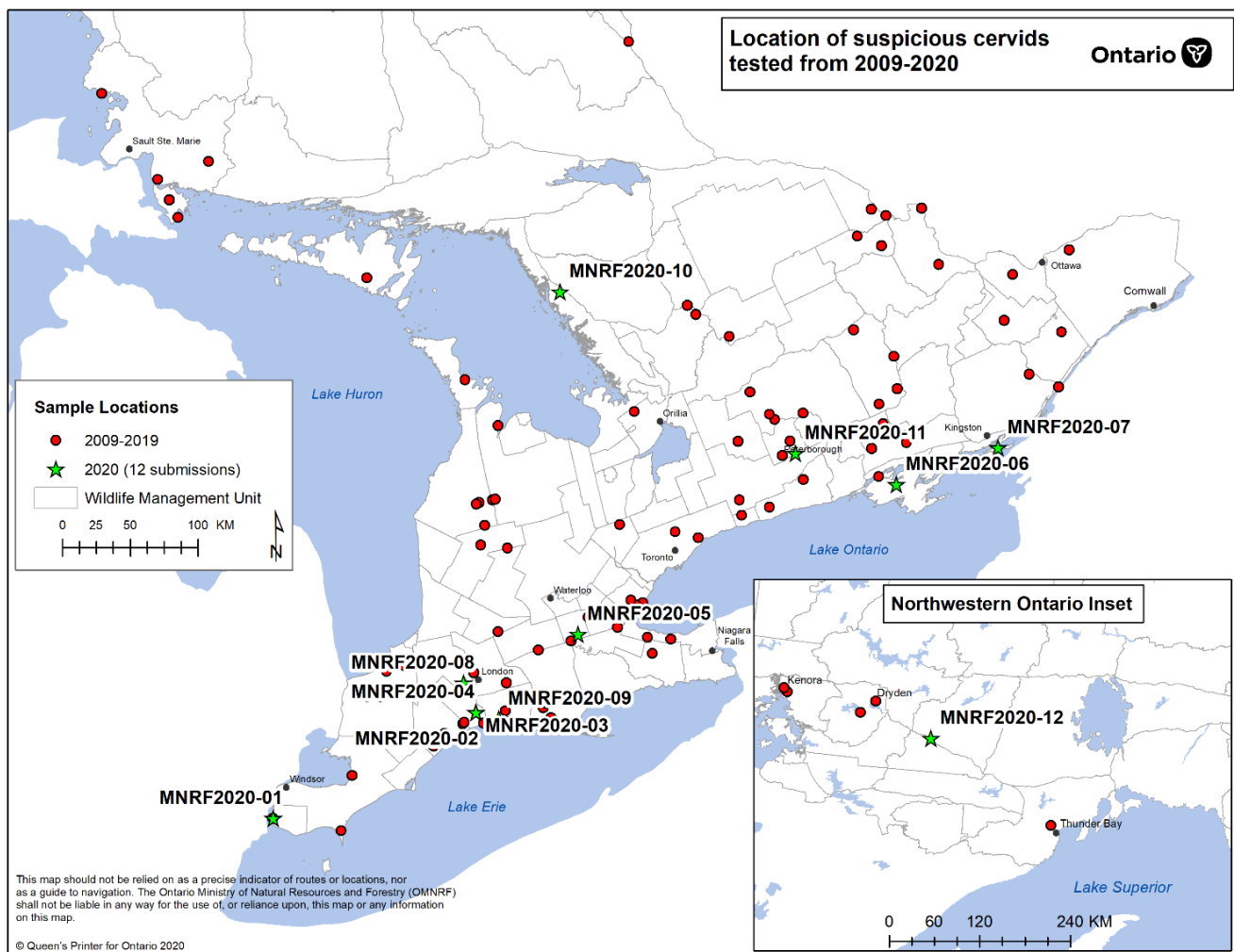


Figure 4. 2020 CWD surveillance zone in eastern Ontario.

# Other sampling

In addition to MNRF's annual systematic surveillance, the ministry also opportunistically tests samples from deer across the province that display CWD-like symptoms, as reported by the public or MNRF offices, throughout the year and across the province. In 2020, 11 white-tailed deer with abnormal behaviour or appearance were tested from across the province. Reported symptoms included abnormal appearance or behaviour, emaciation and disorientation. One moose was also sent for testing. Post-mortems on these animals were performed by the Canadian Wildlife Health Cooperative (CWHC) in Guelph, Ontario. All animals tested negative for CWD. Since 2009, 118 cervids displaying abnormal, CWD-like behaviour have been necropsied and tested for CWD (Figure 5); CWD was not detected in any of the samples.



**Figure 5. Locations of cervids displaying abnormal or CWD-like symptoms tested in Ontario since 2009.**

In 2020, MNRF staff continued a collaboration with Dr. Samantha Allen from the University of Guelph to collect blood samples from deer harvested within the CWD surveillance zone. The aim of the project is to look at the distribution of certain arboviruses in wild white-tailed deer, specifically the distribution of antibodies for eastern equine encephalitis.

## Program results to date

This was the 18th operational year of the CWD surveillance program. All areas of the province with significant deer populations have been surveyed at least once, and many of the highest priority areas have been surveyed two or three times. To date, 13,667 wild cervids have been tested for CWD during regular surveillance (Table 1).

**Table 1. Surveillance samples collected per year in Ontario.**

Year	Surveillance area	Wildlife Management Units	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
2015	Parry Sound-North Bay	42, 46, 47, 49, 50	305

Year	Surveillance area	Wildlife Management Units	Deer tested
2016	Manitoulin - north shore	36, 37, 43A, 43B, 44, 45	475
2017 <sup>4</sup>	Kingston - Cornwall	64A, 64B, 65, 66A, 66B, 67, 69A-2, 69A-3, 69B	513
2018	Mount Forest – Niagara Falls	79C-D,80,86A-B,87A-E,88,89A-B, 90A, 91B	457
2018 <sup>5</sup>	Ottawa - Cornwall- Hawkesbury	65	308
2019	Nipigon – Thunder Bay Rainy River – Fort Francis – Dryden	8, 9A, 9B, 10 and 13	174
2019	Ottawa - Cornwall- Hawkesbury - Arnprior	65, 64A	275
2020	Windsor, Sarnia, Chatham	94A, 94B, 93A, 93B, 93C, 92B, and 92C	533
2020 <sup>6</sup>	Ottawa - Cornwall- Hawkesbury	65	209
<b>Total</b>			<b>13,667<sup>1,2</sup></b>

<sup>1</sup>An additional 175 samples were collected in 2005, but the zones were not recorded.

<sup>2</sup>An additional 50 samples were collected in 2006, but the zones were not recorded.

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

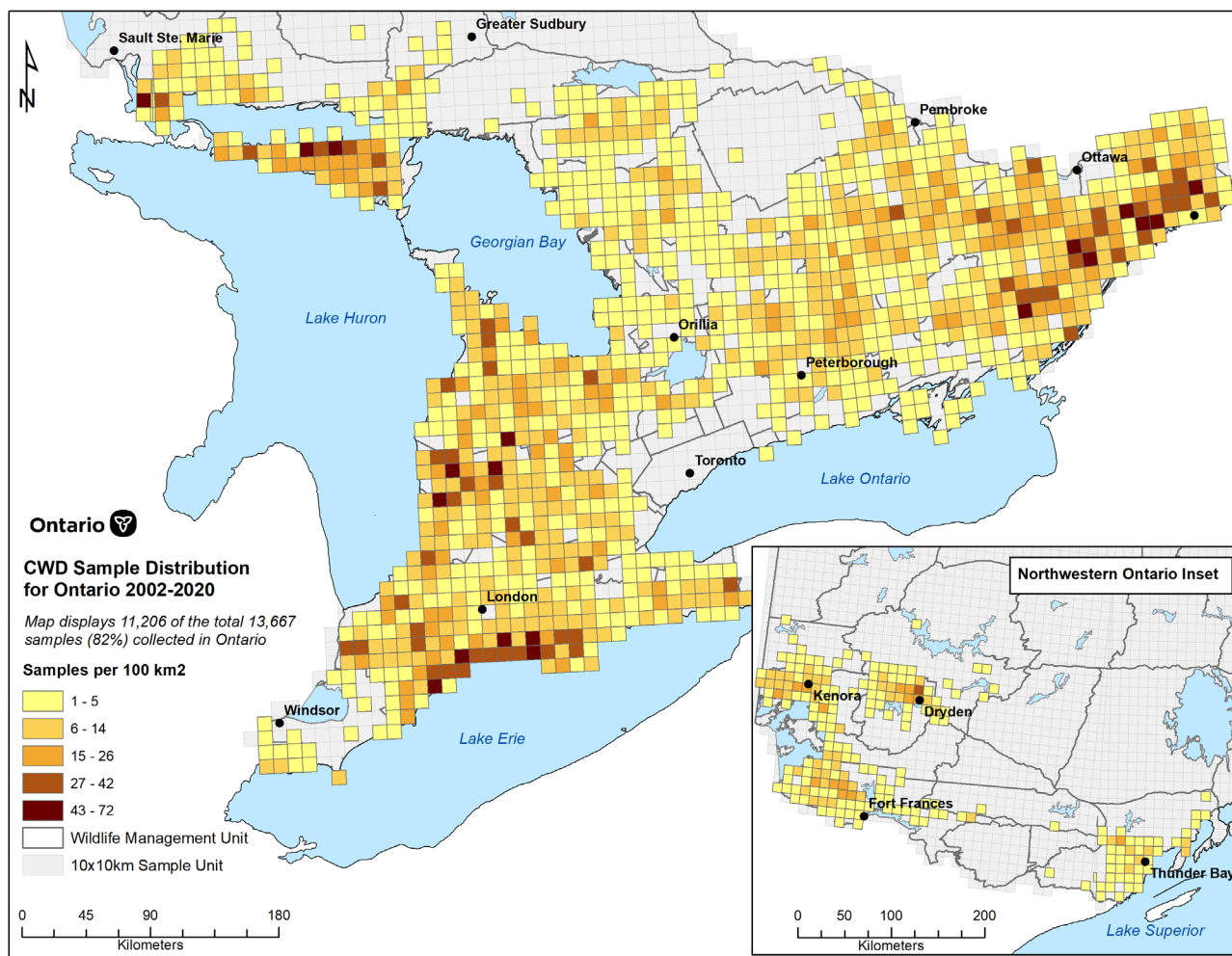
<sup>4</sup>One of the 2017 samples was a harvested moose.

<sup>5</sup>One of the 2018 samples was a harvested red deer.

<sup>6</sup>One of the 2020 samples was a harvested red deer.

CWD sampling in Ontario is confined to areas with medium to high white-tailed deer population densities. Much of northern Ontario either contains very low or no white-tailed deer populations. Sampling is therefore confined to southern, central, and northwestern Ontario. In southern Ontario, the sampling has been relatively evenly distributed (Figure 6), but with high concentrations in southeastern and southwestern Ontario where some WMUs have been sampled three times. Areas such as Windsor may appear to have had little or no sampling, but this is an artifact of the way location data is reported. The only areas of southern Ontario that have not received adequate sampling are the Greater Toronto Area (GTA) and Algonquin Provincial Park. The lack of sampling in these two areas is due to lack of deer hunting in the former and hunting restrictions in the latter. In northwestern Ontario, sample distribution is a function of suitable deer habitat.

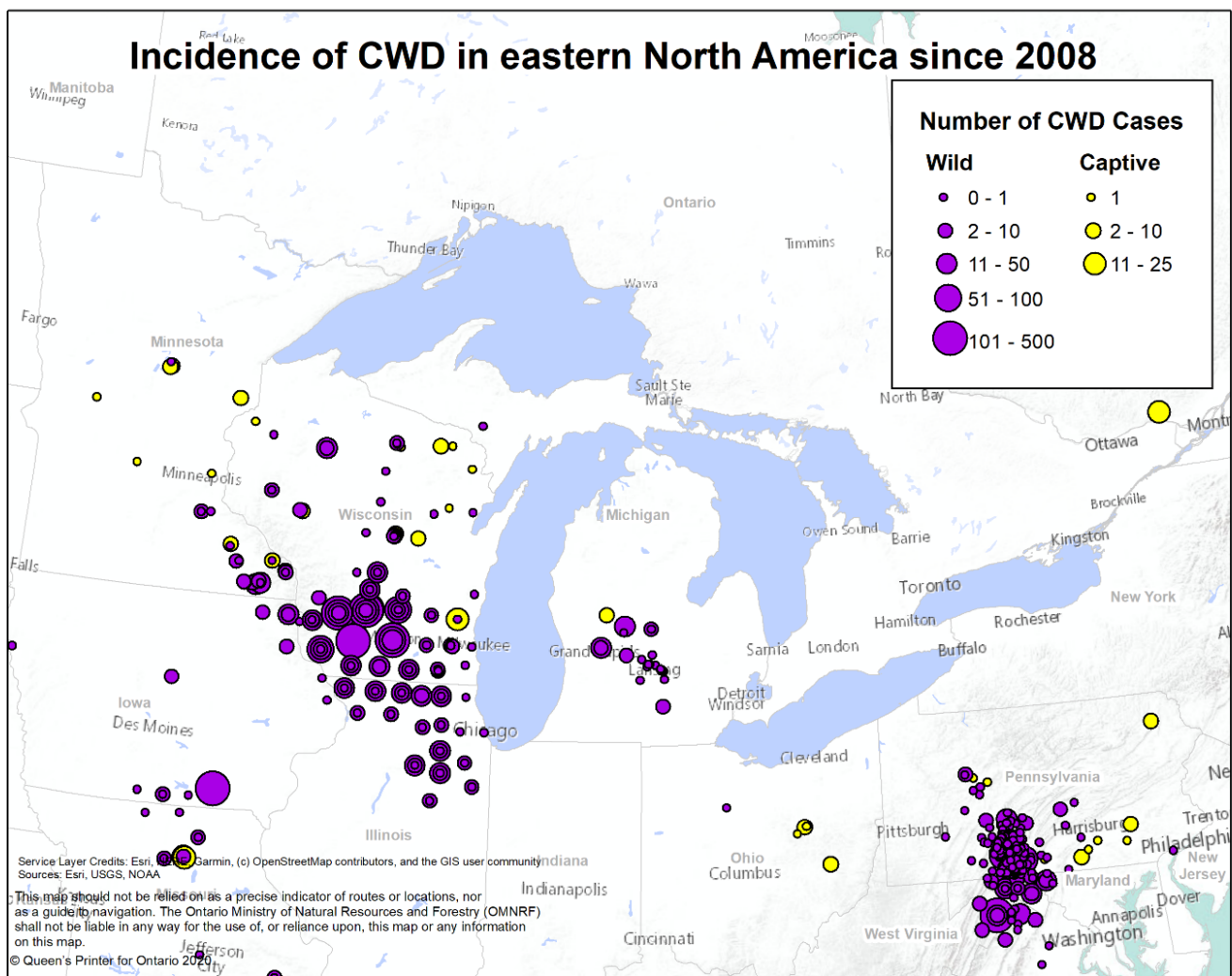




**Figure 6. CWD sample locations in Ontario between 2002 and 2020.**

## Neighbouring jurisdictions

As of January 2021, chronic wasting disease has been found in 26 US states and three provinces (Alberta, Saskatchewan, and Québec). It has also been found in South Korea and, more recently, Norway, Sweden and Finland. CWD has been detected in all five U.S. states and one province (Québec) that share a border with Ontario (Figure 7).



**Figure 7. Incidence of CWD in eastern North America from 2008 to 2020.**

## Regional summaries

In **Wisconsin**, the first cases of CWD was detected in 2002 in harvested wild deer near Mount Horeb (southwest of Madison) in southern Wisconsin. Wisconsin had been monitoring for CWD since 1999. Since 2002 cases have steadily expanded in both wild and captive populations. As of Jan, 2021, 57 of Wisconsin's 72 counties are considered "CWD-affected" while 1461 wild white-tailed deer tested positive for CWD in 2020 with 8050 total positives since 2002.

**Illinois** also detected its first case of CWD in free-ranging white-tailed deer in 2002. The state responded with disease management strategy focused on decreasing the number of infected individuals in CWD affected areas. The response included removal of deer via sharpshooting in CWD-infected areas, and strong partnerships with

landowners and hunters, to decrease the levels of disease and prevent further spread. As of June 2020, 18 counties in Illinois are considered affected by CWD with 176 deer testing positive in 2020 with 1002 total positives since testing began.

Since 2002, cases have steadily expanded in the southern Wisconsin - northern Illinois border area, predominately on the Wisconsin side of the border. To date there have been more than 9000 cases detected in these two states. Approximately four per cent of adult males in all CWD affected counties in Illinois are thought to be CWD positive, while portions of south-central Wisconsin where CWD is endemic have prevalence rates of nearly 50% in adult male deer.

In **Minnesota**, the first case of CWD was discovered in 2010 in a wild deer in the southeast part of the state. In response, Minnesota initiated a CWD management zone in a seven-mile radius of the case. In 2012 a captive European red deer (*Cervus elaphus*) was found infected with CWD in a herd near Minneapolis. Minnesota has reported 35 new cases of CWD for 2020, with 140 total positives since 2010. In 2019 a case was detected in a free ranging wild deer in Crow Wing County, which marked the first CWD positive wild deer outside the southeastern part of the state (approximately 300 km to Ontario's border at Fort Frances). As of February 2021 no additional cases have been found in Crow Wing County.

In **Michigan**, a case of CWD was diagnosed in 2008 on a game farm 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 2015 a free-ranging deer near Lansing (about 100 km east of the previous case and about 120 km west of Windsor Ontario) was Michigan's first confirmed case of CWD in a wild deer. In 2018 a CWD positive deer was found in Dickinson County in the Upper Peninsula near the Wisconsin border. No further CWD cases have been found in Dickinson County since. To date (as of February 2021) Michigan has tested 82,510 wild deer and detected 202 cases of CWD in the state. Baiting or feeding is banned in the Lower Peninsula and in the core CWD surveillance area of the Upper Peninsula.

There have been no cases discovered in **New York State** since seven cases were detected in 2005. Five of the cases were detected on a cervid farm and two in wild white-tailed deer near Syracuse (130 km south of the Ontario border near Kingston). New York state responded to these cases with a quick and aggressive culling and surveillance program. After six years of extensive testing and no new cases detected, the containment area restrictions for the state were lifted in 2010.

**In Pennsylvania**, the first detected cases of CWD were discovered in 2012, several on game farms in the southeast part of the state and three cases in wild deer in the south-central part of the state. Since then CWD has expanded in both wild and captive deer to within 200 km of the Ontario border at Fort Erie. Cases detected in 2018 on a hunting preserve and a farm are of particular concern because of their proximity to Pennsylvania's elk range. However, more than 100 elk are tested each year and CWD has not yet been detected. Since the disease was discovered in 2012, 564 free ranging deer have been confirmed to have CWD (as of February 2021) and CWD positive animals have been found on 24 deer farms, 15 of which have been entirely depopulated (as of October 2020). There are over 1000 cervid game farms operating in the state.

**Ohio** announced their first cases of CWD in the state in October of 2014. They found 19 positive cases on a game farm located in the northeast part of the state. The farm had been under quarantine since April 2014 after an investigation determined that the farm had a known connection with a game farm in Pennsylvania that had animals test positive for CWD. Several cases were detected in 2018 on a hunting preserve and a captive white-tailed deer facility. The facility was depopulated, and an enhanced disease surveillance area was established around the area to monitor the free ranging white-tailed deer population. In total 22 captive white-tailed deer have been detected in Ohio. In December 2020 a free-ranging deer tested positive for CWD in Wyandot County, the first positive case in wild deer in Ohio. Wyandot County is within 200km of the Ontario border at Windsor.

### **Adjacent Canadian provinces**

In September 2018, **Québec** saw its first case of CWD on a game farm in the Laurentides region (approximately 15km from Ontario's border). At that time Québec's Ministry of Forests, Wildlife and Parks (MFFP) implemented measures to protect its wild cervid populations and the Canadian Food Inspection Agency (CFIA) ordered a depopulation of the farm and testing for CWD of all the animals over 12 months of age. In total, eleven red deer from the farm tested positive. Since September 2018, MFFP have tested thousands of wild cervids in the area surrounding the CWD positive farm in Québec and all have tested negative.

**Manitoba** remains CWD free and maintains an on-going surveillance program.

### **European and Asian cases**

In 2016, the first detection of CWD in Europe occurred in southern **Norway** in a free-ranging female reindeer (*Rangifer tarandus tarandus*). This is also the first detection of CWD infection in reindeer worldwide. Further cases of CWD were detected in 18



reindeer (in Nordfjella), seven moose, and one red deer (in Selbu in the north) in Norway later that year. The infected moose and red deer were older animals, suggesting that these were cases of atypical CWD, a form of the disease that is thought to occur spontaneously in older animals and which is less likely to be infectious. The reindeer, however, were all from the same herd in Nordfjella, a rocky region in the middle of the country. The government quickly implemented a cull of the herd, roughly 2000 reindeer, or nearly 6% of the country's wild population, to stop the spread of the disease. In September 2020 the first wild reindeer outside the Nordfjella region, in the Vinje municipality, tested positive for the contagious form of CWD. This reindeer was harvested in the south portion of Hardangervidda where 3520 reindeer had been tested before the positive case was found.

In early 2018, the first case of CWD was detected in Kuhmo, eastern **Finland** in a 15-year-old European elk (*Alces alces*). Finland has been monitoring for the disease since 2003 and have tested over 3000 samples. Monitoring of the disease is currently being intensified in the Kuhmo and Kainuu region. Early analyses suggest that the case is atypical CWD.

In March 2019, **Sweden** detected its first case of CWD in a 16-year-old emaciated female moose. Sweden detected two additional cases later in the year in a second sick-acting 16-year-old female moose and an apparently healthy 10-year-old moose. In 2020 a fourth case was found in a 14 year old moose. In all these cases the brainstem was positive for CWD while the lymph nodes were not.

Early studies show that the strains of CWD (both typical and atypical) found in Europe are different from the North American strain.

All cases of CWD found in Korea have been in captive deer imported from North America after first being detected in captive elk imported from Saskatchewan in 1997.

# Acknowledgements

Thank you to staff at the 2020 depot locations and cooperating butchers for all assistance provided: Antler River Archery, Appin BBQ, Atkins Archery and Custom Strings, Brian Moore, Farr Acres Enterprises, Mapleton Taxidermy, Roesch Meats and More, Santarossa Shooting Sports, André Hotte Boucherie, Clement Meat Cutter, Fence Depot and More, Gillmore's Feed Barn, Jamieson Campbell 1989 Ltd, Matt Sullivan, Pronature Rockland, South Nation Archery Supply, Vogel Fine Meats. Additional butcher shops in WMUs 65, 94A, 94B, 93A, and 92B also supported our surveillance efforts. Staff at the Animal Health Lab in Guelph have processed samples for the past 19 years, providing rapid results and professional service. Staff at the Canadian Wildlife Health Cooperative in Guelph have performed post-mortem investigations on suspicious deer and coordinated associated CWD testing.

James Byrne at the Ontario Ministry of Agriculture, Food, and Rural Affairs has provided advice about the Ontario captive cervid CWD surveillance program. Brian Stevens at the University of Guelph provided advice on symptoms of strange-acting wildlife.

Jason Webb, Lisa McShane, Joffre Côté and other MNRF staff from the Kemptville and Aylmer district and enforcement offices assisted with logistics and local knowledge. MNRF Resource Management Coordinator Elizabeth Holmes provided valuable French language assistance, MNRF regional terrestrial science specialist Jay Fitzsimmons provided regional expertise and advice. Chris Heydon from Fish and Wildlife Policy Branch developed and maintained MNRF's CWD policies and CWD response plan document in collaboration with Wildlife Research and Monitoring Section (WRMS) staff. Communication Services Branch assisted with posting test results online.

MNRF district staff from across the province assisted with submitting sick and strange-acting cervids for testing. Thanks to Ontario Parks and Parks Canada for providing surveillance support.

MNRF WRMS staff Sarah Hagey, Erica Newton, and Kelly Milne for assisting with mapping and database management. Kevin Middel was an integral developer of the Ontario CWD risk model; the model is now updated annually by Erica Newton. Communications Services Branch assisted with advertising campaigns and Lauren Crawshaw (WRMS) designed this year's commemorative crest.

Anne McCarthy helped develop communications products, ensured accessibility of this document and answered social media questions regarding CWD. Mark Gibson and Ayden Sherritt led the surveillance crews and managed depot locations, sample logistics, and supply management.

Program lead: Larissa Nituch.

Crew leaders: Mark Gibson and Ayden Sherritt.

Crew staff: Jaclyn Adams, Mike Allan, Steve Bennet, Hower Blair, Andrew Collard, Janet Greenhorn, Sophia Konieczka, Evan Lucas, Grace McCoy, Travis McGee, Kelly Milne, Scott Taylor, and Katrina Wisniewski