Tracking Chronic Wasting Disease in Missouri

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What is Chronic Wasting Disease (CWD)?

- CWD is a neurological disease that attacks the nervous systems of cervids, such as deer and elk.
- Fatal & Infectious
- Once established, grows in prevalence & distribution
- Leads to population declines over time
Why did MDC start looking for the disease

Finding CWD in Wisconsin in free-ranging white-tailed deer

Concerns over interstate movements of white-tailed deer from CWD positive states

Early detection of CWD is essential to its management
Missouri has a long history of the cooperation between hunters and the Conservation department. For over 30 years it was required all deer and turkey harvested in the state were brought to check stations. Over time the check stations became a tradition. When MDC began sampling for CWD we utilized check stations for sampling. The goal was to test every county over a 3 year period.
CWD Sampling

• Beginning in 2002 we began large scale testing; sampling 200 deer each from 30 randomly selected counties
• The first year heads were removed at check stations and transported in barrels to a central location to pull the samples
• Original database had 9 fields in the sample table and harvest was located to the county
• Data sheet and sample bag had bar codes attached to track samples
• All data was collected on paper data sheets and entered into MS access.
• No cases were found
Sampling continued

• 2003-2004 samples were collected at the check stations and preserved in formalin
• Completed sampling across all counties, over 22,000 samples were collected
• Data was entered onto paper data sheets at the check stations and later entered into MS Access at a central location
• Samples were sent to various labs for testing and results were entered into MS Access
• No cases were found
2005-2006

• Initial state wide sampling was complete and CWD was not detected
• Department discontinued check stations
• Targeted testing of sick deer was the only sampling done
• Created new data sheet for sick deer
• All samples were collected in the field sent to a central location for processing and data was entered into MS Access
• Less than 100 deer were sampled and no cases were found
2007-2009

- In 2007 MDC began a three-year program of CWD testing in which 1/3 of the state was sampled annually. Taxidermists were recruited to collect samples from adult males.

- Sample collection kits containing sampling equipment, data sheets and bar codes were provided to the taxidermists. MDC collected all the samples for data entry at a central location. Samples and results were entered into MS Access.

- Harvest was located to the county prior to 2009. Beginning in 2009 we required the taxidermists to ask the hunter to locate harvest to the section.

- 4,125 deer were sampled, none tested positive for CWD.
It’s Here

• 2010 - 1st CWD positive found in Missouri
  Positive came from a captive breeding facility in Linn Co

• Worked with MO Dept of Agriculture and facility owner to depopulate the facility

• The owner also operated Big Game Hunting preserve 20 miles away in Macon Co

• That site was also depopulated and a total of 11 positives were found in the two sites
How did we respond?
MDC’s response

- In an effort to increase sampling intensity and increase the likelihood of early detection, MDC began annual sampling of ½ of the state – State wide surveillance -
- Established targeted surveillance around the captive facilities where the CWD positive deer was found
- State wide sampling of sick deer
What is targeted surveillance

- Once a CWD positive was located we buffered the harvest location to establish the surveillance area.
- Contact landowners inside the buffer allowing them to harvest deer on their property or allow MDC staff on their property to harvest deer. Spotlighting and baiting were permitted.
- Samples were collected after all deer seasons were complete January 15 – March 15.
- Additional tables were added to the database to track ownership, permissions and meat tracking fields.
- All deer harvested are tested for CWD and only given back to the landowner after testing negative.
- Data is entered into Excel at the surveillance zone site and then sent to a central location and imported into MS Access.
2012

- Two free-range deer tested positive for CWD in Macon Co
- Close association between captive facility positives and free-ranging deer positives suggest a recent introduction of CWD to the free-ranging deer population
- Established CWD management zone. All counties that a portion of the county falls within 25 of the positive sections
- Positives helped to refine targeted surveillance to 5 mile buffer around positive sections. We began calling them Core Areas
- Began testing road kill deer within the CWD management zone
- 3316 samples were collected
2013-2014

- 4 different data sheets were created for the different sampling types. Hunter harvest, targeted surveillance, road kill deer and sick deer
- Positives are found in 2 additional counties
- 2 surveillance zones were created one of which transitioned into a Core Area in 2014
- CWD was now in 3 counties in North Missouri
- MDC hired a wildlife veterinarian and wildlife health specialist to help oversee CWD operations
- 7,400 samples were collected
2015

- Created a single Optical Character Recognition (OCR) scannable data sheet for all sample types
- All data sheets were sent to a central location for scanning
- After scanning OCR collected data was verified by survey shop staff for accuracy and stored in MS Access
- State wide, sick deer and road kill deer sampling continued
- Landowner databases were centralized stored in MS Access and provided to Surveillance/Core Area staff in MS Access and ArcMap
- CWD Positive free-ranging deer found were now in 5 counties across north and central Missouri and we now had 5 Winter Operations areas
- 7800 samples were collected
Mandatory sampling of all deer killed opening weekend of fall fire arms season in the 29 county CWD management zone. Over 20,000 samples were collected opening weekend.

Wildlife Health database was created in MS SQL.

MS Access sample database and landowner databases were imported into the Wildlife Health database.

The original MS Access sample table had 9 fields. The sample table in the new wildlife health database had 68 fields.

Created new meat tracking table in the Wildlife Health database.

Created MS Access front ends into SQL for staff to enter data and query data from mandatory sampling and targeted culling operations.

Separate data sheet for Winter operations was created, Android app was created to enter Winter operations records. Data went from tablet into a new table called CullRecords in the Wildlife Health database.
2016 continued

- Developed web page for hunters to look up testing results
- Developed web apps for locating sampling stations, mapping sampling results
- Developed web apps to provide more information about targeted culling efforts
- CWD Positive free-ranging deer found in 1 new county
- CWD had been found in 6 counties and 1 additional Surveillance operation started
  Now there was a total of 7 Winter Operations areas
- 25,700 deer sampled
2017-2018

- MS Access front end for SQL was replaced with Web apps for sample processing, batch updating for results, data cleanup, landowner permissions, winter operations, sample collection, and meat tracking
- CWD positive in free-ranging deer found in 16 counties
- 24,600 and 32,164 deer sampled
2019

- Will continue Fall mandatory sampling. Sampling will occur in 29 counties
- Winter operations will continue, 10 operations
- Testing phone app for collecting sample data at Fall mandatory sampling stations
CWD in 2019

Distribution of Chronic Wasting Disease in North America

- CWD in free-ranging populations
- Known distribution prior to 2000 (free-ranging)
- CWD in captive facilities (depopulated)
- CWD in captive facilities (current)

All locations are approximations based on best-available information
Conclusion

• MDC has tested over 135,000 free-ranging deer over 19 years
• 116 positive tests
• 16 positive counties, 10 winter operation areas
• Winter operations accounts for just 6% of all CWD samples to date, but has removed ~48% of CWD positive deer
• We have gone from 3 staff members primarily involved in data management to 6
• Have developed a Wildlife Health database for tracking and monitoring wildlife health diseases
MDC remains steadfast in following through with the implementation of reasonable management actions to limit the further spread of CWD.
Questions?