ON ALERT:

NORTH CAROLINA CONTINUES TO MONITOR THE THREAT OF CHRONIC WASTING DISEASE

The incurable disease has serious implications for the state's deer herd

WRITTEN BY SYDNEY BROWN

The lights dim as Dr. Mark Ruder takes the podium during an emergency meeting of the Wildlife Commission last June. Ruder, a professor at the University of Georgia's College of Veterinary Medicine and a representative of the Southeastern Cooperative Wildlife Disease Study, begins to tell the tale of wildlife disease management and the implications of a disease that is prominent in many biologists' minds: chronic wasting disease (CWD). The room is full of serious faces and we are all here for the same reason: to discuss North Carolina's CWD Response Plan following a positive test in a deer just over 30 miles across the state line in Virginia.

Images of sickly, emaciated white-tailed deer drooling copious amounts of saliva flash across the screen. Interspersed are images of healthy elk and deer. The stark contrast is a sobering reminder of the consequences of a disease that appears unstoppable. Pausing my note-taking, I take a moment to look ahead at the agenda. Up next are three more distinguished speakers, all from wildlife agencies in states with confirmed CWD cases: Tennessee, Arkansas and Virginia. I can tell it is going to be a long, but informative, day.

Read All About It

Transmissible Spongiform Encephalopathy (TSE)…my mouth slowly mutters these strange, unfamiliar words. I catch on as I look at the following pages that include links to mad cow disease and scrapie, two diseases that are more easily pronounced and which jog memories of large news coverage. The more I read, the more I understand that TSE is interchangeable with the term prion disease, and the more frightening the diseases become. All of these diseases are incurable and difficult to detect due to their long incubation periods. Infected white-tailed deer take at least 16 months to show symptoms.

My finger pauses on the part of the pamphlet that reads, "these prions gradually build in the brain, causing brain cells to die." I've heard of brain-eating amoebas, a silent-but-deadly killer in freshwater systems, but not prion build-up. In order to better understand what CWD is and how prions affect wildlife, I turn to N.C. Wildlife Resources Commission Wildlife Health Biologist Merril Cook, who provides the following information:

"CWD is caused by an abnormally folded protein [known as a prion] that collects in the animal's brain and eventually bursts, creating a 'spongy' appearance," Cook said. "The disease is transmitted through direct [social behavior] and indirect [contaminated soil] contact. Since it is caused by a protein, and not a virus or a bacterium, it is extremely persistent in the environment and there is currently no cure."

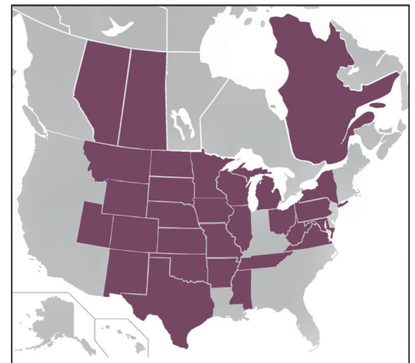
So not only is the disease pervasive in killing its host, but it can persist and circulate in the environment for a very long time. The implications are vast and remind me of something that Dr. Jenn Ballard from the Arkansas Game and Fish Commission mentioned in her presentation: "Prions are sticky and impossible to eradicate. Once introduced into an area, that area will forever be a hot zone."

Following Ballard's statement, multiple members of the Commission described how officials in Colorado burned fields, at sustained temperatures, where infected deer had been penned in attempts to eradicate the disease. For decades each spring, the grass in the burned areas still tested positive for CWD prions.

MELISSA McGAW/NCWRC

Left: The Wildlife Commission has been collecting deer lymph nodes and brain stems to test for chronic wasting disease since 1999. Samples come from roadkill, taxidermists and deer hunters. Below: An emaciated deer shows many symptoms of chronic wasting disease, which can include weight loss, listlessness, lack of coordination and drooling.


TERRY KREEGER, WYOMING GAME AND FISH AND CHRONIC WASTING DISEASE ALLIANCE



States and Provinces where chronic wasting disease has been detected. Visit ncwildlife.org/cwdstates for an interactive map.

Seen and Unseen Dangers

CWD is one of the greatest threats to the North American members of the deer family Cervidae, which includes various species of deer, elk, moose and reindeer/caribou. Due to CWD's long incubation period, it is difficult to tell if an animal is suffering from CWD until the disease has run its course. Weight loss, listlessness and lack of coordination, drooling, drinking copious amounts of water and increased urination are all signs to look out for. However, CWD prions have been detected in the urine, feces, blood and saliva of infected deer well before the animals begin to exhibit any obvious signs of the disease.

The N.C. Wildlife Resources Commission has been active in CWD surveillance and prevention. The disease has not been detected in North Carolina, but the state has been active in surveillance of the disease for decades because prions spread by animal-to-animal contact as well as animal contact with contaminated soils and plants.

The Commission has conducted CWD testing in North Carolina since 1999. In 2003, a systematic, five-year interval, statewide surveillance was implemented allowing the Commission to gather even more samples. In 2018, a revised surveillance strategy was adopted with sampling occurring on an annual basis with five-year sampling goals for each county. Testing for CWD is imperative because most deer population models predict notable declines or even localized extinctions over a period of 50 to 200 years following the first positive case.

Sampling for CWD includes the removal of an animal's lymph nodes or brain stem, which are then sent off to a certified lab for testing. There currently is not an approved live animal test. As a result, every test is an animal mortality. Many of the samples are collected from roadkill or come from taxidermists and hunters, which means that an animal was utilized for more than just testing. Since annual sampling began in 2018, the Commission has tested roughly 2,000 deer per year. In total, the Commission has tested more than 15,000 deer since 1999.

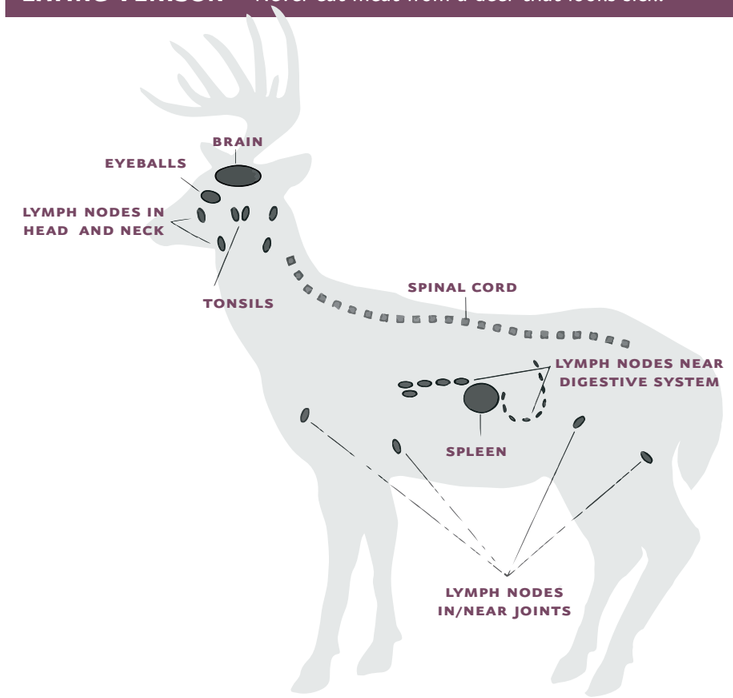
CWD testing is also recommended by the United States Centers for Disease Control (CDC) when hunting and consuming venison in CWD-positive states. Although there is no scientific evidence that CWD can infect humans and there have been no reported CWD cases in people, the potential impacts of CWD on human health remain largely unknown.

There are implications that CWD poses a risk to some non-human primates, and the Commission recommends that hunters take precautions when handling and processing deer. Safeguards include wearing rubber or latex gloves, using knives or utensils only for field dressing and processing, and minimizing contact with the brain, spinal cord, spleen and lymph nodes during deer processing. Even though there is minimal concern for CWD transferring to humans, the World Health Organization stresses the importance of keeping the agents of all known prion diseases from entering the human food chain.

Closing the Net

Dr. Jon Shaw, supervising biologist of the Commission's Wildlife Management Division, takes the podium last to present North Carolina's CWD Response Plan and prevention measures. Current measures for prevention include banning importation of live cervids known to be susceptible to

EATING VENISON Never eat meat from a deer that looks sick.



NEVER EAT A DEER'S:

- Brain
- Eyeballs
- Spinal cord
- Spleen
- Lymph nodes

DO THE FOLLOWING TO BE SURE YOU'VE REMOVED ALL OF THE PARTS LISTED ABOVE:

- Gut the deer
- Remove the head
- Cut meat from the bone with a knife; don't cut through bones
- Remove all fat, membranes and tendons from the meat


MELISSA McGAW/NCWRC

It is important to follow safety protocols when handling and processing deer, including wearing rubber and latex gloves and using knives or utensils for field dressing or processing.

CWD (whitetails, blacktails, mule deer, elk, caribou and moose), banning importation of whole cervid carcasses and of high-risk carcass parts, and proposed regulation on the use of urine and other secretions from cervids used to attract wildlife and that could contain prions.

"Once we are notified of a positive CWD case, we must act decisively to stop the bleeding," Shaw told the Commissioners.

The bleeding that he is referring to would be the unchecked spread of prions in the environment which would circulate amongst the deer herd once CWD is detected. His comment immediately refers me back to several slides from the presentation by Dr. Dan Grove of the Tennessee Wildlife Resources Agency (TWRA). In late 2018, the first deer were detected after years of testing in the western part of Tennessee. After the first positive test, the TWRA increased testing in the affected area and the few dots on the map turned into thousands. A cloud of red hangs over an eight-county area, with four surrounding counties highlighted in yellow indicating a high risk of finding a positive case. Since CWD is a slowly progressive disease in individual deer and not the herd, it is likely that the disease had been circulating undetected for some time.

Catching CWD early, when the embers of the disease are still smoldering, is difficult. But with correct management strategies, the Commission hopes to maintain CWD transmission rates at low levels and contain it to the greatest extent possible, with the understanding that they are dealing with a free-ranging deer herd. Alongside the North Carolina Department of Agriculture and Consumer Services (NCDA&CS), the Commission is prepared to take fast-acting measures upon the first notification of a CWD occurrence in order to minimize its occurrence and spread. Depending upon whether the positive case is a farmed cervid (those of the family Cervidae raised in captivity) or a wild deer, the NCDA&CS and Commission plan to work closely together to determine the spread of the disease and figure out the next logical steps.

Some of the measures that must be taken in the affected areas include mandatory CWD testing, novel disposal methods of deer carcasses and carcass parts, and prohibition of the intentional feeding of deer. If CWD is ever confirmed in a free-ranging cervid, the Commission's objective will be to obtain tissue samples from 50 percent of the estimated animal population in an area within a 5-mile radius of the original positive location. The Commission will attempt to accomplish the collection of tissue samples by using hunters and hunting during the hunting season. Only if the quota can't be met with the assistance of our hunters would the Commission explore other alternatives, such as using sampling teams to collect animals for testing. All of these methods will be adopted to stop the social spread of the disease and its spread into the environment, and to determine how far-ranging the disease is in North Carolina.

At this point in the presentation my eyes have become the size of saucer plates. I have long heard whispers about the seriousness of CWD, but I had no idea how truly devastating the disease could be. It harkens back to a statement by Grove: "Disease management of wildlife is a long-haul fight. What TWRA is aiming at is to have deer 20 years in the future for people to hunt and consume."

Public Support

A common theme has appeared throughout the day of presentations. Without hunter support, wildlife agencies in Arkansas, Tennessee and Virginia would not have been successful tracking CWD in their respective states. Grove and Ballard express similar sentiments.

"Management of CWD has to be a partnership between the agency and hunters," Ballard says. "Without the support of hunters, we would be behind the curve. From hunters contacting the legislature demanding more funding for testing, to helping us harvest more deer off the landscape, hunters have and will continue to rise to the challenge."

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Shaw also shares his thoughts about the positive relationship the Commission has with hunters in North Carolina. "Hunters of North Carolina have always been one of our agency's greatest assets. We have and continue to rely on cooperation from hunters to be successful in our surveillance and prevention efforts, and if CWD is detected in North Carolina, the success of our response efforts will undoubtedly hinge on their support."

CWD will be a war that the Commission, NCDA&CS and various other state agencies will fight for years to come should the disease be detected in the state. Every battle must be won in order to prevent the spread of the disease and to keep North Carolina's deer herd healthy. The Commission will continue to ask the public to report sightings of sick deer, as well as rely on hunters to voluntarily submit samples for testing.

With the new positive sample in Virginia's Montgomery County, approximately 33 miles away from Surry and Stokes counties in North Carolina, the threat of CWD in our state is real. As a result, the Commission is planning to increase testing and will ask hunters to submit additional samples of harvested deer this coming deer season, especially in Surry, Stokes, Alleghany and Rockingham counties.

As I sit on my back porch writing this article, a family of neighborhood deer passes by. They are alert to my presence and a doe is staring in my direction. I look back at her and her fawn that is quickly losing its spots and I ask aloud, "What will happen to you?" ◆

Sydney Brown is an education specialist with the N.C. Wildlife Resources Commission and a regular contributor to Wildlife in North Carolina. *She can be contacted at sydney.brown@ncwildlife.org. For more information on CWD, visit ncwildlife.org/Deer-Diseases.*

NATURE'S WAYS Just What Is a Prion?

See Nature's Ways, page 43.