

Chronic Wasting Disease Response Plan

Executive Summary

Chronic wasting disease (CWD) is an infectious neurological disease that occurs in North American deer (*Odocoileus spp.*), Rocky Mountain elk (*Cervus elaphus*), and moose (*Alces alces*) and belongs to a group of diseases called transmissible spongiform encephalopathies (TSEs). Chronic wasting disease is progressively fatal and has no known immunity, vaccine or treatment. Since 2002, over 32,000 hunter-harvested and 500 opportunistic or targeted wild deer have been tested for CWD in Minnesota, with no positive cases identified.

This plan establishes general procedures to be followed for managing CWD if it is found in wild deer and procedures for wild deer surveillance if CWD is detected in a captive cervid facility.

CWD in Wild Cervids

If CWD is detected in wild cervids in Minnesota, the Minnesota Department of Natural Resources (MNDNR) has identified 4 primary goals of managing the disease:

- 1) Determine and monitor the prevalence and geographic distribution of CWD in the affected area.
- 2) Prevent or minimize further spread and new introductions of the disease.
- 3) Support and conduct applied research on CWD and its epidemiology.
- 4) Provide accurate and current information about CWD to the public, agency personnel, and constituent groups.

To accomplish these goals, a number of activities would occur as quickly as possible, regardless of the time of year the discovery is made. These would include a survey to determine deer density and distribution in the area where the CWD-positive cervid was detected, creation of a

CWD management zone, implementing a feeding ban, prohibiting the import and export of cervid parts from within the zone, conducting opportunistic surveillance (e.g. vehicle-kill surveillance) and substantially increasing targeted surveillance within the zone.

Following these initial steps, the prevalence and spatial distribution of the disease will be assessed through the sampling of wild cervids. The sampling method will be dependent upon the timing of the discovery in relation to the next upcoming deer hunting season and may include hunter-harvested surveillance, special hunts, landowner shooting permits, and agency culling.

CWD in Captive Cervids

If CWD is detected in a captive cervid facility in MN, the MN Board of Animal Health (MNBAH) has the lead role of response inside the facility, including further testing of captive animals in the infected facility and determining the source population. The MNDNR will determine if wild cervids in the surrounding area are infected with CWD by conducting surveillance in the immediate area, which may include hunter-harvested surveillance, special hunts, landowner shooting permits, and agency culling. Any confirmed positive cases of the disease in wild cervids will be managed with the same 4 goals as previously stated.

Introduction

Chronic wasting disease belongs to a family of infectious diseases, called transmissible spongiform encephalopathies (TSE), which alter the morphology of the central nervous system, resulting in a “sponge-like” appearance of this tissue. Chronic wasting disease only affects elk, mule deer (*O. hemionus*), white-tailed deer, and moose. The etiological agent of CWD is an infectious protein, called a prion. Incubation time of the disease, from infection to clinical signs, can range from 1.5 to nearly 3 years. Clinical signs are non-specific and may include a loss of

body condition and weight, excessive salivation, ataxia, and behavioral changes. There is no known treatment or vaccine for the disease and it is always fatal.

Chronic wasting disease was first discovered in captive mule deer in 1967 and then recognized in captive white-tailed deer and elk in 1978. The disease has been diagnosed in captive cervid populations from Nebraska, Oklahoma, Kansas, Montana, Colorado, Wyoming, South Dakota, Wisconsin, New York, Michigan, and Minnesota, USA, and Alberta and Saskatchewan, Canada. Within wild populations, CWD was historically confined to free-ranging deer and elk in the endemic area of northeast Colorado and southeast Wyoming. However, CWD has recently been detected in western Colorado and within wild deer populations of Nebraska, Kansas, Wisconsin, Illinois, North Dakota, South Dakota, Utah, New Mexico, West Virginia, New York, and Virginia USA and Alberta and Saskatchewan, Canada.

The Centers for Disease Control (CDC) and other public health agencies have concluded there is no known link between CWD and any neurological disease in humans (MaWhinney et al. 2006). However, both the CDC and the World Health Organization recommend that no part of a known positive animal should be consumed by humans. Additionally, there is no evidence that CWD can be naturally transmitted to species other than deer, elk, or moose.

Experimental and circumstantial evidence suggest that transmission of the disease is primarily through direct contact with infected animals or their infective saliva or excrement (Safar et al. 2008). However, persistence of prions in the environment and resulting indirect transmission has been shown to occur (Miller et al. 2004, Johnson et al. 2007, and Maluquer de Motes et al. 2008). Incubation time of the disease, from infection to clinical signs, can range from 1.5 to nearly 3 years, though infected animals have been shown to shed prions in their feces up to a year before showing signs of illness (Tamgueney et al. 2009).

DNR Approach to CWD Management

To date, CWD has been diagnosed in 3 captive elk herds and 1 captive white-tailed deer herd within the state of Minnesota, but has never been detected in a wild cervid. Two of the elk herds (Stearns and Aitkin counties) were discovered in 2002 and depopulated and no additional CWD positive animals were found. In spring 2006, a captive white-tailed deer was found infected with CWD from a mixed deer/elk herd in Lac Qui Parle County. That herd was also depopulated without additional infection being detected. However, over 40 additional premises within the state were impacted as a result of trace-forwards and trace-backs conducted by the MNBAH. Currently, all of these herds have undergone surveillance protocols; no further CWD-positive animals were detected. In early 2009, a third captive elk herd (Olmsted County) was found infected with CWD and the MNBAH determined there was an apparent longstanding infection within the herd.

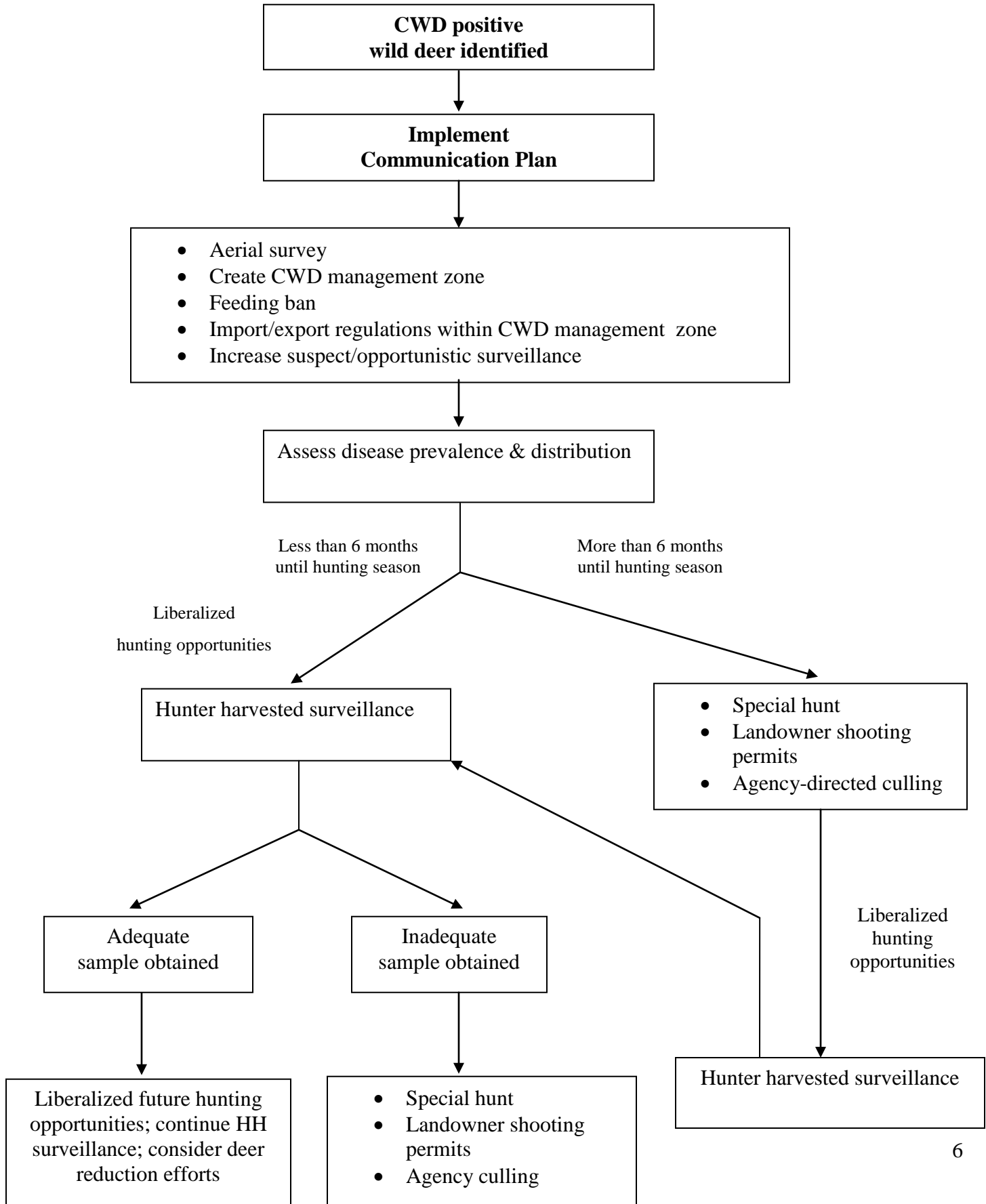
In response to the discovery of CWD in wild Wisconsin white-tailed deer and the first Minnesota CWD-positive captive elk herd in 2002, the MNDNR developed a comprehensive wild deer CWD monitoring program. This included surveillance of targeted animals (e.g., suspect or potentially sick deer exhibiting clinical signs or symptoms consistent with CWD), opportunistic surveillance (e.g., vehicle-killed deer), and hunter-killed deer surveillance. From 2002–2004, nearly 28,000 deer were tested for CWD statewide with no positive results. Following completion of the statewide surveillance, the MNDNR scaled back surveillance efforts and sampled animals in response to elevated risk factors (e.g., detection of CWD positive animals in captive cervid farms in Minnesota, or proximity of positive CWD cases in wild deer in neighboring states). Since 2004, an additional 5,200 hunter-harvested deer and over 500 targeted or opportunistic deer have been tested for CWD, with no positives detected. The

MNDNR will continue to monitor for the presence of CWD through targeted surveillance, and will revisit the need to sample hunter-killed and opportunistic deer if the disease is detected in captive or wild cervids in the future.

If CWD is detected in wild deer in Minnesota, the MNDNR has identified 4 primary goals of managing the disease:

- 1) Determine and monitor the prevalence and geographic distribution of CWD in the infected area.
- 2) Prevent or minimize further spread and new introductions of the disease.
- 3) Support and conduct applied research on CWD and its epidemiology.
- 4) Provide accurate and current information about CWD to the public, constituent groups, and agency personnel.

CWD Contingency Plan for MNDNR Wildlife Staff



Response Plan to a CWD Positive Wild Cervid

In the event that CWD is identified in a wild cervid in MN, the following activities will occur as quickly as possible, regardless of the time of year the discovery is made:

- Complete a survey in the immediate area where the CWD-positive cervid was detected to determine cervid density and distribution.
- Create a CWD management zone, the size of which will depend on the locations and distribution of infected cervids as well as the density, distribution and seasonal movements of the local cervid population.
- Implement a cervid feeding ban, which at a minimum should include the entire CWD management zone.
- Prohibit the export of cervid parts from within the CWD management zone, including urine.
- Implement active opportunistic surveillance (e.g. vehicle-kill surveillance) within the CWD management zone.
- Increase targeted surveillance efforts within the CWD management zone.

Following these initial steps, the prevalence and spatial distribution of the disease will be assessed through the sampling of wild cervids. Sampling will include the extraction of medial retropharyngeal lymph nodes, sex and age determination, and recording a precise kill location. All samples will be inventoried, entered into a database, and sent to the University of Minnesota's Veterinary Diagnostic Laboratory for enzyme-linked immunosorbent assay (ELISA) testing. Positive samples from ELISA testing will be further confirmed using immunohistochemistry testing at the National Veterinary Services Laboratory in Ames, IA.

The sampling method will be dependent upon the timing of the discovery in relation to the next upcoming hunting season. If there are fewer than six months until the next hunting season, then hunting opportunities will be liberalized and hunter-harvested surveillance will be used as the primary method of determining the disease prevalence and spatial distribution. Regulations will mandate the presentation of the carcass of any cervid harvested within the CWD management zone at an official big game registration station or officially designated site within the CWD management zone. If an adequate sample is obtained, then the hunter-harvested surveillance will become an annual occurrence designed to monitor changes in the spatial distribution of the disease. Hunting opportunities within the CWD management zone will be liberalized (through the use of special seasons and increasing the amount of available licenses or permits) to increase harvest and ensure adequate numbers of cervids are available for sampling. If hunter-harvested surveillance is unable to provide an adequate estimate of disease prevalence and spatial distribution, the MNDNR will consider options to collect supplemental samples. These options will include, but not be limited to, designating special hunts, landowner shooting permits, and agency-directed culling. Following annual surveillance, locations of positive animals will be evaluated and the boundaries of the CWD management zone will be adjusted, if necessary.

If there are more than six months between the discovery of a CWD positive wild cervid in MN and the next hunting season, the MNDNR will assess disease prevalence and spatial distribution through the use of any or all of the following tools: designating special hunts, landowner shooting permits, and agency-directed culling in addition to opportunistic and targeted surveillance. These efforts will be followed up by liberalized hunting opportunities and hunter-harvested surveillance during the next fall hunting season.

Long-Term Management Response

Wildlife disease control strategies need to be based on an understanding of specific disease etiology and epidemiology. Where infectious diseases exist at a significant prevalence over a wide spread areas, they may be impossible to eliminate from wild populations. CWD has an extended incubation period and coupled with its ability for lateral transmission and environmental contamination, once CWD is endemic in wild deer in MN, the disease may realistically only be managed to minimize its impacts.

Several states across the country have discovered CWD and implemented varying management plans. No single state has been successful in eliminating the disease from wild cervids once it has become endemic. The key factor is the level of infection determined in the cervid population at the time of initial detection. For example, when Wisconsin first discovered CWD in wild deer in the southwestern part of the state, it was assumed to be a recent introduction of the disease and management strategies initially focused on disease eradication. However, subsequent surveillance revealed that the disease was already widespread at the time of discovery. After nearly a decade of unsuccessful eradication efforts, WI has now declared CWD endemic in that region of the state, and disease prevalence and distribution continues to increase. After spending approximately \$30 million to combat the disease, including testing over 152,000 deer (1,172 deer have tested positive), CWD is present in two regions of the state and increasing in prevalence at a rate of 4% per year. While the effect of CWD on the wild deer population in Wisconsin is not expected to be detrimental over the next decade, studies from Colorado and Wyoming demonstrate the disease ultimately can reduce deer populations. Prevalence in adult males on winter ranges in CO more than doubled within a 6-year period,

reaching levels of 25-40%, and researchers concluded that high prevalence and low survival of infected deer was sufficient to have caused a population decline (Miller et al. 2008).

In contrast to WI's situation, New York discovered CWD in wild deer that were geographically associated with a CWD-positive captive cervid facility. Initial surveillance in 2005 indicated <0.1% prevalence in wild deer surrounding the captive farm (only one positive deer was found) and subsequent surveillance efforts have failed to detect more positives in the wild. In New York's situation, the swift response taken by the wildlife agency appears to have occurred prior to CWD becoming endemic in the population. Their response included agency culling and enhanced opportunistic, targeted, and hunter-harvested surveillance efforts, designed to detect the disease and establish aggressive management strategies that may be limiting its spread.

Based upon the current understanding of CWD in free-ranging cervids, eradication of the disease, once established as an endemic infection in the wild population, is not a realistic management objective within the infected area. However, as New York's experience has shown, if the disease is detected in wild cervids before it has become endemic in the area, an aggressive approach may help limit its spread. Research in disease transmission, susceptibility to infection, and management strategies continues in many states.

The MNDNR has chosen an adaptive management strategy, allowing flexibility to alter disease management activities depending on effectiveness of the methods applied and future research results. This plan provides for evaluation and monitoring of the prevalence and extent of CWD infection and for adjusting management strategies based on an evaluation of the results and the effectiveness of the strategies employed.

What the Discovery of CWD Means for Minnesota's Hunters

The CDC has concluded there is no link between CWD and human health risk. Hence, there is no information to suggest that hunters should abandon their traditional hunting areas or modify their hunting patterns if CWD is detected in wild deer. Ultimately, deer hunters will be an integral component of the response plan and deer population management.

Hunters can expect increased surveillance throughout the CWD management zone at designated deer registration stations. The testing will be provided free of charge to hunters and will be flexible enough to accommodate sampling during all deer seasons (archery, firearm, and muzzleloader). The discovery of CWD in wild deer will have an impact on deer numbers and hunting opportunity. In the short-term, there may be an expansion of opportunity in the form of special hunts and more liberal bag limits. In the long-term, hunters can expect fewer deer as densities must be kept low to minimize disease spread. There will also be more regulations regarding the import/export of deer carcasses and parts, and while recreational deer feeding does not only apply to hunters, it will be banned in the CWD management zone as well.

Response Plan to a CWD Positive Captive Cervid

If CWD is detected in a captive cervid facility in MN, the MNBAH has the lead role in managing the disease outbreak, including further testing of captive animals in the infected facility and determining the source population. The MNDNR will oversee surveillance efforts of wild deer surrounding the area. The following activities will occur as quickly as possible, regardless of the time of year the discovery is made:

- Complete a survey to determine deer populations and locations

- Implement a cervid feeding ban until surveillance in wild deer has been completed (area at minimum would encompass a 15 mile radius around the farm using major definable boundaries)
- Establish a CWD surveillance zone around the captive cervid facility
- Implement active opportunistic surveillance (e.g. vehicle-kill surveillance) within the CWD surveillance area
- Increase targeted surveillance efforts within the CWD surveillance area

Following these initial steps, a surveillance strategy will be designed to determine if CWD is present in the wild cervid population. The sampling method will be dependent upon multiple factors, such as the deer density and distribution surrounding the positive farm, the history of wild deer surveillance in the area, the compliance of the farm to regulations intended to minimize CWD transmission risks, and the timing of the discovery relative to the next hunting season. After evaluating each of these factors, the decision will be made whether to use hunter-harvested surveillance or other options such as special hunts, landowner shooting permits, or agency culling as a disease detection method. If a positive wild cervid is identified, the MNDNR will initiate the response plan to a CWD positive wild cervid. If there is no detection of CWD, the MNDNR will continue hunter-harvested surveillance in the area for three consecutive years and then reevaluate the risk and determine if continued surveillance is necessary. Targeted surveillance, in the area and statewide, will continue.

Applied Research

Management of CWD will require a more thorough understanding of the disease, including how it is spread. The MNDNR will support and conduct, on a priority basis, applied research that will facilitate continued expansion of knowledge of CWD. The MNDNR will

continue to monitor research that is occurring in other states and countries on CWD and other TSEs to ensure the most current and comprehensive data are available. Research should be aimed at improving the management of the disease. Specific research objectives may include:

- 1) Research on the epidemiology and population effects of CWD on Minnesota's wild deer population.
- 2) Research on deer movement in the local deer population.
- 3) Research to evaluate the effectiveness of the specific management strategies.
- 4) Construction of epidemiological models to better predict how CWD will behave on the landscape.

Information Dissemination

Chronic wasting disease is of interest to the local, national, and international communities. As the public agency charged with managing CWD in Minnesota's wild deer population, the MNDNR has an obligation to provide timely, complete, and accurate information about all aspects of the disease to the public. To ensure effective communication with the general public, constituent groups, and the media about CWD, the MNDNR will activate and follow a communication plan. This may include updates on MNDNR's website, news releases, brochures, articles in local newspapers or magazines, and public meetings or informal workshop and with the Minnesota Department of Health, Minnesota Pollution Control Agency, and University of Minnesota to get information to public on health concerns related to CWD.

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