

South Dakota Chapter of The Wildlife Society

Position Statement on Chronic Wasting Disease

The South Dakota Chapter of The Wildlife Society intends to consider and adopt a position statement on **Chronic Wasting Disease**. By request of a Chapter member and the Executive Board, this statement was developed and reviewed extensively by the Board and several selected Chapter members. Adoption of the statement will be discussed at our business meeting in Aberdeen. If you have strong opinions or feel changes in the statement are necessary, please forward them to Art Smith (605.773.7595, art.smith@state.sd.us) to help initiate discussion at the business meeting. Thank you.

Chronic wasting disease (CWD) is a transmissible spongiform encephalopathy that affects deer (*Odocoileus* spp.) and elk (*Cervus elaphus nelsoni*) and was first recognized in 1967 by researchers studying captive mule deer (*O. hemionus*) in Colorado (Williams and Young 1980). The disease was described in 1978 in white-tailed deer (*O. virginianus*) and Rocky Mountain elk at a research facility in Wyoming (Williams and Young 1980). To date, CWD has been diagnosed in captive cervid populations from Nebraska, Oklahoma, Kansas, Montana, Colorado, Wyoming, South Dakota, Wisconsin, and Minnesota, USA, and Alberta and Saskatchewan, Canada (United States Animal Health Association 2001, Canadian Food Inspection Agency 2002). At present, the epidemic focus of CWD in free-ranging cervids in the United States spans contiguous portions of northeastern Colorado southeastern Wyoming, and southwest Nebraska (Williams et al. 2002), referred to as the CWD endemic area, where up to 15% of mule deer and 1% of elk may be affected in localized management units (Miller et al. 2000). However, recent point source CWD occurrences in wild populations have been documented in Nebraska, Wisconsin, Illinois, South Dakota, and New Mexico. All wild cervid CWD occurrences outside the endemic area have been located in close proximity to captive cervid facilities with past or present infected animals except for a lone deer in New Mexico (B. Morrison, Nebraska Game and Parks, Lincoln, unpubl. data).

HISTORY OF CWD IN SOUTH DAKOTA

South Dakota captive cervid facilities are managed by the South Dakota Animal Industry Board (SDAIB) while free-ranging cervids are managed by the South Dakota Department of Game, Fish and Parks (SDGFP). CWD was reported for the first time in South Dakota in November 1997 at captive elk facilities in McPherson County; infected elk were then traced back to captive elk herds under one ownership in and adjacent to the Black Hills. Investigations determined that eight other captive elk facilities in the state had exposed elk. All ten facilities were quarantined by the SDAIB; seven were found to harbor CWD-positive animals. Since initiation of quarantines in 1997, five of the quarantined captive facilities were depopulated because of the presence of positive animals or the inability to move animals from the site for the 5-year quarantine period imposed by the SDAIB. Positive captive herds remained on two sites as part of a research project to develop a live test for CWD in captive elk. The last of the two research herds was depopulated in February 2001, and the state was declared free of CWD in captive herds (S. Holland, South Dakota Animal Industry Board, Rapid City public presentation, June 25, 2002). One of the previous CWD facilities was allowed to be repopulated for the purpose of determining if any environmental contamination by CWD would result in infection of the new elk.

SDGFP has been testing for CWD in wild cervids since 1997. In 2001, of 502 hunter-harvested deer and elk tested, a single, hunter-harvested white-tailed deer was determined to be positive for the disease (Jacques et al. 2003). This deer was harvested in the vicinity of Oral in Fall River County. SDGFP initiated deer collections in March 2002 on lands within 5 miles of the kill site. A total of 52 deer was collected; none was found to be positive for the disease. To determine the occurrence of CWD in wild deer that may have spread from a CWD-positive captive cervid facility in northwest Nebraska near the South Dakota border, 90 deer were collected along the Nebraska border in the western half of Fall River County. An additional 92 deer also were collected on the Nebraska side of the border by the Nebraska Game and Parks Commission in early spring 2002. All 182 deer tested negative for CWD. In August 2002, a previously unaffected captive elk facility adjacent to a previous CWD-positive captive elk facility in the southern Black Hills was found to contain CWD-positive elk. Also in the fall of 2002, a sick cow elk that was euthanized in the southern portion of Wind Cave National Park, and a deer killed by a vehicle in Rapid City were both found to be positive for CWD. Through June 2002, a total of 537 elk, 813 white-tailed deer, and 322 mule deer, which were all wild, hunter harvested animals, were sampled for CWD resulting in estimated overall disease prevalence of 0.001 % (95% CI = 0.0 to 0.007 %) for white-tailed deer, 0.0% (0.0 to 0.004%) for elk, and 0.0 % (0.0 to 0.011 %) for mule deer (Jacques et al. 2003). All of these prevalence rates fall far below the rates measured within CWD endemic areas.

WHAT IS CWD?

CWD is caused by a proteanaceous molecule called a “prion”. Infection of a healthy animal with the pathogenic prion results in a denaturing of proteins of the central nervous system, lymph tissues, and tonsil tissues. The denaturing results in a “sponge-like” appearance of these tissues when inspected microscopically. Infected individuals have from a few months to about 3 years before clinical signs of infection, such as loss of body condition and weight, excessive salivation, ataxia, and behavioral changes, are evident (Williams and Young 1980, Spraker et al. 1997, Miller et al. 1998). Cervids, such as deer and elk, are the only species affected by CWD; there is no known cure for the disease.

Public health officials and the Centers for Disease Control in Atlanta, Georgia, have found no link between CWD and any neurological disease in humans. There also is no scientific evidence that CWD can be naturally transmitted to animals other than deer and elk. However, the Food and Drug Administration has issued an order prohibiting rendering facilities from taking deer and elk parts from CWD-positive cervids or cervids from known CWD areas. Most renderers have ceased taking deer parts to preclude an expensive recall of products if a CWD-positive animal was processed.

TRANSMISSION AND SPREAD OF CWD

Current experimental and circumstantial evidence suggests that transmission of the disease is believed to be primarily through direct contact with infected animals (Dr. A. L. Jenny, Veterinary Services Laboratory, Ames, Iowa, pers. comm.). However, because of the possibility of persistence of the prion in the environment, transmission in the contaminated environment seems possible as well. Because of these probable modes of transfer of the disease, deer density may be important in CWD transmission (Gross and Miller 2001). Therefore, CWD would seem more likely to occur in areas where deer or elk are crowded or where they congregate at man-made feed and water stations.

Little is known about the rate of spread of the disease in wild populations. Dispersal movements of white-tailed deer in the Northern Great Plains can be considerable. Kernohan et al. (1994) documented a dispersal movement of 213 km for a yearling male that traveled from Sand Lake National Wildlife Refuge to Devils Lake, North Dakota, and yearling males at Lower Brule Sioux Reservation moved up to 70 km from the site of marking to just north of Philip, South Dakota (S. Grassel, Lower Brule Tribal Fish and Wildlife Dept., Lower Brule, SD, unpubl. data). A radio-collared adult female moved 205 km from Redwood Falls, Minnesota to Oldham, South Dakota (T. J. Brinkman, South Dakota State University, Brookings, unpubl. data). Elk in the Black Hills also move considerable distances. Bauman (1998) documented movement of a male elk radio collared in Wind Cave National Park west to Pleasant Valley approximately 13 km. The home range of one of these animals was estimated to be from 186 to 243 km², which represents about 3% of the South Dakota Black Hills.

Laboratory tests for CWD in deer and elk use a microscopic examination of the brain stem, which requires the animal to be dead. Only a few laboratories in the U.S. test for CWD, and with increasing numbers of samples, tests often take more than 2 months to be performed. In the early winter of 2002, an alternate test for surveillance purposes was approved that uses the retropharyngeal lymph nodes instead of the brain stem for elk, mule deer, and white-tailed deer. The turn-around time for test results is similar to that for brain stem testing. In addition, a tonsillar biopsy test has been approved for use on live mule and white-tailed deer (Wild et al. 2002). The tonsillar biopsy test is more useful for testing captive animals because to be used on wild animals, the individuals being tested would have to be held in captivity until test results became available.

In addition to the problems associated with testing live, wild animals, the sporadic nature and long incubation period make potential responses to reduce or eliminate the disease ineffectual. As nose-to-nose contact has been implicated as a likely source of transmission of CWD, elimination of all potential interactions between captive and wild cervids is imperative for disease control. Because of the tenacious innate behavior to breed, wild male cervids will likely attempt to enter captive facilities to interact with females during fall breeding seasons. Moreover, reports of escaped captive elk, and observations of exotic species (i.e., *Cervus nippon* and *Dama dama*, sika and fallow deer) in the wild in Gregory, Jerauld, and Day counties, indicate that captive facilities in South Dakota are currently unable to maintain separation between captive and free-ranging cervids.

RECOMMENDATIONS

The legal and illegal sale and transport of privately-owned captive cervids associated with the propagation and commercialization of cervids worldwide represents a potentially serious threat of accidentally introducing CWD and other diseases into previously uninfected free-ranging cervid populations. Thus, to prevent new outbreaks and to control current occurrences of CWD in South Dakota, the South Dakota Chapter of The Wildlife Society recommends that:

- 1. No permits be given out by the South Dakota Animal Industry Board for new captive cervid facilities statewide.**

There are too many unknowns, such as modes of CWD transmission, ability of prions to persist in the open environment, and wild deer and elk dispersal rates to confidently define the physical properties that would assure a captive cervid facility as being CWD free. Shortcomings in current testing techniques prevent realistic discrimination of live, wild animals that are infected with CWD but do not show clinical signs of the disease.

- 2. The South Dakota Animal Industry Board closely monitor depopulated CWD private facilities and enforce requirements for maintaining the facilities cervid-free.**

If infectious agents remain in the environment after depopulation of facilities, as has been suggested in captive facilities in Colorado and Wyoming (Spraker et al. 1997), restocking of infected sites would guarantee exposure of the animals through environmental contamination.

- 3. The South Dakota Animal Industry Board require all existing captive cervid facility operators to double fence those facilities with 10 foot high, elk proof fencing, inspect fences regularly, and enforce maintenance of the fences.**

Direct contact between infected and uninfected animals is a likely mode of disease transmission. Single fence designs or breached double fences are not capable of preventing direct contact. Elimination of all potential interactions between captive and wild cervids is imperative for disease control. Appropriate fencing design, coupled with regular examination and proper maintenance, would greatly diminish potential contact between free-ranging and captive cervids. Such a design should consist of two separate, parallel, 10 foot high fences constructed of elk proof fencing on cement reinforced posts with adequate spacing (6 foot minimum) between the fences to prevent animal-to-animal contact.

- 4. Because Recommendation 3 is based on limited knowledge of facility designs that will ensure the separation of captive and wild cervids, planning efforts should be initiated towards the research and development of best configurations and materials for double fence designs.**

Elimination of all potential interactions between captive and wild cervids is imperative for disease control. Natural occurrences such as fires, extreme snowfalls, floods, or falling trees and large branches have caused fence failures in the past. If infectious agents remain in the environment after depopulation of facility, those agents could potentially be transferred from captive facilities via precipitation runoff, and traditional fence designs would fail to eliminate exposure of free-ranging cervids to environmental contamination. At a minimum, fencing designs in use and potential movement of CWD contamination from captive facilities should be evaluated at all currently permitted sites in the state.

- 5. Research be initiated to determine captive and wild cervid densities that facilitate disease transference and cervid densities in and surrounding captive facilities be limited based on those findings.**

It is suspected that the disease can be transferred from infected to uninfected individuals through direct contact. Higher densities of animals may lead to increased direct contacts between individuals. More direct contacts between individuals may enhance the spread of the disease.

- 6. Public recreational feeding that concentrates wild cervids be discouraged.**

It is suspected that the disease can be transferred from infected to uninfected individuals through direct contact. Higher densities of animals may lead to increased direct contacts between individuals. More direct contacts between individuals may enhance the spread of the disease. Artificial feeding stations regularly congregate wild cervids at much higher densities than normally supported at natural feeding areas.

- 7. The South Dakota Animal Industry Board provide data on captive cervid facility placement, herd demographics, and cervid movements between facilities to the South Dakota Department of Game, Fish and Parks immediately upon renewal of existing permits or issuance of any new permits.**

Effective response to potential CWD outbreaks in free-ranging populations is hampered by limited data exchange on the existence of captive facilities. Full data exchange between these two management agencies would facilitate best disease surveillance planning and assist required facility oversights.

- 8. The South Dakota Animal Industry Board and the South Dakota Department of Game, Fish and Parks exchange all data on all CWD test results as soon as they are available.**

Effective response to potential CWD outbreaks in free-ranging populations is hampered by limited information exchange on the occurrence and prevalence of CWD in captive facilities. The presence and extent of CWD in wild populations surrounding captive cervid facilities should be an extra concern of the operators of these facilities. Complete data exchange on CWD test results will allow for rapid responses to potential CWD outbreaks and for consideration in prioritizing CWD surveillance areas.

- 9. South Dakota Department of Game, Fish and Parks continue surveillance efforts for CWD in free-ranging cervid populations statewide. Priority should be given to areas having current and former captive cervid facilities via data provided by the South Dakota Animal Industry Board.**

It is suspected that the disease can be transferred from infected to uninfected individuals through direct contact. It also is suspected that the prion can persist in the open environment, but it is unknown for how long. Little is known of the factors that initiate and diminish movements of wild cervids. Without knowing these answers with complete certainty, the likelihood of preventing disease spread in newly infected populations is low. Continued surveillance of known CWD-positive areas may help answer some of these unknowns.

- 10. Research be initiated to determine if environmental contamination exists in and around infected captive facilities and if possible, in areas of wild populations exposed to CWD.**

It is suspected that the prion can persist in the open environment, but it is unknown for how long. This is especially relevant if the persistence is longer than the current 5-year quarantine period, as is currently imposed by the South Dakota Animal Industry Board on CWD-positive captive cervid facilities. Appropriate surveillance and management planning require more knowledge on the ability of prion persistence in open environments.

This also has implications for the safe disposal of deer carcasses and meat processors and rendering companies accepting full cervid carcasses.

11. Transportation and possession of whole carcass or carcass parts of white-tailed deer, mule deer, or elk from areas within states or provinces with documented occurrences of CWD in wild and captive populations be prohibited except for:

- meat that is cut and wrapped either commercially or privately,
- quarters or other portions of meat with no part of the spinal column or head attached,
- hides with no head attached,
- clean (no brain or eye tissue attached) skull plate with antlers attached,
- antlers and upper canine teeth, and
- finished taxidermy heads.

Prions appear to be the infectious CWD agent and are found in the central nervous system, lymph tissues, and tonsil tissues. It is suspected that the prion can persist in the open environment, but it is unknown for how long. Appropriate surveillance and management planning require more knowledge about the transference from infected to uninfected individuals, and on the ability of prion persistence in open environments. As a precaution, tissue known to contain prions should be restricted from entering the state from areas known to be exposed to CWD.

12. A federally approved CWD testing facility be developed in South Dakota

Currently there are only a few laboratories in the U.S. that test for CWD and tests often take more than 2 months to be performed. With more states developing active surveillance programs, the number of samples will also increase, which will likely lengthen the time between sample submissions and the return of test results. An in-state testing facility would provide test results much quicker, thereby allowing rapid responses to potential CWD outbreaks.

13. The South Dakota Department of Game Fish & Parks explore the possibility of creating a position for a wildlife veterinarian within the State of South Dakota.

14. The SD Animal Industry Board, The South Dakota Department of Game Fish & Parks, Tribal Fish and Wildlife agencies, and Federal land management agencies coordinate on the management and control of CWD.

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