Plan for Assisting States, Federal Agencies, and Tribes in Managing Chronic Wasting Disease in Wild and Captive Cervids

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Task Force Representation

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- Agricultural Research Service
- Animal and Plant Health Inspection Service
- Cooperative State Research, Education, and Extension Service
- Forest Service

U.S. Department of the Interior
- Bureau of Indian Affairs
- Bureau of Land Management
- National Park Service
- Fish and Wildlife Service
- Geological Survey

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Wisconsin Department of Natural Resources
Wyoming Game and Fish Department
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I. INTRODUCTION

In the late 1960s, a clinical syndrome seen in captive mule deer came to be known as "chronic wasting disease" (CWD). This syndrome was identified as a transmissible spongiform encephalopathy (TSE) in 1978. In the early 1980's, CWD was identified in free-ranging deer and elk in northeastern Colorado and southeastern Wyoming. In May 2001, CWD was confirmed in a free-ranging mule deer that had been harvested in November 2000 in the southwestern corner of Nebraska adjacent to Colorado and Wyoming. In this so-called "endemic area" of some 20,000 square miles, infection rates range from more than 10 percent of white-tailed and mule deer in the most infected areas to 1 percent or less of all elk in the endemic area. CWD has also been diagnosed in farmed elk herds. The first report of a farmed elk with CWD came from Saskatchewan in 1996, and in 1997 another case was identified on a South Dakota elk farm. Since that time, additional positive farmed elk herds have been found in South Dakota, Nebraska, Colorado, Oklahoma, Montana, Kansas, and Alberta (most of these herds have been depopulated).

For decades, CWD was considered a western concern, because it had been found in captive or free-ranging cervids (a member of the deer family) only in States west of the Mississippi River. However, recent events including the recognition of the presence of CWD in free-ranging deer in Wisconsin and New Mexico, and the transport of CWD-exposed captive elk to numerous States across the country clearly show that CWD must be dealt with on a national basis. An effective national control program for CWD in free-ranging and captive cervids is urgently needed to prevent its introduction into new areas and to eliminate or control CWD where it already occurs. Several States have established CWD control programs in free-ranging and captive cervids, and State agencies and universities have developed much of the current information regarding the disease. However, lack of resources in some States and inconsistencies among the approaches and standards for disease control underscore the need for assistance in developing an effective national approach to CWD control. Federal assistance can help resolve these problems.

The Federal government must cooperate with State wildlife management and animal health agencies, Tribal governments, and non-governmental producers and wildlife organizations to develop synergistic CWD research and control programs. There already is a history of State-Federal cooperation in dealing with CWD in both captive and free-ranging cervids; this relationship must be expanded to include additional Federal and State agencies that have existing authority, responsibility, and capability to control CWD. A number of Federal agencies within the U.S. Department of the Interior (DOI) and the U.S. Department of Agriculture (USDA) have responsibilities for issues presented by CWD.

State, Federal, and Tribal agencies have statutory authority to respond to CWD in infected farmed/captive cervids and wildlife. In exercising the regulatory authority found in the *Code of Federal Regulations* and the *United States Code*, Federal agencies must comply with the National Environmental Policy Act. When Federal agencies need to respond quickly with emergency management actions, they have options of using categorical exclusions, environmental assessments, or alternative arrangements with the Council of Environmental Quality. If the proposed emergency actions are expected to have significant impacts on the environment, then an environmental impact assessment would also be conducted as a follow-up action.

The primary Federal role will be to provide coordination and assistance with research, surveillance, disease management, diagnostic testing, technology, communications, information dissemination, education, and funding for State CWD programs. Federal agencies will provide tools and financial assistance to States and help develop consensus-based approaches to CWD control. In May 2002, an

effort to address CWD issues was initiated among USDA, DOI, and State wildlife management and agriculture agencies. A CWD Task Force was formed to ensure that Federal and State agencies cooperate in the development and implementation of an effective national CWD program. This report presents the plans of the Task Force to coordinate Federal and State efforts and identify necessary actions in support of State, Federal, and Tribal CWD control efforts. A subsequent plan will be developed to implement the recommendations of this report.

II. WORKING GROUPS AND ISSUES:

Communications Working Group: The goal of this working group is to create an effective mechanism for making scientific information accessible to all parties dealing with the CWD issue. USDA, DOI, and other Federal and State agencies have been engaged in ongoing communications efforts as part of their CWD activities. The communications plan is not meant to reflect all the activities of all the entities involved in this issue, but to outline a national program of outreach on this disease and its management to significant target audiences.

Scientific and Technical Information Dissemination Working Group: The goal of this working group is to provide a mechanism for making CWD information accessible to all State and Federal agencies and others involved in the CWD problem. The plan calls for the creation of uniform standards for CWD data collection and transfer, making available hardware, software, and data management support to States, and providing for information sharing among all State and Federal groups dealing with CWD. The primary goals of this working group are to define strategies for dealing with CWD by: 1) providing access to common scientific and technical information in a partner-based data system; 2) integrating CWD data from State and Federal agencies, and others into the National Biological Information Infrastructure (NBII) Wildlife Disease Information Node (WDIN); 3) working with States to create data standards that will allow interoperability with existing CWD data sets; and 4) providing wildlife managers and veterinarians with near real-time access to CWD data and other critical information.

Diagnostics Working Group: The goals of this working group are to: 1) develop better tests for CWD, both postmortem and live-animal, understanding that the tests must be accurate, reasonably fast, and inexpensive; 2) produce a survey of available laboratory capacity for processing CWD samples and a projection of necessary capacity to support effective CWD programs; 3) establish a consensus standard on how to accredit laboratories to conduct CWD testing; and 4) describe the time requirements for obtaining results from the various tests so that CWD programs can incorporate accurate assumptions about the "turnaround time" needed.

Disease Management Working Group: The goals for this working group are to identify best practices for herd management techniques that can help prevent the introduction of CWD into a herd, and prevent CWD spread from an infected herd. The group also addressed how to prevent contact between free-ranging and captive animals, safe carcass disposal, herd population data management, animal identification, effectiveness of indemnity, culling versus eradication, and other issues.

Research Working Group: The goals of this working group are to identify and prioritize critical research needs in areas such as live-animal tests, genotyping, transmissibility, and bioassays. It also worked to identify methods to detect the presence and persistence of the agent in the environment and to develop methods for decontamination. The group also addressed epidemiology, disease management, and human dimensions of CWD.

Surveillance Working Group: The goal of this working group is to develop consensus standards for adequate surveillance in both captive and free-ranging herds, and describe best practices and techniques for targeted, hunter harvest, and outbreak surveillance.

III. ACTION PLANS:

A. Communications

1. Overview

This communications plan outlines a national program of public information outreach on CWD and its management to significant target audiences that reflects the breadth and depth of the entities dealing with this disease. The plan compliments ongoing Federal, State, Tribal, and local communications efforts as a part of their CWD activities. A key element of the plan will be developing and sharing information. The actions in this plan should be coordinated by a public affairs specialist working with all agencies and people involved in CWD research and management. Some projects may be best undertaken by individual entities and those decisions would be made by the main communications committee as needed, in cooperation with the States.

2. Goals

- Goal 1: Increase awareness of Federal and State CWD efforts.
- Goal 2: Educate target audiences about CWD.
- Goal 3: Provide accepted and updated scientific information.
- Goal 4: Provide updates on advances in CWD management and control.
- Goal 5: Provide scientific and technical training information to State, Federal, and Tribal employees on CWD management and surveillance methods.

3. Audiences

The target audiences for these activities include the following, in impacted or potentially impacted jurisdictions, and eventually in all States with active surveillance:

- Media;
- State and Federal cooperators such as wildlife, conservation, land management, agriculture, forestry, and natural resource agencies;
- Consumptive and non-consumptive users of wildlife and associated businesses;
- Captive cervid industry; scientific community, general public; and
- State and local officials, policy makers, Tribes, and communities.

The principle message of this communications campaign is that all concerned entities are working together to coordinate efforts to control and manage CWD in free-ranging and captive populations of cervids and where possible to eradicate the disease or prevent its spread.

4. Actions

Communications activities by many agencies have been ongoing; the list below is exemplary of work that has already been done. Activities are divided into three main categories: production of information materials, identification of events, and distribution of information.

- Action Item 1 – Production of Materials: Fact sheets on general CWD disease information, CWD funding, and Federal, State, and Tribal actions to address CWD will be updated and expanded to include information from all reliable sources. Other relevant fact sheet topics will be developed (including fact sheets on individual State programs and responses for CWD) as needed.
- Action Item 2 – Events and Distribution of Information: Working in concert with States, radio and public service announcements will be distributed to all affected States and Tribes with copies to all cooperators. Also provided are program management and training videos, and disease identification field guides. Information packets will be prepared and mailed to all agriculture extension agents and State Departments of Agriculture and Natural Resources agencies.

B. Scientific and Technical Information Dissemination

1. Overview

Management and dissemination of scientific and technical information is critical to States, Federal agencies, Tribes, and other groups involved in CWD issues. Although these entities will collect important data for their own use, there will be significant opportunities for resource sharing as well as assistance for data management and transfer, allowing analyses to be conducted on a nationwide basis. This Information Plan provides for the creation of uniform standards for data collection and transfer that will facilitate these activities. The availability of one system rather than multiple systems that may not be compatible with each other will allow economies of scale for the proposed activities to be undertaken at a national level. States that have not yet incurred expenses in developing a local system will be provided with internet-based applications, and States with pre-existing systems will also receive assistance. Further, data and information from all parties will be handled to assure appropriate intellectual property rights and confidentiality.

The U.S. Geological Survey's NBII will be used to accomplish the efforts outlined in this plan. The NBII is an electronic information network that provides timely and effective access to biological data and information on the nation's plants, animals, and ecosystems through "Nodes," which can be used for scientific activities, education, and informed decision-making. Since NBII technical and informational infrastructures are already in place, the new NBII Wildlife Disease Information Node (WDIN) can serve as an effective mechanism for providing access to Internet-based CWD information. Although the WDIN was initially established as a prototype to focus on CWD data from Wisconsin collaborators and the National Wildlife Health Center located in Wisconsin, this Node will be expanded to meet the needs of this plan. Most data will be provided by the States; this Node will explicitly support State managers in addressing CWD data needs. The Node will also provide links to other available CWD databases and allow "one stop shopping" for technical information, including geospatial information, research, monitoring, and surveillance results. This will allow State and Federal agencies, Tribes, and the public to obtain near real-time data on CWD. The target audience and message are identical to those of the Communications Plan.

2. Goals

To define strategies for dealing with CWD by:

- Goal 1: Providing access to common scientific and technical information in a partner-based data system;

- Goal 2: Integrating CWD data from State and Federal agencies, Tribal and land managers, and other sources into the WDIN;
- Goal 3: Working with States to create data standards that will allow interoperability with existing CWD data sets and provide confidentiality of data to data providers as needed;
- Goal 4: Providing wildlife managers and veterinarians with near real-time access to CWD data and other critical information, including available test results, Geographic Information System (GIS) analyses of CWD patterns, and predicting areas of potential risk;
- Goal 5: Providing a database system that can be used by all agencies for their own local use, but also as a central repository for nationwide analyses.

3. Actions

A repository for data will be collected through State and Federal agency CWD research, monitoring, and surveillance programs so that analyses can be conducted on a nationwide basis. Users will benefit from an integrated information system on all aspects of CWD and other relevant TSE information for CWD, including biology, diagnosis, and control issues. In all activities, priority will be given to the transfer of information resources and funding to create an integrated CWD data system.

Action Item 1 - Data Storage

- Establish a robust database that can accommodate testing results as well as research, monitoring, and surveillance data from State and Federal agencies;
- Develop a data import system to allow State and Federal agencies to enter their current and archival data;
- Develop data collection and management standards in cooperation with State and Federal agencies;
- Develop a certification and quality control system;
- Provide to States a system for tracking CWD samples from collection through laboratory testing.

Action Item 2 - Integrated Information System

- Conduct a thorough literature review focusing on CWD;
- Assemble information on biology and management of wildlife species at risk for developing CWD;
- Collect and assemble State, USDA, and other wild and captive herd data and make it Web accessible;
- Create a Web based system that will integrate information collected above;
- Catalog and provide Internet links to other Federal, State, and non-government organization CWD information resources, including scientific libraries.

Action Item 3 - Long-term Activities

- Maintain databases and services described above;
- Integrate all available State and other data into the NBII WDIN.

C. Diagnostics

1. Overview

CWD assays currently in use and development are, and will be, validated only for epidemiological or disease control purposes. Immunohistochemistry (IHC) will be the source of validated results in the

short-term and will be the gold-standard test long-term. High-throughput assays may be available for use in laboratories (not animal-side) in the fall 2002 hunting/control season on an experimental basis, but will not be validated prior to the season. The assays may be validated for use by early 2003, allowing retrospective use of their results. Laboratory capacity should be sufficient using approved State/university laboratories as part of a network. However, as the volume and rate of sample submission is uncertain, reporting results may be delayed. Laboratories should be approved first to use the standardized IHC, which will allow them to assist in validating, and then use high-throughput assays. Samples collected may exceed diagnostic needs until research will assist in the selection of tissues for optimum testing; in turn, the samples may be applied to further research and management strategies. Funding for testing populations, new assay validation, and laboratory space/equipment is needed.

2. Goals

- Goal 1: To provide reliable information on the disease and infection status in free-ranging and captive cervids for herd certification programs, epidemiological investigations, and control and management activities. This requires laboratory capacity sufficient to run a meaningful number of validated, standardized assays relative to the sampled population, in a useful timeframe.

3. Actions

- Action Item 1 – Establish sufficient testing capacity: Official testing needed in the next 12 months and beyond can be accomplished by establishing and supporting (including by direct funding of laboratory testing and equipment) a network of the approximately 15 well-established State/university veterinary diagnostic laboratories already selected or currently being selected for standardized IHC testing. Fifteen laboratories is a goal for January 2003; additional laboratories will be added during 2003. Sample prioritization will be critical and should be agreed upon in principle prior to fall 2002. This could be implemented by the National Veterinary Services Laboratories either as the testing contract holder or laboratory network coordinator in collaboration with submitting State authorities and testing laboratories.
- Action Item 2 – Continue Using IHC: Approximately 100 assays/day/machine can be run using IHC. The use of 15 laboratories with two machines each would allow 750,000 samples per year to be tested, or the estimated 177,000 surveillance samples to be tested in three months for rapid management action.
- Action Item 3 – Assure Sample Quality: Captive cervid owners and the general hunting public should not collect samples for "official tests." Sample collector training should be professionally conducted. Laboratory technicians must be vigilant in identifying and rejecting inappropriate samples. Laboratories not performing IHC may contribute to the testing strategy through quality sample preparation. If a laboratory's testing protocol uses high throughput assays only for some samples, any questionable sample should be subjected to IHC.
- Action Item 4 – Assist in Validation and Apply High Throughput Screening Tests: A variety of high throughput assays are currently being developed or validated with the intent of commercializing them. The evaluation of high-throughput TSE tests already used for bovine spongiform encephalopathy in European cattle should be completed rapidly. A tissue repository should be established from diagnostic samples to evaluate proposed tests. Some IHC laboratories will run pre-license high-throughput assays in parallel, providing validation data, and may use the new assays as their primary screening assay post-license. Fifteen laboratories running high throughput assays could perform 7.5 million tests each year.

- Action Item 5 – Assist in Addressing Other Areas of Testing: Development and validation of a live-animal CWD test may result from current and new research or from testing the likely target tissue from this season's carcasses collected as diagnostic samples. New assays may be applied to research and management questions related to other animal samples.

D. Disease Management

1. Overview

The goals of CWD management are to prevent the introduction of CWD into new areas and to eliminate CWD where it presently occurs. Elimination is most feasible in captive populations. A proposed USDA program has been designed with the States to accomplish that goal. In the wild, elimination is most feasible with early detection of new disease foci. With new foci, there may be time to stop disease transmission, reduce movement of infected animals, and minimize environmental contamination. If elimination is not possible, the goal is to control and limit the spread of the disease. Control and limitation of the disease's spread is most appropriate in endemic areas where the disease has maintained itself for years. Currently, the States, DOI, and USDA are actively pursing this goal.

A key element in the management of this disease is the development of coordinated, science-based CWD plans tailored individually to meet the needs of State, Tribal, and Federal agencies. Ideally, such plans would include both farmed and free-ranging populations, include all stakeholders, and cover multiple jurisdictions (especially when jurisdictions share an affected population). Plans could follow a standard outline of basic components including: objectives, management tools, management of contaminated environments, monitoring of results, restoration plans, and budget. Plans would form the basis for funding, for public responsibility and accountability, and for measuring results. Because such coordinated plans may be difficult to prepare in a short timeframe, a process for immediate funding for initial response for newly identified outbreaks should also be available. It is anticipated that there will be approximately five new outbreaks each year for the next three years.

CWD management plans will vary depending upon such factors as length of time the disease has been present, affected species, population density, location, resources, and human dynamics. States and other entities may use different strategies for different combinations of these factors. The key challenge is to learn as quickly as possible how effective control or elimination strategies may be. As research knowledge provides new diagnostic and management tools, the challenge will be to continually improve CWD management strategies.

2. Goals

- Goal 1 – Prevention: To maintain a population or an area free from CWD.
- Goal 2 – Elimination: To remove CWD and prevent its reintroduction.
- Goal 3 – Maintenance: To keep CWD below a certain level of prevalence.
- Goal 4 – Containment: To keep CWD from spreading outside of an area.

3. Actions

Actions taken will vary with the individual situation and are presented here as potential components of a process rather in priority order.

- Action Item 1 – Disease Prevention: Entities without CWD should plan to prevent its introduction through movement restrictions, restrictions on baiting and feeding, risk assessments, population management, and information dissemination. Surveillance to allow early detection of the disease is essential in preventing inadvertent human-assisted or natural movement of affected animals.
- Action Item 2 – Management Techniques to Eliminate, Contain, or Control CWD: Where CWD has been identified, the following tools can be considered for use together or singly for use in a management response:

  Outbreak Surveillance: Surveillance establishes the prevalence, incidence, and distribution of the disease, and allows the evaluation of management actions.

  Population Reduction: Depopulation can be used for farmed cervids, or for free-ranging cervids in limited geographical areas. Reduction in population density can be used where CWD is already present or as a preventative measure. Targeted removal can reduce a specific subset of an affected population (such as yearling males that are naturally dispersing from a CWD area).

  Testing and Removal: Testing and removal can be used to remove CWD affected animals from a population. This approach may be appropriate only in limited situations.

  Therapeutics and Vaccines: These tools are not currently available. Much more research is required to develop these tools for use.

  Human Behavior: Restrictions on feeding or baiting of free-ranging cervids where appropriate, and regulations for the farmed cervid industry are all examples of management tools that may be used to control CWD.

  Habitat Modification: The manipulation of environmental factors could limit animal use of areas and potential exposure. Such tools may be useful in dealing with environmental contamination.

  Movement Restrictions: Agricultural and wildlife agencies should provide scientifically based recommendations for limiting animal movements to prevent the spread of CWD. Restrictions are already in place in some States (see Appendix I).
- Action Item 3 – Management of Farmed Deer and Elk: A proposed USDA program will restrict interstate movement in order to set basic minimum standards for State regulatory programs. The regulatory program provides certification status for producers who maintain herds for a minimum of five years with no evidence of the disease. Herd management plans are required for CWD positive and exposed herds. These plans include provisions for depopulation or quarantine, disposition of carcasses, decontamination, and future use of the premises. If animals are depopulated, the program provides indemnity.
- Action Item 4 – Carcass Disposal: Without an effective, rapid postmortem test, carcass disposal will remain a major element in increased surveillance or population reduction efforts. Rapid and accurate testing will permit presorting of carcasses for their most effective disposition. Federal funds may be used to purchase or lease capital-intensive equipment for disposal to be made available to States and other entities as needed.
- Action Item 5 – Monitoring, Measurement and Adaptive Management: Goals and measurement procedures should be developed in conjunction with coordinated management plans. Management actions should be monitored for results as well as for intended and unintended environmental impacts. Adaptive management approaches may prove to be effective in these activities.
- Action Item 6 – Environmental Decontamination: A major concern with CWD is the potential for indirect transmission through contamination of the environment through excretions, secretions, or the decomposition of infected animal carcasses. Management plans need to provide for decontamination as research provides tools and approaches.

- Action Item 7 – Restoration: A final phase of CWD management involves restoration of species and environment. Restoration is a critical part of gaining public approval for actions taken in controlling and/or eliminating the disease.

E. Research

1. Overview

Although State, Federal and university researchers have worked collaboratively to increase understanding of CWD since its discovery, there are significant knowledge gaps regarding the fundamental characteristics of this disease. These gaps impede the development of plans to control the disease, as effective management requires an understanding of the disease, its host, and human response to both. More research on the fundamental aspects of diagnostic methods, pathology, epidemiology of the disease, cervid ecology, and human dimensions is still needed. This research will be conducted through partnerships among universities, State, and Federal agencies that have demonstrated capacity to work on CWD. Key to controlling this disease will be the combination of research findings with an adaptive management approach that integrates monitoring of the disease and host, ecological modeling, and effective management actions.

2. Goals

- Goal 1 – Rapid Diagnostics: There is an urgent need for research to establish rapid diagnostic techniques in live animals, carcasses, and environmental samples.
- Goal 2 – Biology and Pathogenesis: Little is known about the biology and pathogensis of CWD, including how the disease agent enters the animal, how it multiplies in the body, how it causes disease, and how it is transmitted.
- Goal 3 – Management and Ecology of the Disease and the Host: There is a need to understand the interactions between host species ecology and CWD dynamics, and the implication of these interactions for disease management.
- Goal 4 – Human Dimensions: A better understanding of the attitudes of impacted publics is needed to develop effective communication/education strategies and disease management programs.

3. Actions

- Action Item 1: Evaluate existing diagnostic tests for accuracy and utility; improve accuracy, speed, and capacity of diagnostic tests, and establish a standardized yet flexible national sampling protocol for testing; develop tests that provide early detection of disease; develop a live animal test that is cost effective and can be applied in the field; and assess the feasibility of tests for environmental contamination.
- Action Item 2: Conduct research into the biology and pathology of CWD. Prioritized needs include: 1) describing the pathogenesis of CWD; 2) determining if different strains of CWD infect different cervids; 3) determining which species are susceptible to CWD, including cattle; 4) determining the routes of exposure, the rate of transmission, and the amount of agent needed to cause infection; 5) investigating the contribution of genetics to CWD susceptibility among cervid populations; and 6) developing prophylactic or treatment measures for both captive and free-ranging susceptible cervids.
- Action item 3: Conduct research into disease management and host ecology. Prioritized needs include: 1) developing and enhancing models of CWD dynamics; 2) evaluating host population

dynamics and dispersal and social behavior in relation to transmission; 3) developing a GIS that can elucidate patterns of disease–host population characteristics; 4) evaluating the effectiveness of CWD control or eradication strategies; 5) studying the ecological effects of reducing deer and elk populations in CWD affected areas; 6) determining persistence of the CWD agent in the environment; 7) developing methods to inactivate the CWD-agent in the laboratory and in the field; 8) correlating disease prevalence to cervid density; and 9) conducting research on methods of carcass disposal.

- Action Item 4: Conduct research into the human dimensions of CWD. Prioritized research needs include: 1) determining the attitudes, perceptions of risk, and information needs of affected human communities; 2) determining landowner and hunter willingness to participate in disease management programs; 3) determining the impact of CWD and CWD management on the economy and the social fabric of human communities; and 4) assessing communication and education strategies.

F. Surveillance

1. Overview

To find and monitor CWD in free-ranging populations, three types of surveillance are undertaken. Targeted surveillance is the collection of any cervid that exhibits clinical signs of CWD. This may be an important method on certain lands where harvest cannot easily be conducted. Hunter harvest surveillance is the collection of the heads of hunter-harvested cervids to test for CWD. Outbreak surveillance is the collection of specified numbers of animals to determine the rate of infection and the extent of the infected area identified through either targeted or hunter harvest surveillance.

The national surveillance plan for farmed cervid herds includes mandatory death reporting and CWD testing of all animals, except calves, that are slaughtered or die on the premises. The proposed farmed cervid surveillance program and the proposed surveillance program for wildlife are interdependent. Particular combinations of services will depend upon circumstances in each State. This plan will adjust services to support the particular needs and circumstances of CWD in each State or area.

Under the proposed program budget, USDA's goal is to begin its CWD eradication program from farmed elk and deer herds in the United States in fiscal year 2003. The proposed CWD program involves cooperative State programs with the major components for farmed elk and deer being: 1) surveillance, including diagnostic services; 2) indemnity for depopulated herds or animals; 3) certification for herds in which CWD has not been found; and 4) epidemiology and related services. As part of its surveillance program, the National Park Service (NPS) will continue its targeted surveillance and removal of cervids exhibiting clinical signs of CWD. NPS also will continue using live animal testing for deer in parks located in close proximity to confirmed CWD cases. DOI will cooperate with the States in hunter surveillance programs.

2. Goals

- Goal 1 – Sampling Plans: Develop sampling design that specifies numbers of animals to be sampled by area and year, and assist agencies with surveillance strategies.
- Goal 2 – Early Detection: For cervid populations and herds in which no infection has been detected, the primary surveillance objective is early detection of new CWD foci.
- Goal 3 – Determination of Prevalence Rates: For cervid populations in which infection has been detected, estimate CWD prevalence over time and space.

- Goal 4 – Epidemiological Investigations: Conduct surveillance to support research investigations and trace-back (tracing movement into the herd) or trace-forward (tracing movement out of the herd) efforts for the purpose of identifying transmission mechanisms.

3. Actions:

- Action Item 1 – Sample Collection for Disease Monitoring: Effective surveillance strategies that identify risk factors, enhance early detection, and support management programs will be developed. DOI and USDA will cooperate with the States in surveillance strategies. For areas with known CWD infections, estimates of disease prevalence can be used to judge the effectiveness of management actions and to evaluate disease dynamics in the context of ecological research questions. Surveillance activities are also needed to satisfy public and management information needs. The number of samples needed for such monitoring is estimated at 150,000 per year.
- Action Item 2: – Epidemiology: Actions involving epidemiological investigations will include identification of high risk and exposed animals, recording and mapping of premise locations, and development of herd plans for source or trace herds. Epidemiological investigations of free-ranging cervids that may pose a risk to farmed animals or may have been infected by exposure to infected farmed elk will also be developed by States in their management/action plans.

Appendix I State Regulations and Activities

In nine States, the State's Department of Agriculture (DOA), or equivalent, has jurisdiction over captive cervids. The Department of Fish and Game, or equivalent, has jurisdiction in seven States. Captive cervid farms are jointly managed by both agencies in 26 States. Regulations in addition to the standard regulations are in place in 49 States. These range from additional testing requirements to banning all cervid importations. Standard regulations include: 1) Certification of Veterinarian Inspection (CVI) (health certificate); 2) import permit; and 3) negative brucellosis and tuberculosis (TB) test (within 30-60 days of import). Twenty-nine States prohibit the importation of cervids from any county, region and/or State that is endemic for CWD; have regulations that can prohibit importation from endemic areas; require that the State exporting the cervid be enrolled in an official CWD monitoring and certification program; and/or require only that there has been no diagnosis of CWD in the originating herd or imported cervid. Seventeen States have banned all cervid imports. Twenty-eight States are currently in the process of developing new and/or additional CWD regulations. Twenty-three States perform captive cervid testing for CWD; 12 additional States are in the process of developing surveillance. Thirty-seven States perform CWD testing on free-ranging cervids; six additional States are in the process of developing surveillance.

Alabama	Department of Conservation and Natural Resources has jurisdiction. No cervid imports are allowed (imports have not been allowed for more than 30 years). The State performs testing on cervid deaths. In 2001, the State implemented hunter-harvested surveillance, and tested a random sample of more than 90 deer. The State plans to increase surveillance for the 2002 hunting season.
Alaska	Division of Agriculture is responsible for game farm permits and inspecting fencing. Division of Environmental Health is responsible for animal health regulations. On May 23, 2002, the State issued a moratorium on cervid importation for six months. Previous regulations required elk to have a special permit. The only captive cervids legally allowed are elk and reindeer. The State is drafting new regulations which will require captive cervids to be enrolled in a CWD monitoring program for a minimum of three years before importation. Recommendations have been made to test captive cervids.
Arizona	Game and Fish Department has jurisdiction. On May 18, 2002, the State issued an emergency statewide ban on the importation of all captive cervids. No cervid listed as restricted live wildlife under R12-4-406 shall be imported into Arizona. The emergency importation ban applies to cervids of the genus *Alces*, common name: moose; cervids of the genus *Odocoileus*, common name: white-tailed and mule deer; and cervids of the genus *Cervus*, common name: red deer and wapiti (elk), except that the species *Cervus nippon*, Nippon deer, is not restricted. Previous regulations required that imported cervids have individual ear tag identification numbers. Emergency and Regular rulemaking are currently underway to permanently ban cervid importation (Note: also being explored is a total ban on cervid possession by private game farms along with additions to the restricted live wildlife list to ban additional species of cervids). The anticipated effective date for emergency rulemaking is June 30, 2002; the anticipated effective date for the regular rulemaking is December 2002. Under the proposed emergency and regular rulemaking, the holder of a private game farm or zoo license will be required to submit the heads of all cervids that die on the licensee's property or in the licensee's control for CWD testing (Note: heads must be submitted within 72 hours of the time of death to the University of Arizona Veterinary Diagnostic Laboratory for analysis for CWD). The State has a CWD testing program for wildlife.
Arkansas	Fish and Game regulates imports relating to wildlife, Livestock and Poultry Commission regulates imports relating to livestock. The State is working on Memorandum of Agreement between the two agencies to delegate final permitting authority to Fish and Game. On May 16, 2002, the State enacted an emergency moratorium on the importation of cervids until further notice. The State is in the process of establishing a task force to identify protocols for CWD prevention and testing. A CWD testing program for wildlife will be implemented in the fall of 2002. Protocols have yet to be determined.
California	Department of Fish and Game (DFG) has authority over all captive cervids and issues the permits required for possession. Department of Food and Agriculture (DFA) becomes the lead over captive cervids only if a disease outbreak occurs which could impact livestock (TB and brucellosis). Fallow deer are permitted under a fallow deer farming permit and various exotic cervids are allowed under an exhibitors permit issue by DFG; no elk are permitted for importation and elk farms are prohibited; importers must have a completed Cervidae Importation Application approved by Wildlife Investigations Laboratory. No cervids are allowed for import that originate from CWD positive States, or have a history of contact with captive elk, or any other potential risk. No new regulations with regard to CWD are being discussed. CWD is listed by DFA as a reportable disease. The State is in the process of developing a slaughter

	surveillance program for farmed fallow deer. The State developed surveillance in 1999 for hunter killed, road kill and dead, and free-ranging mule deer; 432 samples were collected. The State plans to sample at least 300 each year. Michigan cervids require specific pre-entry requirements
Colorado	Division of Wildlife (DOW) regulates wildlife imports and has authority over commercially raised mule deer and other commercially raised wildlife species. DOW is the lead agency. DOA has authority over disease management and importation of alternative livestock (fallow deer and elk). Authority over possession of alternative livestock is shared. All cervids must be free of infectious and contagious disease; must be treated for internal/external parasites within 21 days prior to entry, must be marked with USDA official ear tag, and originate from a bovine TB-free accredited herd. All elk must test negative for evidence of red deer hybridization. Enrollment in 60-month surveillance program is required for importation and intrastate movement of captive cervids. The State bans movement of captive cervids out of endemic areas or off of quarantine facilities located outside of endemic areas. Captive cervid permit holders are given training in CWD specimen collection; mandatory surveillance is done on any elk death whether natural death, slaughter, or hunt park kill. CWD must be reported within 24 hours of diagnosis to DOW Veterinarian. Heads of deer and elk are collected from hunters in certain Game Management Units; more than 1,700 have been tested statewide and more than 10,000 have been tested from endemic areas. The State has culled and tested more than 200 wild deer.
Connecticut	Department of Environmental Protection and DOA have jurisdiction. No cervid imports are allowed. (Previously, no deer or elk were allowed; other cervids required a negative anaplasmosis/ blue tongue test). The State is working on more precise regulations.
Delaware	DOA has jurisdiction. Delaware only has two captive cervid facilities, one red deer, and one sika deer farm. No cervids may be imported from any State in which CWD has been diagnosed. The State is in the early stages of discussing new regulations regarding CWD and testing programs for captive cervids and wildlife.
Florida	Fish and Wildlife Conservation Commission regulates possession of captive cervids DOA oversees importation and health requirements. No cervids may be imported from States diagnosed with CWD (this prohibition will expire at end of June, 2002).
Georgia	DOA has authority over deer farms; Department of Natural Resources (DNR) approves deer farm facilities and oversees wildlife exhibitors and wild animal license holders. No white-tailed deer imports are allowed. State DOA, DNR and Southeast Cooperative Wildlife Disease Study met on May 29, 2002 and agreed that borders need to be closed to cervid importation. DOA will pass legislation prohibiting the importation of farmed deer; DNR will recommend prohibiting the importation of cervids for wild animal businesses. The State has a CWD testing program for wildlife.
Hawaii	DOA has authority over import, possession, and transfer of all cervids. Department of Land and Natural Resources, Division of Forestry and Wildlife regulates the possession of introduced Axis and Black-tailed deer on State lands. A special permit is required for elk and bison and axis deer for commercial use. Black-tailed deer and mule deer are permitted for research and exhibition by special permit. White-tailed deer are not allowed. The State has no specific CWD regulations. Entry permits are issued on case by case basis. The State most likely will not issue entry permits for elk or deer unless they originated from a herd that has been CWD monitored for at least five years. Forestry and Wildlife will request that the State DOA revise permit conditions to require CWD testing before import and to ban import from infected areas. The State has no testing program for captive cervids but has requested a review of sources of imported animals to determine if they originated from CWD source areas. The State has no CWD testing program for wildlife.
Idaho	DOA/Animal Industries has jurisdiction over domestic cervidae, which includes elk, fallow deer, and reindeer. Idaho Department of Fish and Game has jurisdiction over importation and possession of all other species of wildlife. The State requires a negative TB test within 30 days prior to importation; herds must be CWD certified for three years in State of origin; elk must test negative for red deer genetic factor; cervids must originate from region not known to be endemic with *Parelaphostrongylus tenuis* (meningeal worm); the State will not import east of 100 meridian; a valid health certificate from State of origin and an individual identification number are also required. No domestic cervids are allowed from areas where CWD is endemic. No wild cervids are allowed without CWD information from originating State herds. DOA is currently reviewing their Domestic Cervidae rules. The Department of Fish and Game has no plans to change or review their CWD monitoring. CWD monitoring has been done on all domestic elk herds through DOA. Agriculture has a CWD certification program. More than 300 samples have been taken from Hunter Kills and Road Kills since 1997.
Illinois	DOA processes and administers import applications and oversees a captive cervid CWD monitoring program. DNR administers the Captive Game Breeder licensing program. Both have authority over importation and possession. The following regulations were superceded by adoption of the emergency rule, but will likely be back in place upon enactment of a permanent rule following the emergency period: Individual identification number; if originating in a State with vesicular stomatitis, CVI must state that the disease has not been diagnosed on premises of origin within past 30 days and no signs of disease are evident on premises; may not originate from herd under quarantine for any contagious, infectious, or communicable disease. On April 19, 2002, the State implemented

	an emergency rule (in effect for 150-day period) that prohibits importation of all captive cervids; requires that all cervids changing ownership or moving within State must obtain permit from DOA prior to movement; and originate from a herd that is enrolled in a State CWD monitoring program. Any cervid dying from an unknown cause that has exhibited neurological disorder must be tested for CWD; any cervid exhibiting symptoms of CWD will be destroyed and tested or quarantined until it can be determined that the animal does not have CWD. Two 'voluntary' CWD herd-monitoring programs have been established ("Certified Monitored" vs. "Contained Monitored"); intrastate movement or sales of cervids will be contingent upon participation in one of the programs. The State has conducted Targeted Surveillance of suspect animals since 1998, with no positive results; a systematic sample (n=260) of hunter harvested deer from throughout the State was tested during the 2001 season. Additional samples will be taken from northern Illinois (near Wisconsin border) prior to 2002 hunting season, with continued sampling from check stations during the firearm season. Under currently existing emergency regulations, importation is not allowed from any location. Upon adoption of a permanent rule in fall 2002, it is anticipated that importation will be prohibited from a "CWD endemic area," defined as any county or contiguous county where CWD has been diagnosed in the past five years.
Indiana	Department of Natural Resources and DOA - State Board of Animal Health have jurisdiction. An Emergency Rule by the Indiana State Board of Animal Health was enacted on April 16, 2002 which banned all cervid imports into Indiana. In June, the Board will vote on a permanent version of emergency rule which will suspend all cervid imports until May 2003. (Regulations prior to emergency rule: Entry permits issued on case by case basis for deer and elk after reviewing full medical history and herd's CWD monitoring program; permanent identification number). Upon death of any animal, the State veterinarian shall be notified and may inspect the carcass and take any tissues or other necessary testing materials. The State plans to launch CWD surveillance program in 2002.
Iowa	DNR controls captive white-tailed deer, DOA controls elk and other cervids (fallow, sitka, red deer, etc.). A permanent identification number is required. An order was issued modifying Importation Requirements of Cervidae on December 12, 2001: No cervid originating from or having been located in area endemic for CWD is allowed, no cervid from herd having animal introductions from area considered endemic to CWD during last five years, all require entry permit. CVI must state no diagnosis, signs, or epidemiological evidence of CWD in originating herd for the year previous to import. All cervids in originating herd must have been there for at least one year or have been natural additions, herd must have no evidence or diagnosis of CWD or cervid must originate from certified or monitored CWD herd. The State has proposed a four-month moratorium on deer imports unless from herd certified free of CWD. The State is in process of implementing a mandatory monitoring program for captive white-tailed deer; voluntary surveillance for elk and other cervids under the DOA. The State is also compiling a GIS database with captive cervid facilities, and will determine if any cervids on farm were exposed to CWD before importation, may test wild deer from around these facilities. The State is collecting samples from road killed deer, and plans to test 1,000 deer from 2002 hunting season. Captive cervids native to or originating from any county or region under quarantine for bovine TB is not eligible for import.
Kansas	All members of the cervidae family are prohibited entry into Kansas, unless said members are part of a State sponsored certification program that monitors for CWD, including a test of all slaughtered animals of animals that have died because of any other means over 16 months of age. Any import must originate from a herd that has been monitored for CWD for a minimum of four years and has been assigned to the entry level or higher of the State of origin's CWD Certification program. No member of the cervidae family will be allowed entry into Kansas if said animal has originated from a herd that has been declared infected with CWD within the previous five years. The State has a CWD testing program for wildlife.
Kentucky	Department of Fisheries and Wildlife regulated importation and holding of cervids. The DOA is in charge of the health aspect of importing captive cervids and intrastate movement. Cervids cannot originate from a State with vesicular stomatitis. The moratorium on captive cervid importations that was in place from August 2001 to June 2002 has been lifted. On June 1, 2002, the Department of Fisheries and Wildlife and DOA filed emergency regulations with the following requirements: Imported animals must come from facilities that have adopted the Model Protocol for CWD Surveillance and be at a three-year monitored status, or from a facility that has had no importation for three years. There can be no importation from facilities located in States that have had a positive case of CWD in the wild. There can be no importation from facilities located in States that have had a captive case of CWD in the previous five years. Efforts are made to necropsy any elk that dies in Kentucky.
Louisiana	Department of Agriculture and Forestry has jurisdiction. On May 6, 2002, the Wildlife and Fisheries Commission issued a Declaration of Emergency which banned the importation of deer and elk into the State; it also restricted movements within the State. The State developed regulations requiring any permitted game farm to submit samples from any animal that dies for any reason. The State developed surveillance for hunter killed deer for the 2002 hunting season.
Maine	DOA regulates cervids used for meat production; Department of Inland Fisheries and Wildlife regulates all other imports. On June 12, 2002, the State issued a six-month embargo on the importation of deer and elk. The State is in the process of developing long-term regulations, contingency plan, and wildlife

	surveillance. The State has a surveillance program for captive cervids.
Maryland	DNR and DOA have jurisdiction. No imports are allowed (with exceptions). The State prohibits cervid farming for meat or hide, and is in the process of clarifying regulations to prohibit hunting preserves. The State has no specific CWD regulations but is un the process of developing them. The State conducts no testing but will discuss testing as regulations are developed.
Massachusetts	Division of Fisheries and Wildlife regulates importation and possession, the Fish and Wildlife Board creates and modifies regulations and policies regarding captive cervid imports. In April 2002, the State issued a Moratorium on the importation of all cervids. Previous regulations: No white-tailed deer or elk imports allowed, only farmed deer allowed are fallow, sika, reindeer and red deer; bluetongue testing (within 30 days of import) if from endemic area. The State has no active testing program for captive cervids or wildlife.
Michigan	DOA has jurisdiction. On April 26, 2002, the State issues a one-year ban on all deer and elk imports. Previous regulations: USDA alpha numeric ear tag, must originate from bovine TB accredited, qualified or monitored herd, more extensive TB testing required. The State has voluntary surveillance; all death losses in captive herds must be reported to DOA and submitted for CWD testing. The State has tested 452 hunter-harvested white-tailed deer since 1998.
Minnesota	Effective through June 1, 2003, importation of cervids from CWD infected herds, or CWD endemic areas as defined by the State Board of Animal Health are prohibited. Cervids from other areas may be imported only if they have been in a herd that has been subject to State or provincial approved CWD monitoring for at least three years. Animals from herds or areas diagnosed with CWD not allowed. Elk only-herd of origin must be in a State recognized CWD surveillance program for one-year minimum. The State is in the process of developing an emergency outbreak plan. The State has voluntary testing; 167 game farms are enrolled. The Department of Natural Resources has increased CWD targeted surveillance efforts, and released guidelines to field staff for collecting suspect deer. Developing plans for sampling hunter-harvested deer this fall; the State expects to collect and test up to 4,000 deer this year.
Mississippi	Wildlife, Fisheries and Parks has jurisdiction over white-tailed deer; DOA has jurisdiction over exotics. No importation of white-tailed deer is allowed; permanent identification number is required. Wildlife, Fisheries and Parks and DOA met on June 3, 2002 and implemented a ban on the importation of all cervids for 120 days. No imports are allowed from geographic regions where CWD is endemic or diagnosed. Exporting herd must have participated in CWD monitoring program approved by Mississippi State veterinarian for at least 12 months or furnish documentation of the import cervid since birth. The State is in the process of increasing CWD regulations. The State has very few captive cervid facilities. Annual health checks are performed on wild cervids, there is minimal CWD testing.
Missouri	DOA regulates animal health and movement, exhibition, sales and elk for consumption or husbandry. Department of Conservation regulates hunting preserves and breeding facilities. On May 16, 2002, the State issued an Emergency Rule which effected a four-month moratorium on the importation of mule deer, white-tailed deer and elk over 16 months of age; transport of any live wild deer within the State has been halted. (Previous regulations: entry permit required). No cervids from endemic areas, or animals having been in an endemic area during last five years are allowed; if importing from a State with CWD but not an endemic area, herd of origin must be under surveillance for at least three years. The State is working to finalize a State CWD contingency plan. Voluntary CWD surveillance programs have been developed with a majority of enrollment scheduled to begin July 2002. Random testing was done during 2001 hunting season; a comprehensive program will be implemented during fall 2002.
Montana	Fish, Wildlife and Parks has jurisdiction and over licensing, reports, record keeping and exterior fencing, classification, unlawful capture, inspection and enforcement. Department of Livestock has authority over marking, inspection, transport, importation, quarantine, hold orders, interior facilities, health, and enforcement. Cervids must be imported to a game farm with an approved quarantine facility; official identification tag, trace back capabilities; no red, axis, rusa, sambar, sika or roe deer imports; white-tailed deer must originate west of the 100th meridian and be certified free of meningeal worm parasites and dorsal spine larvae; elk must be free of red deer genes; cervidae must be TB and Para TB free. The State is not licensing new captive facilities, no shooting of captive animals or transfer of existing licenses is allowed. Cervids must originate from a herd that has participated in an approved mandatory surveillance CWD program for at least 60 months prior to import; no cervidae have been added to exporting herd within last 60 months from a herd of lesser CWD status; if exporting State has any confirmed CWD, must have completed an epidemiological investigation and identified all CWD affected, exposed, or trace herds. Game Farm Regulation 32.4.1301, Sub-Chapter 13: Requires annual whole herd inspection, identification verification and inventory, must report all animal deaths within one working day of discovery and request inspection with CWD samples submitted for testing; test eligible age is 16 months and older. The State has tested almost 1,800 animals. The State has done statewide sampling since 1998, and has tested more than 1,300 animals. The State also tests deer or elk displaying clinical symptoms.

Nebraska	DOA has jurisdiction. Transport prohibited if exposed, infected, or suspected to have an infectious, contagious, or transmissible disease; identification number required; cannot be moved through more than one concentration point in 90 days. Cervids cannot be moved out of endemic counties into non-endemic counties or out of State. CVI for elk or mule deer must verify: 1) the herd of origin has had no diagnosis or epidemiological evidence of CWD for the past five years; or 2) The herd has been enrolled five or more years in a State-approved CWD herd monitoring program and current status has been recorded on CVI. All captive cervids 16 months or older that die from illness, slaughter, hunting or any other cause shall be reported within 24 hours and submitted for CWD testing. Since 1997, the State has checked 2,491 hunter harvested deer and 131 hunter harvested elk. The State has tested 406 agency harvested deer and 42 animals exhibiting clinical signs. The State will collect statistically valid sample around any positive cervid facility. The State is in the process of developing region wide plans for deer and elk to address a reduction of CWD occurrence. Cervid import from any county or contiguous county that has a positive wild CWD case or from any game farm that has had a positive, exposed or trace animal in the past five years is not allowed.
Nevada	Only elk from a CWD monitored herd with no incidence of the disease in the past five years will be allowed import permits. No elk ranches exist in the State. 328 hunter harvested deer and elk have been tested the past two years. If the State is under quarantine, special provisions apply.
New Hampshire	Departments of Fish and Game and DOA have jurisdiction. On April 30, 2002, the State enacted an Emergency Rule which banned all cervid imports for 180 days. (Previous regulations: No cervidae shall enter the State from any premise where CWD was diagnosed or which has been received from a premise where CWD was diagnosed; permanent identification number). Department of Fish and Game and DOA will meet to discuss permanent regulations. The State has no CWD testing program for captive cervids or wildlife. The State is working with Northeast Deer Technical Committee to establish testing in white-tailed deer.
New Jersey	On April 15, 2002, the State banned all imports and exports of any member of the cervid family. USDA/APHIS/VS, New Jersey DOA will repeat the 1997-98 CWD survey including captive cervids. The State is developing surveillance for captive cervids. In 1997-98, the State conducted a survey using heads from 506 hunter-killed and road-killed deer.
New Mexico	Department of Fish and Game has jurisdiction. Cervids must be permanently and uniquely tattooed in at least one ear and tagged with a USDA metal ear tag; test negative for Johne's disease, and originate from monitored herd free of CWD for at least 60 months. Must have completed "Free of CWD Declaration" stating that cervid does not originate from a herd in which CWD has been diagnosed in the last 60 months, does not originate from a herd identified as a source herd for CWD, and the animal has no history or evidence of ever having been exposed to CWD. Importing party must also sign document stating that farm is disease free. The State has tested captive herd for two years, and performs testing on suspect animals. The State has been testing wild cervids for two years and will continue to test hunter killed deer and elk. The State banned importation from all States and Canada.
New York	Department of Environmental Conservation (DEC) regulates importation and possession of live white-tailed deer and issues licenses for possession, Department of Agriculture and Markets regulates importation with regards to disease testing, process health inspection information and represents "Deer and Elk Farmer" industry. On April 12, 2002, the State banned all imports of any member of the cervid family. (Previous regulations: negative anaplasmosis/blue-tongue test (within 30 days of import) if from State where disease is endemic). DEC, DOA, State Department of Health and USDA, APHIS, Wildlife Services are working on CWD MOU for responding to CWD. DEC is working with the DOA to develop a strategy for CWD testing of captive herds (they expect guidelines within one month from May 28, 2002). The State has a testing program for wildlife.
North Carolina	Locations to and from transport required, identification number required, inventory report required to obtain or renew a captive cervid license. The State has a testing program for wildlife. No cervids are allowed from any county or contiguous county where CWD has been diagnosed.
North Dakota	Board of Animal Health has jurisdiction. Captive cervids must meet standards of risk assessment and/or have health certificate. Elk-must be free of all contagious and infectious disease; genetic testing required in zones 1 and 2 in North Dakota; animal not infected with or exposed to Johne's disease. Importers must complete a CWD Risk Assessment Questionnaire and fax it to the Board of Animal Health prior to entry permit issuance; cervids and originating herds must have no history of emaciation, depression, excessive salivation or thirst, or neurological disease. If symptoms arise, diagnostic measures must be taken to rule out a TSE. Game and Fish Department is in process of developing a Prevention and Contingency Plan for CWD in free-ranging cervids. Board of Animal Health has conducted mandatory surveillance since 1998 and mandatory inventory since 1993 for captive elk, white-tailed deer, and mule deer over 12 months of age that die for any reason. Game and Fish Department has conducted Target Surveillance of free-ranging cervids since 1996. The State is in the process of developing voluntary surveillance program of hunter-killed cervids.

Ohio	DOA has jurisdiction. Cervids entering the State must be free of symptoms of CWD. No importations are allowed from quarantine premises or area. On May 6, 2002, the State banned the importation of all cervids from Wisconsin. If entering cervids tested negative but were exposed to the disease, they might be allowed entry. No importation from quarantine premises or area is allowed. The State is in the process of developing legislation requiring all cervid imports be from CWD accredited herds and implementing an emergency rule on the importation of cervids from areas where CWD has been diagnosed. The State is in the process of developing a monitoring program for captive cervids. The State plans to include CWD in 2002 hunting season deer gun TB survey. No cervid imports from Wisconsin are allowed.
Oklahoma	Department of Wildlife Conservation and DOA have jurisdiction. Cervids must originate from a premises where TB and brucellosis have not been diagnosed in the last 12 months; a permanent identification number is required. On May 21, 2002, the DOA suspended the import of cervids from all States and provinces where CWD has been identified in free-ranging cervid populations. Additionally, all other cervid imports require the source herd to participate in a State and Federal CWD monitoring program as of January 1, 2001. On June 3, 3002, the Department of Wildlife Conservation passed rules which coincide with rules of the DOA. The State has voluntary surveillance in participating herds requires testing all captive cervids over 16 months of age that die, perimeter fencing prevent ingress/egress of cervids, annual herd inventory by an accredited veterinarian, designation of herd status, herd additions allowed from herd of equal or greater status, each animal shall have a minimum of two approved unique identifiers. 393 hunter-harvested animals have been tested since 1999, including 376 white-tailed deer, 8 mule deer and 9 elk.
Oregon	The State requires detailed herd history and elk negative for red-deer hybridization will only import fallow deer, reindeer and elk. The State prohibits importation if animal has ever been in or is from Manitoba or any Canadian province east of Manitoba, Minnesota, Iowa, Missouri, Oklahoma, or Texas.
Pennsylvania	Game Commission and DOA have jurisdiction. Cervids are exempt if moved to hunting preserve for purpose of being shot; an identification number is required. Agricultural Code (3 Pa.CSA 2322d, effective January 5, 2002 - January 4, 2003): Cervids must originate from a State where CWD is not known to exist, and the animal may not originate or have resided at anytime in a State in which CWD is known to exist. Cervid must be from a farm/herd enrolled in a State approved CWD monitoring program for at least five years. The State tests all captive cervids over 16 months that die (including slaughter), require perimeter fencing preventing ingress/egress of cervids, annual herd inventory, designation of herd status, must report herd additions. The State has a testing program for wildlife.
Rhode Island	Cervids must originate from a Federally accredited TB free herd; negative anaplasmosis/blue-tongue test (within 30 days of import). The State requires proof that there is no current or past history of contact with or exposure to any potential CWD animals or States affected by CWD. The State plans to incorporate CWD permanently into regulations as soon as possible.
South Carolina	DNR has ultimate control over importation and possession of captive cervids. Clemson University Livestock and Poultry Health also provides permit if and only if the Department of Natural Resources has previously permitted importation of the cervid. Other than an occasional permit for temporary exhibition (like reindeer at Christmas shows) and one dated permit for a small number of privately held fallow deer, importation of cervids has not been permitted (SC Code Section 50-11-1920). As of May 2002, no more permits for temporary exhibition. Since 1998, the State has participated in CWD surveillance with Southeast Cooperative Wildlife Disease Study.
South Dakota	DOA has jurisdiction. Negative anaplasmosis/blue-tongue test (within 30 days of import) and individual identification number are required. Owners must complete Elk Herd Demographics and Risk Assessment form. Cervids must originate from a herd in which all cervidae have been kept for at least one year or into which they were born. No exposure to or additions from any other source in the past year are allowed. No diagnosis, signs or epidemiological evidence of CWD in this herd for the past year are allowed. Movement will be allowed if animals originate from a herd determined to have a certified CWD cervid herd status by the Animal Health Official of South Dakota. Documentation must also state that no animal in the herd has originated from, or ever been a member of, a herd where CWD has been diagnosed, or have been a member of a CWD trace-back or trace-forward herd by an epidemiological investigation in the past five years. No new regulations are being discussed. The State monitors the occurrence and distribution of CWD; captive cervid farms are required to keep inventory and report any additions, disappearances or illnesses which may be submitted for diagnosis. The State tested 881 hunter harvested animals (368 elk, 251 white-tailed deer, 101 mule deer) in 1998-99, emphasis for testing is on elk and deer near quarantined herds, Department of Fish and Game will take unhealthy animals for evaluation.

Tennessee	DOA has jurisdiction. No cervids are allowed from geographic areas where CWD diagnosed; CVI must state importing cervid originates from herd in CWD surveillance program for at least 18 months. On May 3, 2002, DOA enacted an Emergency Rule which banned the importation of cervids from geographic areas where CWD diagnosed; risk assessment based on proximity of cervid to positive CWD geographic areas is required; CVI must state importing cervid originates from herd in CWD surveillance program for at least 18 months, herd diagnosed with CWD, nor identified as a CWD trace-back or trace-forward herd, any additions to herd must originate from a herd that has participated in a CWD surveillance program for at least 18 months. Surveillance on captive cervids is performed on a voluntary basis. Testing is done on animals displaying symptoms of CWD. The State plans to increase surveillance in 2002 to include testing of wild deer near captive cervid facilities.
Texas	Animal Health Commission and Wildlife Commission have jurisdiction. On March 20, 2002, the Texas Animal Health Commission and Texas Parks and Wildlife Commission issued separate orders to prohibit the entry of all elk, white-tailed deer, black-tailed deer and mule deer into Texas. The State has had voluntary surveillance since 1999; in participating herds, it requires submission of samples from all cases of mortality in animals over 16 months of age.
Utah	CVI must state that cervid is not infected with Johne's, CWD, or malignant catarrhal fever and may have never been east of the 100 degree meridian. Animals must have all internal and external parasites treated. Cervids must originate from a State or province that requires all suspected/confirmed cases of CWD to be reported, State must have the authority to quarantine. Elk must originate from States with implemented programs for surveillance, controls and eradication of CWD in domestic elk. No elk from herd, trace-back herd or adjacent herd diagnosed with CWD or elk exposed to or positive for CWD allowed for import. The State has mandatory cervid farm testing, must report any suspect or finding of CWD and must submit any elk over 16 months of age that dies for any reason for testing, captive hunting facilities must submit samples from 50percent of all elk that are killed, slaughtered or destroyed. The State began wildlife surveillance in 1998, tested 761 deer and elk 1998-1999, and now has program targeting deer and elk exhibiting symptoms of CWD.
Vermont	DOA and Fisheries and Wildlife Department have jurisdiction. In May 2002, DOA and Fish and Wildlife Department issued a moratorium on the importation of cervids (this will be reviewed in six months). (Previous regulations: Animals must also test negative for anaplasmosis/blue tongue and vesicular stomatitis exposure. Reindeer and red deer must be free of nematodes of subfamily *Elaphostranigylinaee* at the time of importation).
Virginia	Department of Fish and Game has jurisdiction. No white-tailed deer farming is allowed; two to three fallow deer farms exist; no other cervids are allowed. The State is in the process of implementing a ban on all cervids and of developing mandatory surveillance. The State tested wild elk from 2001 hunting season, and is in the process of making elk testing mandatory.
Washington	The State requires a permanent identification number, origin of shipment, *Elaphostrongylinae* test (meningeal and muscle worm). No deer or elk may be imported, only fallow deer and reindeer. Veterinarian must report any signs of CWD by the next working day; farm owners must do monthly reporting when required by veterinarian. The State has conducted target surveillance sampling since 1995 from wild cervids with CWD symptoms, and will substantially increase surveillance for 2002 hunting season. In 2001, expanded surveillance is to include locker room checks of meat processors handling wild game.
West Virginia	DNR and DOA jointly issue import permits. Cervids must originate from TB Accredited herd; must complete application for importation; may not originate from any State diagnosed with CWD or TB. No cervids from States with CWD are allowed. The State has a CWD testing program for wildlife.
Wisconsin	Department of Agriculture, Trade and Consumer Protection regulates the importation of all cervids and registers farmed non-native cervids. DNR licenses white-tailed deer farms. The State has an embargo on cervids from any State where CWD has been found, no imports of elk or deer are allowed unless they come from herds that have been monitored and free of CWD for at least five years. The State is gathering comments on the draft of a permanent rule to tighten restrictions of import and intrastate movements of deer or elk and to require farmed raised deer and elk to be tested when they die or go to slaughter. Rule public hearings are scheduled for June 2002. The State has mandatory enrollment of all herds shipping live animals requires official identification, inventory, reporting of transactions, sampling of all mortalities of animals 16 months or older. The State has mandatory testing on all other carcasses of cervids 16 months and older if any part of the carcass leaves the farm. The State has tested more than 1,000 wild deer since 1999, and plans to expand voluntary testing of hunter harvested animals. The State will cull all deer in the eradication zone and reduce the deer population in adjacent management units to 50 percent of over-winter goals.
Wyoming	Game and Fish Commission has jurisdiction. Cervid ranching is not allowed; one elk ranch (which is not in the CWD endemic area and has opted not to import any cervids) was given an exemption. The State conducts continual statewide targeted animal survey; annual hunter surveys in endemic area, and tests more than 1,000 animals per year.

Appendix II List of Working Group Members

Task Force Members

Bobby Acord	U.S. Department of Agriculture (task force co-chair)
Steven A. Williams	U.S. Fish and Wildlife Service (task force co-chair)
A. Gordon Brown	U.S. Department of the Interior
Larry Bryant	U.S. Department of Agriculture
Bill Clay	U.S. Department of Agriculture
John R. Clifford	U.S. Department of Agriculture
W. Ron DeHaven	U.S. Department of Agriculture
Dennis B. Fenn	U.S. Geological Survey
John Fischer	Southeastern Cooperative Wildlife Disease Study
Gary Rankle	Bureau of Indian Affairs
Michael Gilsdorf (for John Clifford)	U.S. Department of Agriculture
Randy Jones	National Park Service
Bruce Morrison	Nebraska Game and Parks Commission
Frank Quimby	U.S. Department of the Interior
Caird E. Rexroad, Jr.	U.S. Department of Agriculture
Casey Stemler	U.S. Fish and Wildlife Service
Gary Taylor	International Association of Fish and Wildlife Agencies

CWD Task Force Working Groups

Research

Dennis B. Fenn, Co-Chair	U.S. Geological Survey
Caird E. Rexroad, Jr., Co-Chair	U.S. Department of Agriculture
Elizabeth Williams, State Co-Chair	University of Wyoming
Jerald Bartelt	Wisconsin State Department of Natural Resources
Chris Brand	U.S. Geological Survey
Lynn Creekmore	U.S. Department of Agriculture
Dick Curnow	U.S. Department of Agriculture
Linda Detwiler	U.S. Department of Agriculture
John Fischer	Southeastern Cooperative Wildlife Disease Study
Michael Gilsdorf	U.S. Department of Agriculture
Susan Haseltine	U.S. Geological Survey
Robert Heckert	U.S. Department of Agriculture
David Morris	U.S. Department of Agriculture
Joseph Spence	U.S. Department of Agriculture
Margaret Wild	National Park Service
Larry Williams	Nebraska Department of Agriculture

Surveillance

Michael Gilsdorf, Co-Chair	U.S. Department of Agriculture
James Nichols, Co-Chair	U.S. Geological Survey
Bruce Morrison, State Co-Chair	Nebraska Game and Parks Commission
Vicki Bridges	U.S. Department of Agriculture
Kenneth Burnham	U.S. Geological Survey
Wayne Cunningham	Colorado Department of Agriculture
Jim de Vos	Arizona Game and Fish Department
Tomas Gomez	U.S. Department of Agriculture
Adam Grow	U.S. Department of Agriculture
David L. Otis	Iowa State University
Michael Samuel	U.S. Geological Survey

Communications

Bill Clay, Co-Chair	U.S. Department of Agriculture
Frank Quimby, Co-Chair	U.S. Department of the Interior
Dale Garner, State Co-Chair	Iowa Department of Natural Resources
Anna Cherry	U.S. Department of Agriculture
Eugene J. Kinerney (Butch)	U.S. Geological Survey
David Morris	U.S. Department of Agriculture
Hallie Pickhardt	U.S. Department of Agriculture
Paul Slota	U.S. Geological Survey
Kim Smith	U.S. Department of Agriculture
Heidi Valetkenitch	U.S. Department of Agriculture
Jeff Ver Steeg	Colorado Division of Wildlife

Information

Bill Clay, Co-Chair	U.S. Department of Agriculture
Gladys Cotter, Co-Chair	U.S. Geological Survey
Steve Schmitt, State Co-Chair	Michigan Department of Natural Resources
F. Joshua Dein	U.S. Geological Survey
Jacob Faibisch	International Association of Fish and Wildlife Agencies
Jean Fierke	Michigan Department of Natural Resources
John Mosesso	U.S. Geological Survey
Vivian Nolan	U.S. Geological Survey
Todd Peterson	Wisconsin Department of Natural Resources
Paul Slota	U.S. Geological Survey
Ollie Torgerson	Missouri Department of Conservation

Diagnostics

Randall Levings, Co-Chair	U.S. Department of Agriculture
Scott Wright, Co-Chair	U.S. Geological Survey
John Fischer, State Co-Chair	Southeastern Cooperative Wildlife Disease Study
Phil Bochsler	Wisconsin Veterinary Diagnostic Laboratory
Nancy Clough	U.S. Department of Agriculture
Al Jenny	U.S. Department of Agriculture
Katherine O'Rourke	U.S. Department of Agriculture
Clarence Siroky	Wisconsin Department of Agriculture
Terry Spaker	Colorado State University
Elizabeth Williams	University of Wyoming

Disease Management

Lynn Creekmore, Co-Chair	U.S. Department of Agriculture
Margaret Wild, Co-Chair	National Park Service
Bruce Morrison, State Co-Chair	Nebraska Game and Parks Commission
Ginger Akin	U.S. Department of Agriculture
John Damaré	U.S. Department of Agriculture
Michael Gilsdorf	U.S. Department of Agriculture
Tom Hauge	Wisconsin Department of Natural Resources
Jim Logan	Wyoming State Department of Agriculture
Mike Miller	Colorado Division of Wildlife
Jack Ryhan	U.S. Department of Agriculture
Rob W. Werge	U.S. Department of Agriculture
Scott Wright	U.S. Geological Survey

DNR Commercial Sale
of
Wildlife

58CSR63

DIVISION OF NATURAL RESOURCES
Wildlife Resources Section
Capitol Complex, Building 3, Room 812
1900 Kanawha Boulevard, East
Charleston WV 25305-0664
Telephone (304) 558-2771
Fax (304) 558-3147
TDD 1-800-354-6087

Bob Wise
Governor

Ed Hamrick
Director

September 25, 2002

The Honorable Joe Manchin, III
West Virginia Secretary of State
The State Capitol, Suite 157 K
1900 Kanawha Boulevard, East
Charleston, West Virginia 25305-0770

Dear Mr. Manchin:

Attached, please find documentation associated with an emergency rule that I have approved which would specifically prohibit the importation of cervids, including deer and elk, into the State of West Virginia. This emergency rule has been prepared to address the emerging and ongoing risks associated with chronic wasting disease infection to the state's white-tailed deer herd.

Thank you for your attention to the filing of this emergency rule. Should you have any questions or require additional information in this regard, please contact me.

Sincerely,

Ed Hamrick
Director

Attachments

WEST VIRGINIA
SECRETARY OF STATE
JOE MANCHIN, III
ADMINISTRATIVE LAW DIVISION

Form #7

Do Not Mark In This Box
Filing Date

Effective Date

NOTICE OF AN EMERGENCY RULE

AGENCY: BOC - Division of Natural Resources TITLE NUMBER: 58

CITE AUTHORITY: W. Va. Code 20-1-7(30), 20-2-11, 20-2-13

EMERGENCY AMENDMENT TO AN EXISTING RULE: YES X NO ____

IF YES, SERIES NUMBER OF RULE BEING AMENDED: ____

TITLE OF RULE BEING AMENDED: Commercial Sale Of Wildlife

IF NO, SERIES NUMBER OF RULE BEING PROPOSED: ____

TITLE OF RULE BEING PROPOSED: ____

THE ABOVE RULE IS BEING FILED AS AN EMERGENCY RULE TO BECOME EFFECTIVE AFTER APPROVAL BY SECRETARY OF STATE OR 42ND DAY AFTER FILING, WHICHEVER OCCURS FIRST.

THE FACTS AND CIRCUMSTANCES CONSTITUTING THE EMERGENCY ARE AS FOLLOWS:

Use additonal sheets if necessary

Authorized Signature

TITLE 58
LEGISLATIVE RULE
DIVISION OF NATURAL RESOURCES

SERIES 63
COMMERCIAL SALE OF WILDLIFE

CIRCUMSTANCES

The recent discovery of chronic wasting disease (CWD) in deer and elk in new locations in a number of states has led to USDA issuing a declaration of emergency regarding CWD and development of a national management plan. This disease is especially serious in that there is no known test for live animals. Chronic wasting disease is a progressive fatal disease of the nervous system in cervids. Although there has been no known cases in humans, the consumption of deer meat infected with the disease is considered a risk.

The recreational hunting and wildlife viewing associated with the deer herd and associated economic benefits would drastically decrease should CWD become established in the West Virginia deer herd. Millions of dollars have been spent and dedicated to the elimination and control of CWD in states where it has occurred. Prevention of the introduction of CWD into West Virginia is the most economically prudent course of action. Recent surveys of hunters in Wisconsin where the disease occurs indicates that 36% of hunters may not participate in deer hunting this fall because of their concern for CWD. A 36% decline in deer hunting in West Virginia would result in a loss of a minimum of $2.6 million in license sales and a total loss of $89 million from deer hunting to the state's economy.

A primary method of spreading the disease has been through the interstate transfer of deer and elk into captive pens. Immediate action must be taken to change West Virginia's laws to prevent the importation of cervids into the state and decrease the risks associated with CWD and other wildlife associated diseases from becoming established in our native wildlife.

APPENDIX B

FISCAL NOTE FOR PROPOSED RULES

Rule Title: Commercial Sale of Wildlife

Type of Rule: X Legislative _____ Interpretive _____ Procedural

Agency: Division of Natural Resources

Address: Room 812, Building 3, Capitol Complex

Charleston, West Virginia 25305

Telephone Number 304/558-2771

1. Effect of Proposed rule:

	ANNUAL		FISCAL YEAR		
	INCREASE	DECREASE	CURRENT	NEXT	THEREAFTER
ESTIMATED TOTAL COST	0	0	0	0	0
PERSONAL SERVICES					
CURRENT EXPENSE					
REPAIRS & ALTERATIONS					
EQUIPMENT					
OTHER					

2. Explanation of Above Estimates:
Costs to implement this rule are negligible.

3. Objectives of These Rules:
This emergency rule is being filed to stop the importation of cervids into West Virginia to minimize the risk of spreading chronic wasting disease into the native deer herd.

Rule Title: Commercial Sale of Wildlife

4. Explanation of Overall Economic Impact of Proposed Rule:

   A. Economic Impact on State Government:
   Chronic wasting disease could potentially cause sitnificant losses in the $249 million annual economic benefits of deer hunting in West Virginia.

   B. Economic Impact on Political Subdivisions; Specific Industries; Specific Groups of Citizens:
   Chronic wasting disease could significantly decrease the recreational opportunities associated with the deer herd in West Virginia.

   C. Economic Impact on Citizens/Public at Large.
   Loss of revenue associated with deer hunting and viewing could seriously injure small businesses associated with these activities. There would be a minimal increase in operational costs for operators of commercial game farms.

Date: 9/25/02

Signature of Agency Head or Authorized Representative:

EMERGENCY RULE QUESTIONNAIRE

DATE: _____

TO: LEGISLATIVE RULE-MAKING REVIEW COMMITTEE

FROM:(*Agency Name, Address & Phone No.*) Division of Natural Resources
Room 812, Building 3, Capitol Complex
Charleston, West Virginia 25305
Telephone Number 304/558-2771

EMERGENCY RULE TITLE: Commercial Sale of Wildlife

1. Date of filing _____

2. Statutory authority for promulgating emergency rule:

West Virginia Code Chapter 20-1-7(30), 20-2-11, 20-2-13

3. Date of filing of proposed legislative rule: _____

4. Does the emergency rule adopt new language or does it amend or appeal a current legislative rule? _____
Amends 58CSR63

5. Has the same or similar emergency rule previously been filed and expired?

No

6. State, with particularity, those facts and circumstances which make the emergency rule necessary for the **immediate** preservation of public peace, health, safety or welfare.

Chronic Wasting Disease has spread to several states and a Canadian province. There is no known test for live animals. This disease would cause serious biological and economic problems in managing the state's wildlife resources. Transportation of cervids between states is believed to be a primary factor in spreading the disease. A ban on the importation of cervids into West Virginia is necessary to reduce this risk.

7. If the emergency rule was promulgated in order to comply with a time limit established by the Code or federal statute or regulation, cite the Code provision, federal statute or regulation and time limit established therein.

Not Applicable

8. State, with particularity, those facts and circumstances which make the emergency rule necessary to prevent substantial harm to the public interest.

Chronic Wasting Disease presents a serious threat to the state's wildlife resources and there is no live animal test currently available to diagnose this disease. Current West Virginia law does not prevent the importation of cervids into W. Va., a primary means of transmission of this disease. This proposed change would ban the importation of cervids and allow effective monitoring of existing captive cervid herds in the state.

TITLE 58
LEGISLATIVE RULES
BUREAU OF COMMERCE
DIVISION OF NATURAL RESOURCES

SERIES 63
COMMERCIAL SALE OF WILDLIFE

§ 58-63-1. General.

1.1. Scope. -- This legislative rule establishes regulations to govern the sale or transfer of wildlife raised, imported, or captured under licenses issued by the Division pursuant to W. Va. Code §§ 20-2-11, 20-2-13, 20-2-47 ~~and~~ 20-2-48, 20-2-51, and 20-2-52.

1.2. Authority. -- W. Va. Code § 20-2-11, 20-1-7, 20-2-13

1.3. Filing Date. -- ~~May 10, 1996~~.

1.4. Effective Date. -- ~~May 10, 1996~~.

§ 58-63-2. Definitions.

2.1. "Facility" means the property on which a person engages in an activity for which one of the licenses listed in Section 2.2 of this rule or issued pursuant to W. Va, Code 20-2-51 and 20-2-52, is required by statute and includes, but is not limited to, buildings, enclosures, grounds, impoundments, and ponds.

2.2. "Licensee" means a person who has been granted one of the following permits and licenses issued by the Division or issued pursuant to W. Va. Code 20-2-51 and 20-2-52:

2.2.1. A license for the operation of a private game preserve for the propagation of wild animals or wild birds for commercial purposes (W. Va. Code § 20-2-47). The Division will issue three (3) categories of this license:

2.2.1.a. Commercial game farm license. This license authorizes the licensee to breed or raise wild animals and wild birds as specified by the license, to sell the wild animals and wild birds dead or alive, or to sell the eggs of birds in accordance with the provisions of this rule and under the terms and conditions of the license. This license does not include the acquisition or holding of foxes or raccoons trapped from the wild by a legal trapper (W. Va. Code § 20-2-11); and

2.2.1.b. Hound coursing/training pen game farm license. This license authorizes the licensee to purchase, hold, and release into hound coursing/training pens in accordance with the provisions of this rule and under terms and conditions of the license, live foxes or raccoons obtained from the wild by a legal trapper (W. Va. Code § 20-2-11) or live wildlife obtained by means specified under Section 3 of this rule; and

2.2.1.c. Incorporated sportsmen club game farm license. This license authorizes incorporated sportsmen clubs in West Virginia to purchase, hold, and release in accordance with the provisions of this rule and under terms and conditions of the license, live foxes and raccoons obtained from the wild by a legal

trapper (W. Va. Code § 20-2-11) or other means specified under Section 3 of this rule for the purpose of restocking.

2.2.2. A license for the operation of a private plant, pond, or business for the propagation, sale, or purchase of fish, frogs, turtles, or other forms of aquatic life for commercial purposes (W. Va. Code § 20-2-48). This license authorizes the licensee to breed or raise such species as specified by the license and to buy and sell those species dead or alive or the eggs of the species in accordance with the provisions of this rule.

2.3. "Wildlife" means wild animals, wild birds, fish, reptiles, amphibians, mollusks, crustaceans, and all forms of aquatic life used as fish bait, whether dead or alive.

2.4. "Legal Trapper" means a trapper possessing a valid West Virginia trapping license or its equivalent (W. Va. Code §§ 20-2-27 and 20-2-28).

2.5. "Hound Coursing/Training Pen" means a permanent enclosure of no less than forty (40) acres from which there is no reasonable expectation of escape of the animals placed within, except that fox hound coursing/training pens must enclose no less than one hundred (100) acres.

2.6. "Incorporated Sportsmen Club" means a club, organization, or group formed for a common purpose to further the tradition of hunting, fishing, or trapping and registered with the Secretary of State for that purpose.

2.7. "Native" means commonly accepted and documented in scientific literature to live in the wild as part of the present or historic natural fauna of this State.

2.8. "Cervid" means all members of the deer family, native or exotic.

~~2.8.~~2.9. All other terms have the meaning prescribed in W. Va. Code § 20-1-2.

§ 58-63-3. Wildlife Acquisition.

3.1. Wildlife held by a licensee shall have been:

3.1.1. Obtained from a person licensed by the Division to sell wildlife in this State;

3.1.2. Imported into this State under the provisions of W. Va. Code § 20-2-13;

3.1.3. Born at the licensee's facility, the offspring of wildlife legally held by the licensee; or

3.1.4. Obtained from a legal trapper under the provisions of W. Va. Code § 20-2-11 and the animal captured within the county in which the licensee is to hold and release the animal or captured from counties specified by the Director for which inter-county sale or possession transfer may occur under terms and conditions of the license.

3.2. If a licensee acquires wildlife in the manner specified in Section 3.1.1 of this rule, a bill of sale from the supplying vendor must be retained by the licensee as proof of legal acquisition and be carried while transporting the wildlife to and from the facility.

3.3. If a licensee acquires wildlife in the manner specified in Section 3.1.2 of this rule, the importation permit issued by the Division, health certificate from the state of origin, and a bill of sale from the supplying vendor must be retained by the licensee as proof of legal acquisition and be carried while transporting the wildlife to and from the facility.

3.4. If a licensee acquires wildlife in the manner specified in Section 3.1.1, 3.1.2, and 3.1.3 of this rule, a record must be kept by the licensee in accordance with the provisions of Section 5 of this rule.

3.5. If a licensee acquires wildlife in the manner specified in Section 3.1.4 of this rule the foxes and raccoons must be ear tagged by the licensee with a tag supplied by the Division within three (3) days of purchase and before release into the wild or a hound coursing/training pen and a record must be kept by the licensee in accordance with the provisions of Section 5 of this rule.

3.6. If a legal trapper acquires live foxes and raccoons under provisions of W. Va. Code § 20-2-11 for the purpose of sale or any other form of possession transfer, the live foxes and raccoons shall only be possessed by the trapper during the trapping season and sixty (60) days thereafter. Live foxes and raccoons held for thirty (30) days or less shall be held according to temporary or permanent cage/pen/housing requirements as specified under Miscellaneous Permits and Licenses 58 CSR 64 and foxes or raccoons held over thirty (30) days shall be held according to permanent cage/pen/housing requirements as specified under Miscellaneous Permits and Licenses 58 CSR 64.

3.7. If a licensee acquires cervids in a manner specified in this rule after September 1, 2002 the wildlife will be tattooed in the ear and a metal tag affixed with a unique identification number.

§ 58-63-4. Wildlife Sales or Transfer.

4.1. The licensee and legal trapper that sells or transfers possession of wildlife shall provide a bill of sale or document to each person who purchases or receives the wildlife. The bill of sale or document shall be maintained with the wildlife while transporting and shall, at a minimum, contain the following information:

4.1.1. The licensee's or legal trapper's name and address;

4.1.2. The licensee's or legal trapper's license number;

4.1.3. The date of the sale or transfer;

4.1.4. The purchaser's or receiver's name and address; and

4.1.5. A description of the wildlife sold or transferred, including the number of each species sold or transferred and any unique identification.

4.1.5.a. For sales of fish, this description shall include the number of pounds of each species sold.

4.2. Legal trappers which acquire live foxes and raccoons under the provisions of W. Va. Code § 20-2-11 shall only sell or transfer possession of live foxes or raccoons to licensed hound coursing/training pens or incorporated sportsmens clubs located within the county from which the fox or raccoon was captured or located in the counties specified by the Director for which inter-county sale or possession transfer may occur.

4.3. The licensee under the provisions of Section 2.2.1.b. and 2.2.1.c. of this rule shall not transfer possession or resell any foxes or raccoons acquired under Section 3.1.4 of this rule.

4.4. The Director shall in October of each year publish a list of specified counties for which the inter-county sale or possession transfer of live foxes and raccoons obtained under provisions of W. Va. Code § 20-2-11 may occur.

4.5. The Director shall suspend the sale or any other form of relocation of live foxes and raccoons acquired under the provisions of W. Va. Code §20-2-11 in any county or portions thereof to protect public health and the welfare of native wildlife.

4.6. The Director shall prohibit the importation of cervids into West Virginia to protect the public health and the welfare of native wildlife. Provided that, the Division of Natural Resources retains the ability to import all wildlife during the normal course of it's mission.

4.7 The Director shall prohibit the sale and relocation of cervids within West Virginia to protect the health and public welfare of native wildlife.

4.8. The Director may suspend the importation, sale, and relocation of wildlife acquired or held under provisions of the W. Va. Code to protect public health and the welfare of native wildlife.

§ 58-63-5. Record Keeping.

5.1. Accurate and current records of all wildlife acquisitions and sales or possession transfers shall be maintained by the licensee. Records on all wildlife born at the licensee's facility shall also be maintained. Records of all cervids and other wildlife escaping from the facility shall be maintained and escapes shall be reported to district law enforcement captain within 24 hours of discovery. All records shall be either typed or written in plain and legible English and shall include the full name, address, and telephone number of each person with whom the licensee has conducted a wildlife transaction and commercial game farm licensee shall maintain these records on forms supplied by the Director. The records shall contain the ear tag number, county of origin, date, and disposition for all live foxes and raccoons acquired in the manner specified in Section 3.1.4. of this rule. All records shall be maintained by the licensee at his or her facility for a minimum period of three (3) years and a copy of the records of all acquisition, sales, or possession transfers shall be forwarded to the district law enforcement captain within 15 days of the transaction.

§ 58-63-6. Inspections.

6.1. A licensee's facility, records, or wildlife may be inspected by an authorized representative of the director, on a case by case basis, to assure compliance with all requirements mandated by statute or rule or by the terms and conditions of the licensee's permit or license.

6.2. The Director shall require the licensee to submit appropriate samples for testing and/or enroll in federal government national disease prevention programs such as, but not limited to, tuberculosis free certification and chronic wasting disease free certification, as a term and condition of the wildlife acquisition, sale, or possession transfer to protect public health and the welfare of native wildlife.

§ 58-63-7. Possession For Commercial Purposes Prohibited.

7.1. Except persons possessing a license or permit issued for such purpose or specifically designated by authority of W. Va. Code § 20-2-11, it is illegal for any person to take, or attempt to take, from the wild or possess for commercial purposes any species of wildlife native to this State, either dead or alive, or to take or attempt to take by any means, or to sell, trade, barter, expose or offer for sale, trade or barter, or to possess or transport, or to have in one's possession with the intent to transport into or out of the state any native wildlife, their eggs, or part thereof for commercial purposes.

§ 58-63-8. Penalties.

A violation of this rule constitutes a misdemeanor for each offense in accordance with W.Va. Code § 20-2-11 and for each misdemeanor offense a person is subject to the penalties provided for in W. Va. Code § 20-7-9.

Regulations Dealing with the Importation and Intrastate Movement of Cervids in Kentucky, Maryland, Ohio, Pennsylvania and Virginia

November 18, 2002

	Does this state allow for the importation of Cervids?	Does this state allow for the intrastate movement of Cervids?	Other provisions relating to captive Cervids.
KENTUCKY	Effective November 12, 2002, the state implemented a total ban on the importation of all Cervids.	The intrastate movement of Cervids is prohibited, except that individuals currently permitted to hold Cervids may move animals to a slaughter facility licensed by the United States Department of Agriculture or out of state.	No new permits will be issued for the holding of Cervids. No new shooting preserve permits will be issued for any species other than birds.
OHIO	Effective May 6, 2002, the state implemented a total ban on the importation of all Cervids from the State of Wisconsin. The State of Ohio is in the process of developing legislation requiring all Cervid imports be from CWD free accredited herds and implementing an emergency rule prohibiting the importation of Cervids from areas where CWD has been diagnosed.	The intrastate movement of Cervids is allowed; however, animals must meet certain criteria for Bovine Tuberculosis and Brucellosis testing.	
PENNSYLVANIA	Effective August 1, 2002, the state implemented a total ban on the importation of all Cervids.	The intrastate movement of Cervids is allowed; however, animals must meet certain criteria for Bovine Tuberculosis and Brucellosis testing.	
MARYLAND	The importation of most Cervids is currently prohibited, and within 2 ½ weeks the state will implement a total ban on the importation of all Cervids.	The intrastate movement of Cervids is only allowed between captive Cervid facilities with approved exhibitor permits.	Deer farming is prohibited in the state. No new exhibitor permits are being issued.
VIRGINIA	Effective October 2002, the state implemented a total ban on the importation of all Cervids.	The intrastate movement of Cervids is totally prohibited.	The farming of white-tailed deer and elk is prohibited in the state. A small number of fallow deer farms have been "Grand-fathered" and are allowed to continue production of this Cervid species. No other Cervid farming is allowed.

Chronic Wasting Disease
Presented to the Natural Resources Commission
October 27, 2002

This has proven to be a most unusual year for our agency in terms of the multiple wildlife disease issues that have arisen. These include West Nile, Avian Influenza, Epizootic Hemorrhagic Disease and Chronic Wasting Disease. On more than one occasion this year, I have counted my blessing for having Dr. Jim Crum on our staff. Jim has an excellent professional background in the complex and technical area of wildlife diseases, and he has been doing yeomen's work on a variety of issues relating to these matters. I would like to take this opportunity to provide you with an overview of Chronic Wasting Disease, or CWD, and the steps our agency has taken to address this wildlife disease threat.

Chronic Wasting Disease, or CWD, is a neurological disease of deer and elk that produces small lesions in the brains of infected animals. It is characterized by loss of body condition, behavioral abnormalities and death. CWD is classified as a transmissible spongiform encephalopathy (TSE), and is similar to mad cow disease in cattle and scrapie in sheep. The human variety of TSE is called Creutzfeld-Jakob Disease.

Although CWD is a contagious fatal disease among deer and elk, research suggests that humans, cattle and other domestic livestock are resistant to natural transmission. While the possibility of human infection remains a concern, it is important to note that there is no convincing evidence linking CWD to humans.

Infectious agents of CWD are neither bacteria nor viruses, but are hypothesized to be prions. Prions are infectious proteins without associated nucleic acids. They are extremely difficult to destroy and may remain viable in the soil for many years. The exact mode of transmission for this disease is unknown, although it is believed that the agent responsible for CWD may be spread both directly (i.e., contact from animal to animal) and indirectly (i.e., contact from soil or other substance to animal). It is most important to note that the primary method of spreading CWD is believed to be through the movement of captive cervids.

The incubation period for this disease may be as long as 5 years, and this can make it difficult to detect in herds. CWD cannot be diagnosed on the basis of clinical signs, because several neurological diseases and other maladies may produce similar physical or behavioral abnormalities in deer and elk.

Currently, there is no approved live animal test for CWD, and the diagnosis can only be confirmed through a postmortem, microscopic examination of the brain for lesions and/or for accumulation of abnormal prions.

CWD can reduce the growth and size of wild deer and elk populations in areas where the prevalence is high, and is of increasing concern for wildlife managers across North America. Modeling studies have suggested that CWD could eliminate deer from endemic areas.

The disease was long thought to be limited in the wild to a relatively small endemic area in northeastern Colorado, southeastern Wyoming and southwestern Nebraska, but it has recently been found in new areas of Colorado and Nebraska, as well as in wild deer in New Mexico, South Dakota, Wisconsin, Illinois and Saskatchewan. The disease also has been diagnosed in captive cervid facilities in Colorado, Nebraska, South Dakota, Minnesota, Montana, Oklahoma, Kansas, Wisconsin, Saskatchewan and Alberta.

Without question, CWD is the most serious disease threat facing North America's deer and elk populations. Wildlife management professionals across the United States and Canada are developing and implementing strategies to effectively address this threat.

Here in West Virginia, our agency has taken the following steps to monitor for the presence of CWD and prevent this disease from infecting the state's white-tailed deer herd.

- Since 1999, Wildlife Biologists within the Wildlife Resources Section have been conducting "targeted surveillance" to monitor for the presence of CWD. To date, no CWD has been found in West Virginia.

- The Wildlife Resources Section is expanding its statewide CWD surveillance efforts, and we plan to collect and test more than 300 deer within the next year. This "active surveillance" effort will be ongoing for the next several years.

- Under orders from Director Hamrick, an intensive inspection of 53 captive cervid facilities in the state was recently completed by personnel from both the Law Enforcement and Wildlife Resources Sections.

- On September 27, 2002, the Division of Natural Resources, in collaboration with the West Virginia Department of Agriculture, implemented an emergency rule prohibiting the importation of deer, elk and other cervids into West Virginia.

In closing, I'd like to say that CWD is a relatively new and emerging wildlife disease threat. There are many unknowns associated with CWD, and we are learning more and more about the disease each day. We take this threat very seriously, and we have implemented appropriate strategies designed to enhance surveillance and prevent CWD from infecting our state's deer herd. As our wildlife colleagues in the Canadian province of Manitoba have noted, "We don't have CWD, and we don't want it!"

What can hunters do?

Hunters need to tell political leaders of their concerns over CWD. Indicate your support for increased financial assistance to state wildlife and agricultural agencies to combat CWD. At the state level, if your state has not yet declared a moratorium on all importation of deer and elk into the state, encourage state legislators to take that important step to prevent introduction of CWD. Encourage your state wildlife agency to carefully evaluate the risks associated with game farms. And finally, because any concentration of deer or elk assists in the spread of diseases, stop supplemental feeding programs.

What if I hunt in a state where CWD has not been found?

Concerns over CWD are no reason to not enjoy this hunting season. Take the normal precautions always recommended when dressing wild game. State and provincial wildlife agencies are stepping up their surveillance for CWD, so be alert to their advisories.

Who should I contact to find out more?

Hunters are encouraged to contact their state wildlife agency for more information and updates on status of the disease in that state. Most states now have information on CWD on their web sites that is updated frequently. The Chronic Wasting Disease Alliance web site is at www.cwd-info.org. Check the site frequently for updates to this information.

Produced as a public service by the
National Shooting Sports Foundation
11 Mile Hill Road
Newtown, CT 06470
Phone 203-426-1320
Fax 203-426-1087
www.nssf.org

Questions & Answers on Chronic Wasting Disease for Hunters

Prepared by

The Wildlife Management Institute
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This information was accurate as of July 1, 2002. The Chronic Wasting Disease Alliance web site is at www.cwd-info.org. Check the site frequently for updates to this information.

at is Chronic Wasting Disease (CWD)?

VD is a neurological (brain and nervous system) isease found in deer and elk in certain geographical locations in North America. The disease belongs to a family of diseases known as transmissible spongiform encephalopathies (TSE) or prion diseases. The disease attacks the brains of infected deer and elk and produces small lesions that result in death. While CWD is similar to mad cow disease in cattle and scrapie in sheep, there is no known relationship between CWD and any other TSE of animals or people.

How is it spread?

It is not known exactly how CWD is spread. It is believed that the agent responsible for the disease may be spread both directly (animal to animal contact) and indirectly (soil or other surface to animal). It is thought that the most common mode of transmission from an infected animal is via saliva and feces.

Where has it been found?

CWD is known to infect wild deer and elk in northeastern Colorado and southern Wyoming, and wild deer in western Colorado, western Nebraska, southwestern South Dakota, south-central Wisconsin, south-central New Mexico and west-central Saskatchewan. It has been diagnosed in game ranches in Colorado, Nebraska, South Dakota, Montana, Oklahoma, Kansas, Alberta and Saskatchewan.

s it dangerous to humans?

There currently is no convincing evidence that the gent of CWD affects humans. However, public ealth officials recommend that human exposure to he CWD agent be avoided as they continue to esearch the disease.

What precautions should hunters take?

Health officials advise hunters not to consume meat om animals known to be infected with the disease. oning out meat is recommended. In addition, they ggest hunters take the normal simple precautions hen field dressing carcasses.

How can you tell if a deer has CWD?

Infected animals may not show any symptoms of the disease. In some stages of the disease, however, infected animals begin to lose bodily functions and display abnormal behavior such as staggering or standing with very poor posture. Animals may have an exaggerated wide posture, or may carry the head and ears lowered. Infected animals become very emaciated (thus wasting disease) and will appear in very poor body condition. Infected animals will also often stand near water and will consume large amounts of water. Drooling or excessive salivation may be apparent. Note that these symptoms may also be characteristic of diseases other than CWD.

What should I do if I see a deer that shows CWD symptoms?

Unless your state wildlife agency or another appropriate authority has issued other instructions or regulations, you should accurately document the location of the animal and immediately contact the nearest officer or employee of the State Wildlife Agency. Do not attempt to contact, disturb, kill, or remove the animal.

Can I have deer tested?

In general, the answer is no if you live in an area where CWD has not been documented. Testing is currently only available in areas where CWD has been detected in wild deer. Much effort is being devoted to increasing the laboratories that are certified to do the testing.

Is the meat safe to eat?

While the agent that produces chronic wasting disease in deer and elk has not been positively identified, there is strong evidence to suggest that abnormally shaped proteins, called prions are responsible. Research completed to date indicate that the prions accumulate in certain parts of infected animals -the brain, eyes, spinal cord, lymph nodes, tonsils, and spleen. Based on these findings, hunters are recommended to not eat meat from animals known to be infected with CWD. Hunters in CWD areas are also advised to bone out their meat and to not consume those parts where prions likely accumulate.

What is being done to combat CWD?

Efforts to address CWD are accelerating rapidly. In facilities with captive animals known to have or to have been exposed to CWD, management is concentrating on quarantining or killing of every animal and burning of all carcasses. In some cases around captive populations, double fencing is recommended to prevent direct contact between captive and wild animals

In wild populations, the management option recommended is to reduce the density of animals in the infected area to slow the transmission of the disease. This is being done by selective culling of animals suspected to have been directly exposed to the disease. In Colorado, Nebraska and Wisconsin, large numbers of animals are being killed to reduce density of animals and thus slow the transmission of the disease. There is still a large need for research on the disease as many questions go unanswered. There is also a need for increased funding to support additional laboratories for testing animals for the disease.

Just about every state wildlife agency is now planning an increased effort at surveillance to detect if CWD is present. Many state agencies have banned the importation of deer and elk into the state. Some states have also halted intra-state movement of deer and elk and banned supplemental feeding programs.

Colorado has implemented regulations that allow only boned meat, quarters (without spinal column or head) or processed meat from deer or elk to be transported out of certain areas with CWD. Clean skull plates with antlers attached can also be removed. Check with the state wildlife agency in the state where you hunt to determine if they have enacted similar restrictions.

Chronic Wasting Disease (CWD) Fact Sheet
September 25, 2002

Overview of CWD

- CWD has not been found in West Virginia.
- CWD is a brain and nervous system disease found in deer and elk.
- The disease belongs to a family of diseases known as "transmissible spongiform encephalopathies" (TSE) or prion disease.
- The disease attacks the brains of infected deer and elk and produces small lesions that are always fatal.
- CWD is thought to be spread from animal to animal contact (saliva) and soil or other surface to animals (feces).
- The CWD prion is persistent in the soil and difficult to kill.
- To date, CWD has been found in 11 states and two Canadian Provinces.
- Currently, no convincing evidence exists linking it to humans.
- Symptoms of CWD -- Infected animals in the chronic stage of the disease:

  Begin to loose body functions and display abnormal behavior – staggering or standing with poor posture;

  May carry head and ears lowered;

  Become emaciated (wasting away) with very poor body condition;

  Often stand near water and will consume large amounts of water;

  Drooling or excessive salivation may be apparent;

  Note: These symptoms may also be characteristic of diseases other than CWD

- There is currently no live test for CWD.
- Research completed to date indicate that the prions accumulate in the brain, eyes, spinal cord, lymph nodes, tonsils and spleen of infected animals.

Surveillance for CWD in West Virginia

- Since 1999, wildlife biologists within the West Virginia Division of Natural Resources have been monitoring for CWD in postmortem deer. To date, no CWD has been found in the State.

- The Wildlife Resources Section will expand its statewide CWD surveillance efforts within the next year. More than 300 deer will be collected and tested for CWD.

- Targeted areas of the state will be sampled in subsequent years.

Importation of Cervids into West Virginia

- The Division of Natural Resources, in collaboration with the West Virginia Department of Agriculture, implemented an emergency rule prohibiting the importation of deer, elk and other cervids into West Virginia.

- An intensive inspection of 53 captive cervid facilities, licensed as game farms, was recently completed by Division of Natural Resources personnel.

- New requirements were recently implemented to ensure that game farm operators maintain up to date and complete records for onsite inspection by Division of Natural Resources Law Enforcement Section personnel.

- All captive cervids will be permanently marked for monitoring purposes.

Nationwide Surveillance

- Twenty-six states have banned all cervid imports and 22 states prohibit the importation of cervids from any county, region and/or state that is endemic for CWD.

- The United States Department of Agriculture is developing a CWD accreditation program for captive cervids.

- Captive cervid herds have been the source of most CWD transmission to wild herds.

APHIS Factsheet

Veterinary Services

September 2002

Questions and Answers About Chronic Wasting Disease

Q. What is chronic wasting disease?

A. Chronic wasting disease (CWD) is a fatal, neurological disease of farmed and wild deer and elk. The disease has been identified in wild and captive mule deer, white-tailed deer and North American elk, and in captive black-tailed deer. CWD belongs to the family of diseases known as transmissible spongiform encephalopathies (TSEs). TSEs include a number of different diseases affecting animals or humans including bovine spongiform encephalopathy (BSE) in cattle, scrapie in sheep and goats, and Creutzfeldt-Jacob disease (CJD) in humans. Although CWD shares certain features with other TSEs, it is a distinct disease affecting only deer and elk. CWD is a progressive, fatal, degenerative disease. Clinical signs in affected animals include loss of body condition, behavioral changes, excessive salivation, increased drinking and urination, depression, and eventual death. CWD is always fatal. There is no known treatment, vaccine, or live animal test for CWD.

Q. What causes this disease?

A. The agent that causes CWD and other TSEs has not been completely characterized. However, the theory supported by most scientists is that TSE diseases are caused by little understood proteins called prions. Prions are a form of protein normally found in the cells of the nervous system and other body tissues. Stanley Prusiner, a Nobel Prize winning neurologist, first described an abnormal form of prion resistant to enzymes that break down normal proteins. These abnormal, protease resistant prions are referred to as PrPres. PrPres have the ability to transform normal prions into this abnormal state. As the disease progresses, PrPres accumulate in the brain and lymphoid tissues (lymph nodes and tonsils). Accumulation of these abnormal PrPres produce tiny sponge–like holes in the brain that are visible microscopically. The word "spongiform" in TSEs describes the sponge–like condition of brain tissue found in infected animals. As the disease progresses, the affected animal loses its basic physical and mental abilities.

Q. What is the history of CWD?

A. The following is a brief chronology of CWD:

- CWD was first described clinically as a wasting syndrome in captive deer belonging to Colorado research facilities in 1967. A few years later it was described in a Wyoming research facility.
- CWD was first determined to be a TSE in 1978 by Dr. Elizabeth Williams of the University of Wyoming.
- The first cases of CWD in wild deer and elk were diagnosed in 1981 in Colorado and 1985 in Wyoming.
- Beginning in the 1980s, the distribution of CWD in wild deer and elk in Colorado and Wyoming was determined through surveillance by wildlife agencies in those States. Through their efforts, an endemic area for the disease in wildlife in their States was described. This area includes much of northeastern Colorado and southeastern Wyoming.
- In 2001, discovery of a positive wild mule deer in neighboring Kimball County, NE, extended the endemic area into southwestern Nebraska.
- From 1996 to June 2002, CWD was diagnosed in farmed elk herds in Colorado, Kansas, Montana, Nebraska, Oklahoma, South Dakota, and the Canadian Provinces of Alberta and Saskatchewan.
- From 2000 to June 2002, CWD has also been found in wild deer in northwestern Nebraska, southern New Mexico, southwestern South Dakota, south–central Wisconsin, northwestern Colorado, and the Canadian Province of Saskatchewan.

Q. What are the symptoms of CWD?

A. CWD is a slow and progressive disease. Because the disease has a long incubation period, elk and deer with CWD may not produce any visible symptoms of the disease for a number of years after they become infected. As the disease progresses, deer and elk with CWD show changes in behavior and appearance. These clinical signs may include progressive weight loss, stumbling, tremors, lack of coordination, blank facial expressions, excessive salivation, loss of appetite, excessive thirst and urination, listlessness, teeth grinding, abnormal head posture, and drooping ears. Because of effects on the central nervous system, animals can have difficulty in swallowing, resulting in pneumonia caused by aspiration of food or saliva. Clinical signs of CWD are usually present a few weeks to several months before the animal dies. Unfortunately, these

signs are not specific to CWD and can occur with other diseases or malnutrition.

Q. How is CWD transmitted?
A. The exact mechanism of transmission is unclear. Evidence suggests CWD is transmitted directly from one animal to another (lateral or horizontal transmission). The route by which the agent is shed from the animal's body is unknown. However, experimental and circumstantial evidence suggests that indirect transmission from an environment contaminated with the agent appears to be possible. Transmission of CWD has not been associated with any particular feeding practice or regimen in farmed elk or deer. Supplemental feeding of wild elk and deer, however, concentrates the animals and may contribute to disease spread.

Q. Is there any way to destroy the infectious agent?
A. A characteristic of all TSE agents is their resistance to conventional disinfectants, high temperatures, and enzymes that normally break down proteins. Recommendations for disinfection of areas in which infected animals have resided are still being developed.

Q. Is the disease transmissible to humans?
A. The Centers for Disease Control and Prevention has issued this statement: "It is generally prudent to avoid consuming food derived from any animal with evidence of a TSE. To date, there is no evidence that CWD has been transmitted or can be transmitted to humans under natural conditions. However, there is not yet strong evidence that such transmissions could not occur. To further assess the possibility that the CWD agent might occasionally cause disease in humans, additional epidemiologic and laboratory studies could be helpful. Such studies include molecular characterization and strain typing of the agents causing CWD in deer and elk and CJD in potentially exposed patients. Ongoing national surveillance for CJD and other neurological cases will remain important for continuing to assess the risk, if any, of CWD transmission to humans."

Q. Is the disease transmissible to domestic livestock?
A. During the approximately two decades of monitoring, researchers have not found any evidence that CWD can be transmitted to domestic cattle under natural conditions. Ongoing experiments involving oral exposure and contact exposure on heavily CWD contaminated sites have not resulted in infection of cattle. These experiments, however, require additional time before they are completed. CWD has been experimentally transmitted by artificial means to mice, ferrets, mink, goats, squirrel monkeys, and calves.

Q. How is CWD diagnosed?
A. Currently, CWD is diagnosed by examining brain and lymphoid tissue (lymph nodes and tonsils) from a dead animal. Tests to confirm CWD are performed in a laboratory, using brain tissue. Immunohistochemical (IHC) staining is the most commonly accepted method of detection and is the standard test used by USDA's National Veterinary Services Laboratories. IHC staining is an antibody-based test. Antibodies bind to abnormal PrPres in the tissue on a slide. Additional steps in the test allow a colored agent to be bound to the abnormal PrPres-antibody complex. Accumulations of color indicate the presence of the abnormal PrPres when the slide is examined microscopically. A CWD-positive animal is one in which the presence of abnormal PrPres has been confirmed in the brain or lymphoid tissues.

A research team in Colorado has recently developed a live animal test for CWD based on the collection of tonsil biopsies for microscopic examination. This test seems to work well in mule deer, but not in elk, and its application may be limited to special circumstances. Scientists are continuing to work on a number of approaches that may provide a rapid postmortem or live animal test for both deer and elk.

Q. Why is it so important that the sample collected for testing include the obex portion of the brainstem?
A. Studies on the distribution of abnormal PrPres in CWD–affected deer and elk have shown that the obex portion of the brainstem is the first place that the abnormal PrPres can be detected in the brain. As the disease progresses, the abnormal PrPres can be detected in multiple locations and, finelly, throughout the brain. Because of this, it is necessary to test the obex to detect CWD in animals that are in the early stages of the disease. It is possible that other parts of the brain may test negative for the presence of disease while the obex would test positive. For white-tailed deer and mule deer (but not elk) some lymphoid tissues from the head (tonsils and retropharyngeal lymph nodes) become positive before the obex does, so these tissues will also be useful in surveillance and monitoring efforts in deer.

Q. What does a negative IHC test mean?
A. A negative test is one in which there is no detectable IHC staining of abnormal PrPres. The interpretation of a negative test depends on the species and the tissue tested. In elk, if the obex is negative, the animal is most likely not infected with the CWD agent. There is the possibility, however, that the animal is infected but the disease process is so early that the abnormal PrPres is not detectable with the current IHC test. Similarly, in white–tailed deer and mule deer if the obex and/or the lymphoid tissue

from the head are IHC–negative, the animal is most likely not infected with CWD. There is the possibility, however, that the disease process is so early that the abnormal PrPres is not detectable by the current IHC test.

Q. What is the USDA doing about CWD?
A. The USDA has taken the following steps to help control the spread of CWD:

- During 1997, USDA began supporting surveillance for CWD in farmed and wild elk and deer in cooperation with State agriculture and wildlife agencies. Farmed elk herds that tested positive for the disease were put under State quarantine.
- In September 2001, $2.6 million in Commodity Credit Corporation (CCC) emergency funds were transferred to USDA to increase the effort to eliminate CWD in farmed elk. These funds paid for enhanced surveillance as well as depopulation of farmed CWD-positive, exposed, and suspect animals with compensation to the owners. In addition, the funds allowed USDA to provide assistance in cleaning and disinfecting premises where positive and exposed animals resided. Factsheets were developed to disseminate CWD information.
- In February 2002, an additional $12.2 million of CCC funding was transferred to APHIS to continue this effort. These funds will also be used to support surveillance and diagnostics in wild elk and deer.
- In April 2002, USDA agreed to purchase farmed elk herds in the endemic area of Colorado where wild animals have tested positive for the disease. Sixteen ranches with about 1,350 animals accepted the offer to purchase their animals for 95 percent of their appraised value.
- USDA continues to provide diagnostic and surveillance support to States with active CWD surveillance and control programs for farmed elk and deer. USDA has proposed a Federal/State/industry certification program for farmed elk and deer.
- USDA has supported efforts to control CWD in wild populations through assistance with diagnostic testing and research.
- In May 2002, USDA and the U.S. Department of Interior formed a joint working group on CWD. The purpose of the group is to ensure a coordinated and cooperative Federal approach to assisting States, Tribes and Federal land management agencies with CWD response efforts. In June 2002, the working group presented a plan to the Congress.

Q. What can elk and deer farmers do?
A. Elk and deer farmers are strongly urged to enroll in State CWD surveillance and control programs. They should only purchase animals that have been enrolled in a State program or are otherwise known not to have been exposed to CWD.

Q. What precautions should hunters of deer and elk follow?
A. Hunters should be vigilant for identifying elk or deer displaying CWD symptoms. They should report suspected cases to authorities immediately. Several States have issued specific guidelines for hunters.

Q. What is the USDA's official position on CWD sample testing?
A. Official diagnosis of CWD should be performed exclusively by Federal and State regulatory agency laboratories. The international credibility of the U.S. animal health system is in large part predicated on having an established set of government laboratories with the expertise to accurately conduct diagnosis not only for CWD, but also BSE, avian influenza, foot-and-mouth disease, and a host of other diseases of concern. The system is designed not only to ensure consistency and accuracy but also to preserve domestic and international market confidence in U.S. agricultural commodities. Indeed, a "false positive" for any disease could result in unnecessary public concern and costly regulatory action. And in the case of a disease like BSE, a false positive could be devastating, costing the U.S. economy billions of dollars in unnecessary domestic and international market disruption from which it could take years to recover.

Q. Can this test be used to determine if an animal is safe for human consumption?
A. Because of the limitations of currently available tests for CWD, testing serves purely as a surveillance tool to determine the geographic parameters and prevalence of the disease in the United States. A positive test result can be used as reliable information that the disease has spread into a given area. However, a negative test result is not necessarily a reliable indicator that an animal is free of the disease. Indeed, at this time no test that can be used reliably on individual animals to determine whether that a nimal is free from CWD and whether the meat is safe to eat. This is because the disease has a very long incubation period, which leads to a high "false negative" rate during early infection. In addition, relatively little is known about the distribution of the CWD agent, so an animal whose brain and nervous system tissue tests negative might actually be carrying the infective agent in its muscle or other tissues.

Q. What test is used as the official test for CWD surveillance?

A. In order to ensure the integrity of the U.S. surveillance effort, USDA has designated an official test for CWD surveillance: the IHC assay as performed by APHIS's National Veterinary Services Laboratories (NVSL) and State/university laboratories with which NVSL has contracted. Employees at these laboratories, as part of a national network, are being trained,and the laboratories are being proficiency tested, and supplied with control samples to perform official tests. They will be linked through a reporting database. Currently, 10 laboratories with which APHIS has contracted perform CWD testing, and APHIS is working to bring another 5 on line by January 2003. This capacity is more than sufficient to handle the increased surveillance testing planned this fall to determine the geographic distribution and prevalence of CWD in the United States.

APHIS Factsheet

Veterinary Services

October 2001

Chronic Wasting Disease

Chronic wasting disease (CWD) is a transmissible spongiform encephalopathy (TSE) of deer and elk. To date, this disease has been found only in cervids (members of the deer family) in North America. First recognized as a clinical "wasting" syndrome in 1967 in mule deer in a wildlife research facility in northern Colorado, it was identified as a TSE in 1978. CWD is typified by chronic weight loss leading to death. There is no known relationship between CWD and any other TSE of animals or people.

In the mid-1980s, CWD was detected in free-ranging deer and elk in contiguous portions of northeastern Colorado and southeastern Wyoming. In May 2001, CWD was also found in free-ranging deer in the southwestern corner of Nebraska (adjacent to Colorado end Wyoming). The limited erea of northern Colorado, southern Wyoming, and southwestern Nebraska in which free-ranging deer and/or elk positive for CWD have been found is referred to as the endemic area. Soon after diagnosis of the disease as a TSE, Colorado and Wyoming wildlife management agencies stopped the movement of deer and elk from their research facilities; wild cervids have not been translocated from the endemic area.

CWD also has been diagnosed in farmed elk herds in a number of States and in one Canadian province. The first positive farmed herd in the United States was detected in 1997 in South Dakota. Since then, 16 additional positive herds have been found: South Dakota (6), Nebraska (3), Colorado (5), Oklahoma (1), and Montana (1). As of October 2001, 6 of these 17 positive herds remain under State quarantine. Ten of the herds have been depopulated or have been slaughtered and tested, and the quarantine has been lifted from one herd that underwent rigorous surveillance with no further evidence of disease. CWD also has been found in farmed elk and free-ranging mule deer in the Canadian province of Saskatchewan. For more information on CWD in Canada visit the Canadian Food Inspection Agency Web site at www.inspection.gc.ca/english/anima/heasan/disemala/cwdmdce.shtml.

Species that have been affected with CWD include Rocky Mountain elk, mule deer, white-tailed deer, and black-tailed deer. Other ruminant species, including wild ruminants and domestic cattle, sheep, and goats, have been housed in wildlife facilities in direct or indirect contact with CWD-affected deer end elk with no evidence of disease transmission. There is ongoing research to further explore the possibility of transmission of CWD to other species.

Causative Agent

The agent responsible for CWD (and other animal TSEs, such as scrapie and bovine spongiform encephalopathy) has not been completely characterized. There are three main theories on the nature of the agent that causes CWD: (1) the agent is a prion, an abnormal form of a normal protein, known as cellular prion protein, most commonly found in the central nervous system. The abnormal prion protein "infects" the host animal by promoting conversion of normal cellular prion protein to the abnormal form; (2) the agent is an unconventional virus; (3) the agent is a virino, or "incomplete" virus composed of nucleic acid protected by host proteins. The CWD agent is smaller than most viral particles and does not evoke any detectable immune response or inflammatory reaction in the host animal. Based on experience with other TSE agents, the CWD agent is assumed to be resistant to enzymes and chemicals that normally break down proteins, as well as resistant to heat and normal disinfection procedures.

Clinical Signs

Most cases of CWD occur in adult animals. The disease is progressive and always fatal. The most obvious and consistent clinical sign of CWD is weight loss over time. Behavioral changes also occur in the majority of cases, including decreased interactions with other animals, listlessness, lowering of the head, blank facial expression, and repetitive walking in set patterns. In elk, behavioral changes may also include hyperexcitability and nervousness. Affected animals continue to eat grain but may show decreased interest in hay. Excessive salivation and grinding of the teeth also are observed. Most deer show increased drinking and urination.

Diagnosis

Research is being conducted to develop live-animal diagnostic tests for CWD. Currently, definitive diagnosis is based on postmortem examination (necropsy) and testing. Gross lesions seen at necropsy reflect the clinical signs of CWD, primarily emaciation. Aspiration pneumonia, which may be the actual cause of death, also is a common finding in animals affected with CWD. On microscopic examination, lesions of CWD in the central nervous system resemble those of other TSEs. In addition, scientists use a technique called immunohistochemistry to test brain tissue for the presence of the abnormal prion protein to diagnose CWD.

Epidemiology

The origin and mode of transmission of CWD is unknown. Animals born in captivity and those born in the wild have been affected with the disease. Basad on epidemiology, transmission of CWD is thought to be lateral or from animal to animal; although maternal transmission may occur, it appears to be relatively unimportant in maintaining epidemics.

Surveillance

Surveillance for CWD in free-ranging deer and elk in Colorado and Wyoming has been ongoing since 1983, and to date, has confirmed the limits of the endemic areas in those States. CWD in free-ranging deer in Nebraska was detected in 2000/2001; more intensive surveillance to better define the prevalence and distribution of the disease in free-ranging deer in Nebraska is underway. In addition, an extensive nationwide surveillance effort was started in 1997-98 to better define the geographic distribution of CWD in free-ranging cervids in the United States. This surveillance effort is a two-pronged approach consisting of hunter-harvest cervid surveys conducted in many States, as well as surveillance throughout the entire country targeting deer and elk exhibiting clinical signs suggestive of CWD. Over 15,000 harvested free-ranging deer and elk have been tested to date, including over 8,000 animals harvested from outside of the endemic area. In the United States no CWD-positive free-ranging animals have been found outside of the endemic area.

Surveillance for CWD in farmed elk began in 1997 and has been a cooperative effort involving State agriculture and wildlife agencies and the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS). Farmed cervid surveillance has been increasing each year since 1997 and will be an integral part of the USDA program to eliminate CWD from farmed elk.

Management

Colorado and Wyoming wildlife management agencies and USDA are continuing to invest resources in CWD research efforts. In addition, the Colorado Division of Wildlife is currently developing and implementing a management plan for CWD in free-ranging cervids. APHIS has provided assistance to State officials in diagnosing CWD and in monitoring international and interstate movements of animals to help prevent further spread of CWD. Also, APHIS is developing a program to eliminate CWD from farmed elk. In addition, many State animal health regulatory agencies have instituted CWD programs for farmed elk. All of these agencies are committed to limiting the distribution of the disease in free-ranging deer and elk to the current localizad area and decreasing its occurrence in both the free-ranging and farmed deer and elk populations.

Additional Information

For more information from APHIS about CWD in farmed cervids, contact:

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For more information about CWD in free-ranging cervids, contact:

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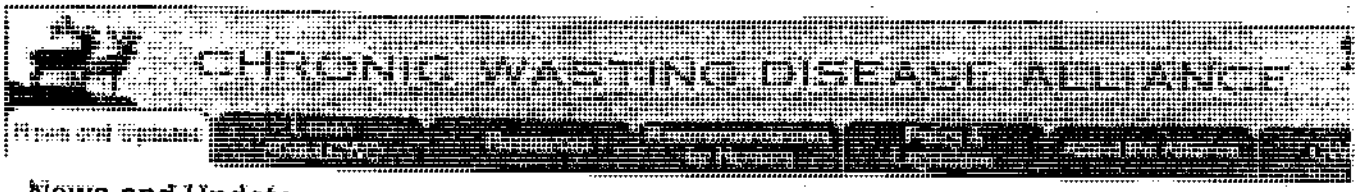
Current information on animal diseases and suspected outbreaks is also availeble on the Internet at http://www.aphis.usda.gov.



News and Updates

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National News : FDA Studies to Assess Risk to Human Health; NIH Intensifies Prion Disease Research

Date: November 04, 2002
Source: HHS Press Office

Contacts:
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(202) 690-6343

HHS Secretary Tommy G. Thompson announced today that the Food and Drug Administration (FDA) will commission two studies to assess the human health risk of chronic wasting disease (CWD), part of a comprehensive effort to combat the spread of the disease in deer and elk herds across the country.

Overall, HHS has proposed spending more than $29.2 million in fiscal year 2003 to expand research efforts to fight the growing threat of prion diseases, including CWD among the nation's deer and elk populations.

"We must determine whether CWD is a threat to our food supply and how best to stop the spread of this disease in our deer and elk herds," Secretary Thompson said. "We will aggressively pursue innovative methods to expand research and direct assistance to states to fight the spread of CWD."

The FDA-commissioned studies will be a formal risk assessment regarding the present potential human health consequences of CWD and the transmissibility of CWD. The purpose of these studies will be not only to try to determine and, if present, quantify the human health risk, but also to identify areas were data gaps exist and where research efforts should be focused to reduce the potential threat to health posed by CWD.

The FDA studies are being commissioned as the National Institutes of Health (NIH) has intensified its efforts to understand and fight this disease. Recently, a component of NIH, the National Institute of Allergy and Infectious Diseases(NIAID), awarded a 7-year, $8.4 million contract to Colorado State University to establish an emerging disease research center focused on CWD. Additionally, scientists at NIAID's Rocky Mountain Laboratories (RML) in Hamilton, Montana, have initiated studies aimed at developing new therapies against CWD; and soon they will start critical experiments to answer a key question -- can this disease be transmitted from deer or elk to monkeys, another model for assessing the potential for human transmission.

CWD is one form of a group of fatal brain diseases called transmissible spongiform encephalopathies, or TSEs. These diseases include bovine spongiform encephalopathy (BSE or "mad cow" disease) in cattle, scrapie in sheep and Creutzfeldt-Jakob disease in humans. The hallmark of TSE disease is accumulation in the brain of abnormal prion proteins -- misshapen versions of the normal prion proteins found on the surface of brain cells. There is no evidence that CWD has caused illness in humans.

NIH has budgeted an estimated $24.3 million for TSE research in fiscal year 2002 and has

requested $26.4 million in fiscal year 2003 -- an 8.7 percent increase. Secretary Thompson called on Congress to move quickly to approve HHS budget for fiscal year 2003, which began Oct. 1.

"At a time when this devastating disease is harming deer and elk herds throughout America, we must do all we can to provide additional resources to research and combat CWD," Secretary Thompson said. "This is groundbreaking research that will have tangible implications for hunters and farmers."

Scientists do not know yet whether deer or elk with CWD might also transmit some form of TSE disease to people who eat or have close contact with them. With CWD beginning to spread over a wider geographical area in the United States, however, answering this question is of critical public health importance.

The new Colorado research center in Ft. Collins, headed by Edward Hoover, Ph.D., D.V.M., will investigate the mechanics of CWD infection in deer and elk, especially in the immune system's lymphoid tissues. Such studies underlie the search for improved diagnostics and therapies. The researchers also will seek to better understand the entire spectrum of disease transmission and under what circumstances CWD might "jump" to other species. In addition, scientists at the center will work on a possible vaccine to prevent the spread of CWD in deer and elk. Glen Telling, Ph.D., of the University of Kentucky, will be a close collaborator with Dr. Hoover in this effort. Dr. Telling's work is supported in part by the National Institute of Neurological Disorders and Stroke, another NIH component.

Researchers at NIAID's RML have been studying TSE diseases, particularly scrapie, for decades, and have directed attention to CWD during the last few years. RML scientists plan to investigate whether the abnormal CWD prion protein, presumed to be the agent that causes the disease, can be transmitted from deer or elk to monkeys if the monkeys eat meat containing the abnormal prion proteins. That knowledge would provide valuable insight into whether or not CWD could be transmitted to humans. Recently, RML scientists established that another TSE disease, hamster scrapie, could jump species -- adapting to and causing disease in mice.

RML scientists also are collaborating with researchers at Utah State University to test several new compounds, developed by NIAID scientists, that show promise in blocking the formation of abnormal prion proteins and therefore may one day be used as therapies to treat CWD or other TSE diseases. Some of these compounds may be able to decontaminate meat or other products infected with abnormal prion proteins.

RML scientists have also designed transgenic mice that promise to make studying CWD faster and less expensive. These mice carry the prion proteins of deer and elk, so their bodies react to the disease as a deer or elk would. That means scientists can study the disease in these mice rather than in the larger animals, which are much more expensive and labor-intensive to keep.

Finally, RML scientists have identified important differences between how CWD progresses in deer and how it progresses in elk. This discovery provides new insight into the nature of the disease.

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Bob Wise
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Ed Hamrick
Director

July 9, 2002

MEMORANDUM TO: District Game Biologists and Game Management Services Biologists

FROM: Paul Johansen

SUBJECT: *SCWDS Briefs* - Special Chronic Wasting Disease (CWD) Issue

Attached, please find a Special CWD Issue of the *SCWDS Briefs* prepared by the Southeastern Cooperative Wildlife Disease Study. The purpose of this special issue is to provide historical and up-to-date facts about CWD and other transmissible spongiform encepalopathies. This is an excellent summary of the current state-of-knowledge relating to the CWD situation in North America. Please share this information with your staff.

Attachment

cc: Curtis Taylor — Assistant Chiefs
Dick Hall — Jim Evans
Scot Warner — Alan Glasscock
Steve Wilson — Chris Ryan

SCWDS BRIEFS

A Quarterly Newsletter from the
Southeastern Cooperative Wildlife Disease Study
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The University of Georgia Athens, Georgia 30602
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Gary L. Doster, Editor

Volume 18 April 2002 Number 1

SPECIAL CWD ISSUE

The recent discovery of chronic wasting disease (CWD) in wild deer in new locations in Colorado, Nebraska, South Dakota, and Wisconsin has led to unprecedented attention and concern for a wildlife health issue. A short list of CWD-related events in the last few months includes complete bans on live cervid importation in several states, management plans to kill as many wild cervids as possible in areas in Wisconsin and Colorado where CWD recently was found, depopulation of captive elk herds in the CWD endemic area of northeastern Colorado, and a congressional hearing on CWD. A joint CWD Task Force co-chaired by the Administrator of USDA's Animal Plant and Health Inspection Service (APHIS) and the Director of the U.S. Fish and Wildlife Service was formed in mid-May. Within this task force, six working groups have been directed to develop a 5-year national management plan for CWD.

News about CWD now comes to wildlife management and animal health authorities on a daily basis and it has become challenging to stay informed about this rapidly evolving situation. The purpose of this special issue of the SCWDS BRIEFS is to provide historical and up-to-date facts about CWD and other transmissible spongiform encephalopathies. Several persons assisted with this special issue, and we are grateful to them: Lynn Creekmore, Linda Detwiler, Lisa Ferguson, and Tom Gomez with USDA-APHIS; Bruce Morrison of the Nebraska Game and Parks Commission; Ron Fowler of the South Dakota Department of Game, Fish, and Parks; and Beth Williams of the University of Wyoming. Additional sources of information, including scientific articles, book chapters, and agency websites, are listed for further reading. Updates on CWD and other wildlife health topics will be provided in future issues of the SCWDS BRIEFS.

Transmissible Spongiform Encephalopathies

Transmissible spongiform encephalopathies (TSEs) are invariably fatal diseases of the central nervous system that occur in domestic and wild animals and humans. TSEs in domestic animals include scrapie of sheep and goats, transmissible mink encephalopathy (TME), and bovine spongiform encephalopathy (BSE, also known as mad cow disease). Chronic wasting disease (CWD) is the only TSE currently found in free-ranging wildlife (white-tailed deer, mule deer, and elk), and it also has been found in captive animals of like species. Human TSEs include Creuzfeldt-Jakob disease (CJD), new variant CJD, kuru, Gerstmann-Straussler-Scheinker syndrome, and fatal familial insomnia.

Although each of these TSEs is considered different, they all share important characteristics and thus are grouped together. Scientific debate continues about the cause of TSEs, but all are thought to be caused by the same type of infectious agent. The most widely accepted theory describes TSE agents as abnormal, proteinaceous, infectious particles (prions) that are closely related to a cell protein normally

produced in the central nervous system, lymphoid tissue, and many other body tissues. However, abnormal TSE prions cannot be broken down by the body's enzyme protease. Researchers call the normal form of the cell protein PrP^{c}, whereas the enzyme-resistant form is shaped differently and is generically known as PrP^{res}. Following introduction into the body, PrP^{res} promotes conversion of normal PrP^{c} to more of the undegradable PrP^{res} in lymphoid tissues and brain cells. The end result is a pathologic accumulation of PrP^{res} in brain cells that results in nerve cell death and loss of neurologic function. Two unique aspects of PrP^{res} include lack of genetic material (DNA or RNA) and extreme resistance to breakdown by environmental conditions, disinfectants, and treatments that normally inactivate infectious disease agents such as viruses, bacteria, fungi, etc. All TSEs are characterized by long incubation periods, ranging up to several years, and currently there are no treatments or vaccines.

There are several ways that TSEs can develop. In human beings, sporadic TSEs may develop when some of the person's normal prions (PrP^{c}) spontaneously change into PrP^{res} thereby altering the person's normal PrP^{c} in a chain reaction. Inherited cases occur in people who receive a defective gene that codes for the PrP^{c} protein, causing it to be shaped abnormally. Finally, acquired cases may arise when PrP^{res} from an affected individual is transferred to another through contact with infected central nervous system tissue or contaminated medical instruments. In animals, TSEs are acquired; the spontaneous or inherited forms have not been found, although they may occur. Studies in animals reveal that after PrP^{res} is ingested, the disease agent spreads from the gastrointestinal tract to the spinal cord and brain. There is no apparent immune response to the disease agent and inflammation is not seen in affected tissues. All TSEs of domestic and wild animals and humans have characteristic damage to brain cells (neurons) that results in a spongiform degenerative change in the gray matter when the brain is examined microscopically, thus the term "spongiform encephalopathy." PrP^{res} can be detected in affected brain tissue and also in normal-appearing lymphoid cells of infected hosts with certain TSEs such as scrapie and CWD. The latter feature may prove useful for diagnosis via detection of the TSE agent. The distribution of PrP^{res} is very limited with other TSEs, such as BSE. (Prepared by Nicole Gottdenker and Vic Nettles).

Additional sources of information:

Williams, Elizabeth S., Michael W. Miller, and E. Tom Thorne. Chronic Wasting Disease: Implications and Challenges for Wildlife Managers. *Transactions of the 67th North American Wildlife and Natural Resources Conference.* In Press.

Centers for Disease Control and Prevention (www.cdc.gov)

National Institutes of Neurological Disorders and Stroke (www.ninds.nih.gov)

USDA's Animal and Plant Health Inspection Service (www.aphis.usda.gov)

TSEs of Domestic Animals and Humans

The earliest historical records of transmissible spongiform encephalopathies (TSEs) began with sheep scrapie more than 250 years ago in England. Microscopic brain lesions of scrapie were described in the 19th century, and its transmissible nature and long incubation period were demonstrated experimentally in the 1930s. The scrapie agent is thought to spread from animal to animal, primarily from an infected ewe to her offspring, and to other lambs through contact with the placenta or placental fluids. Clinical signs usually appear between 2 and 5 years after infection but may not occur until much later. Affected sheep and goats show progressive neurologic disease, including behavioral changes, head and neck tremors, ataxia, and self-trauma due to incessant itching. Death typically occurs within 1 to 6 months or longer after the onset of clinical signs. In the

United States, scrapie was first diagnosed in 1947 in a flock that had received sheep of British origin. Scrapie has been identified in more than 1,000 flocks in the United States, and currently it is the target of an eradication program administered by the USDA's Animal and Plant Health Inspection Service. There is no evidence to indicate that scrapie poses a risk to human health.

A few outbreaks of transmissible mink encephalopathy (TME) have been reported in ranched mink in Europe and North America. This rare TSE has never been found in wild mink. Outbreaks are believed to be caused by exposure to the infectious agent, such as by eating contaminated feed, and are characterized by 60% to 100% morbidity within a ranched mink population and 100% mortality of affected mink. Affected animals initially show behavioral changes, aggression, and ataxia; later they become moribund and die. Although TME is not a significant disease of domestic animals or humans, it has great utility as an experimental TSE model.

Several TSEs occur in humans. Kuru is a TSE of the Fore natives of the highlands of New Guinea who performed ritual cannibalism of relatives after natural death. Kuru essentially has disappeared since mortuary cannibalism practices were discontinued. Gerstmann-Straussler-Scheinker Syndrome and fatal familial insomnia are extremely rare hereditary TSEs that have been demonstrated to be transmissible under laboratory conditions. They are found in just a few families around the world. Although quite rare, the most common TSE in humans is classic Creutzfeldt-Jakob Disease (CJD), with a worldwide incidence of approximately one case per one million people per year. Disease usually develops later in life; the typical age of onset is around 60 years. As with all TSEs, CJD is characterized by progressive neurological disease that is invariably fatal.

In 1996, researchers recognized a "new variant" of Creutzfeldt-Jakob Disease (vCJD) in British people. The most likely explanation of this new form of the disease was exposure to the BSE agent. Additional research since that time has found epidemiological and laboratory evidence to further support the causal association between BSE and vCJD, thus linking vCJD with consumption of products contaminated with central nervous system tissue of cattle with BSE. BSE is the only TSE of domestic or wild animals ever linked with human disease. Human patients with vCJD generally were much younger at the age of death (median age of 28) than victims of sporadic CJD (median age of 68), and the microscopic features of vCJD differed from classic CJD. Since it was first recognized, vCJD has been documented as the definite or probable cause of death or disease of 130 people in the United Kingdom (121), France (6), Ireland (1), Italy (1), and the United States (1). The single probable case in the United States was reported in April 2002 in a young woman who had come to the United States after spending much of her life in the United Kingdom. There never has been a case of vCJD that did not have a history of exposure within a country where BSE was occurring. The epidemiological and laboratory evidence linking BSE and vCJD is very strong and a cause of concern among public health officials, citizens, and meat industries of Great Britain and other countries around the world.

Bovine spongiform encephalopathy (BSE) was recognized in the mid-1980s in cattle in Great Britain. BSE is covered at length in the following article. (Prepared by Nicole Gottdenker and John Fischer)

Additional sources of information:

Williams, Elizabeth S., Michael W. Miller, and E. Tom Thorne. Chronic Wasting Disease: Implications and Challenges for Wildlife Managers. *Transactions of the 67th North American Wildlife and Natural Resources Conference*. In Press.

Centers for Disease Control and Prevention (www.cdc.gov)

National Institutes of Neurological Disorders and Stroke (www.ninds.nih.gov)

UK CJD Surveillance Unit (www.cjd.ed.ac.uk)

USDA's Animal and Plant Health Inspection Service (www.aphis.usda.gov)

Bovine Spongiform Encephalopathy

Since 1986, more than 180,000 cases of bovine spongiform encephalopathy (BSE), also known as mad cow disease, have been reported in numerous European countries and Japan, with more than 95% of the cases occurring in Great Britain. Neither BSE nor any other transmissible spongiform encephalopathies (TSEs) have been detected in cattle in the United States, despite more than 12 years of active surveillance. The British BSE epidemic apparently arose through the feeding of ruminant-derived protein contaminated with a TSE agent suspected to be a strain of sheep scrapie or a previously unrecognized TSE in cattle. The epidemic was sustained and boosted by recycling of BSE infected cattle to other cattle via feeds containing ruminant meat and bone meal. Epidemiological studies suggest widespread exposure of British cattle via contaminated commercial feed as early as 1980, and it is believed that changes in rendering procedures in the 1970s and 1980s resulted in failure to inactivate the TSE agent. Transmission of BSE is primarily, if not solely, through this contaminated feed route as additional studies indicate that there has been little or no horizontal spread from animal to animal, as occurs with scrapie and chronic wasting disease. In Great Britain, the BSE epidemic peaked in early 1993 with an incidence of more than 1,000 new cases per week. As a result of feed bans initiated in 1988, the incidence has dropped markedly and currently runs about 25 new cases per week.

Transmissible spongiform encephalopathies have affected other species, including domestic and exotic cats, in which it is known as Feline Spongiform Encephalopathy (FSE), as well as exotic ruminants in zoological collections. BSE is believed to have affected 10 bovid and felid species from zoos in the British Isles, viz., eland, greater kudu, nyala, oryx, gemsbock, bison, cougar, ocelot, tiger, and cheetah. The agent isolated from several of these cases of FSE and the TSE of exotic ruminants is indistinguishable from BSE in cattle using strain typing in mice, suggesting the occurrence of TSEs in these species resulted from BSE-contaminated feed.

Without doubt, the great publicity and concern surrounding BSE is due to its epidemiological and laboratory-supported link with new variant CJD (vCJD) in humans. This new human TSE was first recognized in Great Britain in 1996 and appears to be associated with the consumption of BSE-infected cattle products, specifically beef products contaminated with central nervous system tissue containing the BSE agent. To date, there have been 130 definite or probable cases of vCJD in humans. Although there is strong evidence that the BSE agent is responsible for vCJD cases, the specific foods possibly associated with transmission to humans are unknown. In cattle experimentally infected by the oral route, the BSE agent has been identified in brain, spinal cord, retina, nerve roots near the vertebrae, and bone marrow. In naturally infected cattle, the agent has been found only in brain, spinal cord, and retina.

Control measures for BSE in the United Kingdom and other affected countries include bans on animal-derived proteins in livestock feeds; prohibitions on the use of specified risk materials in any food, feed, or biological product; culling of cattle at highest risk of infection; and stringent regulations or bans on the movement of animals and animal products. Countries without BSE have employed import restrictions and similar measures to prevent its introduction and spread.

Since 1989, the United States has banned importation of ruminants and most ruminant

products from countries identified as having BSE or at risk for having BSE. Cattle imported from high-risk countries prior to the ban have been euthanized and tested for BSE or have been quarantined and monitored. There is a U.S. ban on the importation of processed animal protein products, regardless of species, from BSE-restricted countries. Since 1997, the U.S. Food and Drug Administration (FDA) has banned the use of most mammalian protein in ruminant feeds and has issued guidelines concerning the use of bovine materials from BSE-restricted countries in human medical products. Since 1990, the USDA's Animal and Plant Health Inspection Service (APHIS) has conducted an active surveillance program for BSE. Samples are obtained from the target high-risk population -- adult cattle that exhibit neurological signs, non-ambulatory ("downer") cows, and animals that die of unknown causes. More than 26,000 animals in the United States have been tested for BSE to date with uniformly negative results.

In 1998, the USDA entered into a cooperative agreement with Harvard University's School of Public Health to conduct an analysis and evaluation of potential pathways for BSE to enter the U.S. national cattle herd or food supply. Harvard assessed the pathways by which BSE could potentially occur in the United States, pathways by which humans could potentially be exposed to the BSE agent from beef products, and identified additional measures that could be taken to protect human and animal health in the United States. The results of this analysis, made public in November 2001, found that the United States is highly resistant to the introduction and spread of the BSE agent in the U.S. cattle herd due to existing federal regulatory programs. The measure identified as most effective in reducing the spread of BSE is the ban instituted by FDA to prevent recycling of potentially infectious cattle tissues. (Prepared by John Fischer)

Additional sources of information:

Centers for Disease Control and Prevention (www.cdc.gov)

United Kingdom's Department for Environment, Food, and Rural Affairs (www.defra.gov.uk)

USDA's Animal and Plant Health Inspection Service (www.aphis.usda.gov)

Chronic Wasting Disease 101

Concern about chronic wasting disease (CWD) is increasing for wildlife managers, animal health authorities, captive cervid owners, and the public across North America. Many biological features of CWD pose significant challenges for those attempting to control or eradicate the disease. Perhaps even greater challenges are those associated with balancing complex and often competing and conflicting interests of the general public, sportsmen, the game farming industry, traditional livestock industries, and many state and federal animal health and public health agencies.

Chronic wasting disease was first recognized in the 1960s as a syndrome of captive mule deer held in several wildlife research facilities in Ft. Collins, Colorado. Originally believed to be a nutritional malady, CWD was not recognized as a transmissible spongiform encephalopathy (TSE) until 1978. CWD soon was identified in captive deer and elk from other wildlife research facilities near Kremmling and Meeker Colorado, and at Wheatland, Wyoming, as well as in at least two zoological collections. By the 1980s, CWD had been documented in free-ranging deer and elk in northeastern Colorado/southeastern Wyoming, and active surveillance in 2000 revealed that this endemic area extended into adjacent western Nebraska. From 1996 through early 2002, CWD has been diagnosed in privately owned captive elk herds in Colorado, Kansas, Montana, Nebraska, Oklahoma, South Dakota, and the Canadian provinces of Alberta and Saskatchewan. From late 2000 to April 2002, CWD also has been detected in wild deer at locations in northwestern Nebraska,

Saskatchewan, South Dakota, Wisconsin, and on the Western Slope of Colorado.

The origin of CWD is unknown, and it may never be possible to definitively determine how or when CWD arose. It is possible that CWD was derived from scrapie, a TSE of domestic sheep recognized in the United States since 1947. Arguments can be made both for and against this hypothesis. It also is possible that CWD is a spontaneous TSE that arose in deer in the wild or in captivity and has biological features promoting transmission to other deer and elk. The majority of cases of the human TSE Creutzfeldt-Jakob Disease (CJD) are thought to be spontaneous. Occurrence of spontaneous CJD is approximately one case per one million humans per year. It is possible, but difficult, to prove that spontaneous CWD may have occurred in deer.

Only three species of the family Cervidae are known to be naturally susceptible to CWD: mule deer (*Odocoileus hemionus)*, white-tailed deer (*Odocoileus virginianus*), and Rocky Mountain elk (*Cervus elaphus nelsoni*), though it is very likely that other subspeeies of *C. elaphus* are susceptible. Susceptibility of other cervid species to CWD is not known. Cattle and other domestic livestock appear to be resistant to natural infection; to date, only 3 of 13 cattle have become infected with the CWD agent following experimental intracerebral inoculation, although this and other experimental studies begun in 1997 are not yet completed.

Chronic wasting disease-affected deer and elk sbow loss of body condition and changes in behavior. The clinical disease often is more subtle and prolonged in elk than in deer. Affected animals may walk repetitive courses; show subtle ataxia and a wide-based stance; have subtle head tremors; be found near water sources or in riparian areas; have periods of somnolence; and may carry their head and ears lowered. Chronic wasting disease-affected animals continue to eat, but amounts of feed consumed are reduced, leading to gradual loss of body condition. Excessive drinking, urination, salivation, and drooling are common in the terminal stages. Death is inevitable once clinical disease occurs.

The clinical course of CWD varies from a few days to approximately a year, with most animals surviving from a few weeks to several months after onset of signs. While a protracted clinical course is typical, occasionally acute death may occur. This may be more common in the wild than in the relative security of captivity. Aspiration pneumonia is a common finding at postmortem examination of terminal CWD cases and presumably is due to difficulty swallowing, hypersalivation, and inhalation of foreign material into the lungs. Thus the brain should be examined for evidence of CWD on every prime age cervid that dies with pneumonia. (Excerpted and modified from: Williams, Elizabeth S., Michael W. Miller, and E. Tom Thorne. Chronic Wasting Disease: Implications and Challenges for Wildlife Managers. *Transactions of the 67th North American Wildlife and Natural Resources Conference*. In Press.)

CWD Epidemiology

Chronic wasting disease (CWD) is both transmissible and infectious, but many details of its transmission remain to be determined. In contrast to bovine spongiform encephalopathy (BSE), CWD is not a foodborne disease associated with rendered ruminant meat and bonemeal. Instead, observations of CWD among captive deer and elk provide strong evidence of lateral transmission, which is more similar to scrapie of sheep and goats. Experimental and epidemic modeling data support these anecdotal observations. Maternal transmission may occur but appears to be relatively rare. Some interspecies transmission probably occurs among the three natural bost species. Apparent transmission from mule deer to elk, mule deer to white-tailed deer, and elk to mule deer and white-tailed deer has been observed.

The presumed CWD agent has been demonstrated by special procedures in various lymphoid tissues, including those of the digestive tract (e.g., tonsil, Peyer's patches, and mesenteric lymph nodes). These distribution patterns suggest that the agent may be shed through the alimentary tract. Because TSE agents are extremely resistant in the environment, transmission may be both direct and indirect. Concentrating deer and elk in captivity or by artificial feeding probably increases the likelihood of direct and indirect transmission between individuals. Contaminated pastures appear to have served as sources of infection in some CWD epidemics; similar phenomena have been suspected in some outbreaks of sheep scrapie. The apparent persistence of the CWD agent in contaminated environments represents a significant obstacle to eradication of the disease from either farmed or free-ranging cervid populations.

The overall duration of CWD infection (time from exposure to end-stage clinical disease) has been difficult to determine in natural cases. Without clear knowledge of when animals become infected, it is impossible to accurately determine the overall course of disease. Experimental CWD challenge studies based on single-dose oral exposure to infectious brain tissue have yielded some insights into the disease course; however, experimental data probably underestimate time frames for natural infections. Experimentally, minimum incubation time was about 15 months, and mean time from oral infection to death was about 23 months (range 20 to 25 months) in mule deer. The range of incubation observed in orally infected elk was approximately 12 to 34 months. The maximum disease course is not known, but can exceed 25 months in experimentally infected deer and 34 months in elk. Duration is less certain in naturally occurring cases. The youngest animal diagnosed with clinical CWD was 17 months old, suggesting 16 to 17 months may be the minimum natural incubation period. Among deer and elk residing in facilities with a long history of CWD, most natural cases occur in 2- to 7-year-old animals; however, deer have lived more than 7 years in heavily infected facilities without succumbing to CWD, and elk more than 15 years of age have succumbed to CWD. It is not known when during the course of infection an animal may become infectious, but it appears likely that shedding of the CWD agent is progressive through the disease course; epidemic models suggest shedding probably precedes onset of clinical disease in both deer and elk.

Chronic wasting disease can reach remarkably high prevalence in captive cervid populations. In one infected research facility, more than 90% of mule deer resident for more than 2 years died or were euthanized while suffering from CWD. Recently, high CWD prevalence (about 50%) has been demonstrated in white-tailed deer confined in association with an infected Nebraska elk farm. Among captive elk, CWD was the primary cause of adult mortality (5 of 7, 71%; 4 of 23, 23%) in 2 research herds, and high prevalence (59%) was detected in a group of 17 elk slaughtered from an infected farm herd.

To estimate prevalence in infected free-ranging populations, tissues from deer and elk harvested by hunters in CWD-endemic areas have been collected and examined at random. Within endemic areas, prevalence of preclinical CWD has been estimated at less than 1% in elk and less than 1% to 15% in mule deer. Modeled CWD epidemics failed to achieve a steady-state equilibrium in infected deer populations, suggesting that CWD may lead to local extirpations of infected deer populations if left unmanaged. (Excerpted and modified from: Williams, Elizabeth S., Michael W. Miller, and E. Tom Thorne. Chronic Wasting Disease: Implications and Challenges for Wildlife Managers. *Transactions of the 67th North American Wildlife and Natural Resources Conference*. In Press.)

CWD Diagnosis

Chronic wasting disease (CWD) cannot be diagnosed on the basis of clinical signs, because

several neurological diseases and other maladies may produce similar physical or behavioral abnormalities in deer and elk. Currently there is no approved live animal test for CWD, and the diagnosis is made by postmortem microscopic examination of brain for lesions (spongiform change with degeneration and loss of neurons) and/or for accumulation of abnormal prions (PrP^{CWD}), the presumed causative agent of CWD.

Microscopic lesions are apparent only after the onset of clinical disease in deer and elk, but PrP^{CWD} accumulation can be detected in animals before clinical signs develop. Although there is widespread PrP^{CWD} accumulation in the brain later in the course of infection when clinical signs are apparent, early accumulation of PrP^{CWD} is known to occur only in a very specific site in clinically normal animals. This site is located in the medulla oblongata of the brainstem directly beneath the cerebellum. With practice, this portion of the brainstem can easily be removed and preserved in formalin for testing. Immunohistochemical (IHC) staining of this area is used to demonstrate the presence or absence of PrP^{CWD}, and currently it is regarded as the only meaningful test for clinically normal animals. A positive IHC result, with or without spongiform lesions, is sufficient to diagnose CWD infection. In some cases, supplementary tests may be employed to confirm a positive IHC result.

Recent investigations have demonstrated a potential live animal test for CWD in mule deer. The procedure involves IHC staining for PrP^{CWD} within lymphoid tissue obtained via tonsil biopsy. Studies have shown that PrP^{CWD} accumulates in lymph nodes and tonsil of mule deer early during CWD incubation. Although useful in special situations for mule deer and potentially of use in whitetails, the tonsil test does not appear to be of use for antemortem CWD testing of elk, due to differences in CWD pathogenesis in this species. Furthermore, there is little chance that this live animal test would have much application on a large scale in wild populations, because individual animals would have to be captured and anesthetized for the biopsy procedure. If test results are positive, the animal would then have to be located and euthanized in most CWD control programs. Several other diagnostic tests for transmissible spongiform encephalopathies in other species, including BSE in cattle and scrapie in sheep, are being evaluated for potential use in CWD diagnostic testing of deer and elk. Some of these tests, if validated, may provide more rapid testing than current IHC procedures. (Prepared by Rick Gerhold)

Additional information:

Williams, Elizabeth S., Michael W. Miller, and E. Tom Thorne. Chronic Wasting Disease: Implications and Challenges for Wildlife Managers. *Transactions of the 67th North American Wildlife and Natural Resources Conference*. In Press.

CWD Surveillance, Doing the Numbers

The known distribution of chronic wasting disease (CWD) has expanded at an alarming rate in the past 2 years, and there will be increasing pressure on wildlife managers to evaluate the status of deer and elk populations under their authority. Unfortunately, detection of CWD or confirmation that the disease is not present will require both hard work and money. The primary test currently available for CWD requires brain tissue from deer or elk, and laboratory costs alone are $20 or greater per animal. The funds necessary to collect and test the number of samples required to reach a defendable position on the absence of CWD in a deer or elk herd will strain wildlife agency budgets, and the flood of samples will overwhelm existing laboratory capabilities nationwide.

How to look for CWD is no simple matter. Presently, the two surveillance strategies generally used are: (1) testing of sick or "target animals" discovered or reported to wildlife agencies (a passive surveillance system) or (2) conducting random surveys of normal deer or elk killed by hunters or agency personnel (an

active surveillance system). CWD "target" animals are defined as deer or elk of 18 months of age or older that are emaciated and showing some combination of signs including abnormal behavior, increased salivation, tremors, stumbling, incoordination, difficulty swallowing, excessive thirst, and excessive urination. Perhaps it would be better to simplify the definition to include ***sick-appearing deer or elk that are emaciated or have neurologic disorders.***

The best epidemiological information available on CWD in wild populations comes from the long-term study of deer and elk in the endemic area in northeastern Colorado and southeastern Wyoming. A crucial fact from this study is low prevalence of CWD infection found in the wild. Overall, prevalence rates in the endemic zone were 4.7% for mule deer, 2% for white-tailed deer, and 0.5% for elk, although there were "hot spots" within the study area that ran as high as 15% in mule deer. Unfortunately, what this means for wildlife biologists is that sample sizes in active surveillance programs must be massive before any credence can be given to negative results. Thus, costs of active surveillance are going to be high.

In contrast, when the aforementioned researchers evaluated their success in diagnosing CWD from clinically ill (target) deer and elk in the endemic area, their overall case positive rates were 57%, 35%, and 44% for mule deer, white-tailed deer, and elk, respectively. They concluded that "targeted surveillance appears to be an effective strategy for detecting new CWD foci." However, it also was concluded that the first clinically ill animals were not apparent in various management units until the prevalence rate was about 1%. Furthermore, the numbers of sick deer submitted from a given management unit did not correspond with the prevalence rate determined by random sampling of that area. They found that the success of targeted surveillance was tied to human activity in the area and the level of concern about the disease.

For the past 4 years, SCWDS has sent a surveillance questionnaire to wildlife management agencies and veterinary diagnostic laboratories seeking reports of target deer and elk that were examined for CWD. We believe that the questionnaires are stimulating increased attention in regard to CWD; however, they revealed marked inconsistencies among states in the detection of "target animals." This was best exemplified by numerous states indicating that no target animals were identified over the course of a year or more. "Targeted surveillance" is a passive system that relies heavily on the public reporting sick animals to appropriate agency personnel and then on follow-up action to acquire and test samples. The aim of targeted surveillance is to locate and test the animals most likely to be infected, thereby reducing surveillance costs, while at the same time enabling coverage of a large geographic area.

Given the expanding concern about CWD, and the very real threat CWD poses to native cervids, wildlife managers can no longer afford to be casual about the discovery of any sick deer or elk. It is imperative that these animals are obtained and tested for CWD. Furthermore, given that active surveillance has been the method by which CWD has been detected among wild deer in several new locations including Saskatchewan, Nebraska, South Dakota, and Wisconsin, it is becoming clear that both surveillance methods should be strongly considered by wildlife management agencies. (Prepared by Vic Nettles)

Additional Information:

Miller, Michael W., et al. 2000. Epizootiology of chronic wasting disease in free-ranging cervids in Colorado and Wyoming. *Journal of Wildlife Diseases 36(4): 676-690.*

CWD Management

There is no treatment or vaccine for chronic wasting disease (CWD). Once clinical signs develop, CWD is invariably fatal. Furthermore,

long incubation periods, subtle early clinical signs, absence of a reliable live animal test, extremely resistant infectious agent, possible environmental contamination, and incomplete understanding of transmission all limit options for controlling or eradicating CWD.

In captive facilities, management options currently are limited to quarantine or depopulation of CWD-infected herds. Two attempts to eradicate CWD from cervid research facilities failed. The causes of these failures were not determined, but residual environmental contamination following depopulation and/or facility clean-up was likely in both cases. Attempts to eliminate CWD from farmed elk populations are more recent, and consequently the efficacy of these attempts remains uncertain. Whether contaminated environments can ever be completely disinfected remains questionable. Until effective cleaning and disinfection procedures are identified, a very conservative approach must be taken when considering reintroduction of captive cervids into commercial facilities where CWD has occurred; moreover, free-ranging cervids also should be excluded from previously infected premises. Inherent difficulties in managing infected captive herds and premises underscore the need for aggressive surveillance to prevent movements of infected animals in commerce.

Managing CWD in free-ranging animals presents even greater challenges. Long-term, active surveillance programs to monitor CWD distribution and prevalence have been instituted in the endemic area in Colorado, Nebraska, and Wyoming to determine its extent and to assist in evaluating both temporal changes and effects of management intervention. Management programs established to date focus on containing CWD and reducing its prevalence in localized areas. Ultimate management goals vary among affected states and provinces. In Nebraska, Wisconsin, Saskatchewan, and on Colorado's Western Slope where CWD may not yet be endemic, eradication is the stated goal for CWD management. In contrast, wildlife managers in the CWD endemic area in Colorado and Wyoming have refrained from committing to eradication because it appears unattainable in their situations.

A variety of specific strategies for managing CWD in free-ranging wildlife have been adopted in affected jurisdictions. Translocating and artificially feeding cervids in endemic areas have been banned in attempts to limit range expansion and decrease transmission. Selective culling of clinical suspects has been practiced throughout the endemic area of Colorado and Wyoming for a number of years, but this approach alone is insufficient to reduce prevalence in affected populations. Localized population reduction in an area of high CWD prevalence has been undertaken in Colorado as a management experiment, but efficacy remains to be determined. Although it seems intuitive that lowered deer and elk densities should reduce both transmission and likelihood of emigration of infected animals to adjacent areas, historic migration patterns and social behaviors characteristic of some deer and elk populations may diminish the effectiveness of wholesale density reduction in controlling CWD.

Computerized epidemiologic modeling indicates that early and aggressive intervention through population reduction offers the best chance to prevent establishment of new endemic foci. Unfortunately, surveillance limitations (both cost and sensitivity) may delay detection of newly infected free-ranging populations for years after CWD has been introduced. In Nebraska, Saskatchewan, Wisconsin, and on Colorado's Western Slope, aggressive reductions of deer numbers in newly identified positive locations are underway or planned in attempts to eliminate CWD from these areas. The recent development of tonsil biopsy as a live animal test for CWD in deer might aid control efforts under some special conditions, but large-scale applications to free-ranging populations seem impractical.

Where it occurs, CWD in captive and free-ranging cervids presents serious management problems. Captive populations are quarantined,

thus limiting use and value of infected or exposed animals. Indemnity for depopulated cervids has been made available only recently in the United States. In Canada, the magnitude of infection in farmed elk herds detected thus far has cost the Canadian government over $19,000,000 in indemnity and cleanup funds. Guidelines for management of captive herds with CWD are being developed by state and provincial animal health officials. A national program is nearing adoption in Canada, and a similar program currently is under review in the United States. Spillover of CWD into local free-ranging cervid populations may have occurred in two locations; further spillover could establish more endemic foci, thereby impairing long-term viability of both cervid farming and wildlife management in those areas.

Implications for management of free-ranging populations of deer and elk may be even more significant. Agencies do not translocate deer and elk from CWD endemic areas. Ongoing surveillance programs are expensive and draw resources from other wildlife management needs. Perhaps most important, impacts of CWD on population dynamics of deer and elk are presently unknown. Modeling suggests that CWD could substantially harm infected cervid populations by lowering adult survival rates and destabilizing long-term population dynamics. Ultimately, public and agency concerns and perceptions about human health risks associated with all transmissible spongiform encephalopathies may erode participation in sport hunting in the endemic area and also may have dramatic influence on management of free-ranging cervid herds where CWD is endemic. It follows that wildlife management and animal health agencies should continue working to understand, prevent introduction, and limit the distribution and occurrence of CWD in free-ranging and farmed cervids. (Excerpted and modified from: Williams, Elizabeth S., Michael W. Miller, and E. Tom Thorne. Chronic Wasting Disease: Implications and Challenges for Wildlife Managers. *Transactions of the 67th North American Wildlife and Natural Resources Conference.* In Press.)

CWD in Captive Cervids

Although chronic wasting disease (CWD) was recognized in captive deer held in publicly owned research facilities in Colorado in the 1960s, it was not detected in privately owned commercial cervids until 1996 in Saskatchewan. Since then, 1 or more cases of CWD have been confirmed in elk in 39 captive herds in Saskatchewan. Primary or secondary epidemiological links have been found between every infected herd and a single source herd in the province that apparently imported infected elk from a private South Dakota herd in 1989. In another example of international movement of CWD, the disease was diagnosed in captive elk in Korea that reportedly had been imported from Saskatchewan. It was announced in early 2002 that one infected captive elk herd had been found in Alberta, and an epidemiological investigation is underway. CWD is a reportable disease under Canada's federal Health of Animals Act, and the Canada Food Inspection Agency has responsibility for controlling the disease. Nearly 8,000 captive elk in Saskatchewan have been destroyed in eradication efforts to date at a cost of more than $19,000,000 for indemnification and cleanup.

In 1997, South Dakota became the first state to detect CWD within the commercial elk industry. As of May 2002, CWD has been diagnosed in 20 privately owned elk herds in Colorado (7), South Dakota (7) Kansas (1), Montana (1), Nebraska (3), and Oklahoma (1). Epidemiological investigations have disclosed animal movement among some of the infected elk ranches. A group of interconnected facilities near Rapid City, South Dakota, that experienced particularly severe infection appeared to be the original source of CWD for other South Dakota game farms. Additional investigations have revealed that two herds of the infected elk in Nebraska originated in Colorado, infected elk in Oklahoma apparently originated in Montana, and CWD subsequently was confirmed in the

Colorado and Montana source herds. In late 2001, CWD was found in captive elk shipped from an infected Colorado elk ranch to two herds in Colorado and one herd in Kansas. Over the course of several years, exposed animals from the source herd in Colorado had been shipped to captive elk operations in 19 states as well as to more than 40 other commercial facilities in Colorado. The other living elk shipped from this facility have been traced, euthanized, and tested for CWD with negative results.

All but two of the infected captive herds found in the United States have been depopulated. One Nebraska herd was quarantined, monitored for additional cases of CWD, and released from quarantine after no more cases were found in 3 years. The Oklahoma herd has not been depopulated despite the recognition of infected elk in 1998, but it recently was appraised in preparation for euthanasia, testing, and disposal of the animals. As is the case with the Oklahoma herd, there are other situations where there was an extended delay between the diagnosis of CWD and herd depopulation. In several instances this delay occurred while arrangements were made with state and federal animal health authorities for compensation of the owner.

Indemnification for captive elk destroyed in CWD control efforts is one component of the proposed program currently being developed by USDA's Animal and Plant Health Inspection Service (APHIS). The APHIS program, which was requested by the commercial elk industry, is being put together with their assistance as well as with input from animal health officials, wildlife management agencies, and other organizations. Drafts of the proposed program have been informally reviewed, and a formal document is being prepared for publication in the Federal Register. The major components of the program are indemnification for elk destroyed in CWD-control efforts, a monitoring and certification program for captive elk herds, and for herd plan guidelines for positive facilities. The programs as currently proposed would be voluntary unless interstate shipment of animals is involved and will apply only to captive elk with no provisions for other cervid species.

In September 2001, the USDA issued a declaration of emergency regarding CWD, and approximately $2.6 million were made available in Commodity Credit Corporation (CCC) funds for indemnification and surveillance. In February 2002, an Interim Rule was published in the Federal Register regarding CWD indemnification and another $12.2 million in CCC funds were released to support CWD control efforts. In addition to compensating owners for the destruction of positive or exposed cervids, the USDA recently purchased approximately 1,350 elk in the northeastern portion of Colorado where CWD is endemic in wild deer and elk. Owners of nearly all of the captive elk herds in the endemic area participated in this buyout and agreed to never restock their property with cervids because of the continued disease risk. There will be no new captive cervid facilities constructed in Colorado's endemic area. Requests for similar federal assistance are expected from other states that recently have found CWD in wild animals.

Individual states may implement more stringent regulations than are outlined in the proposed federal CWD control program. In response to the identification of CWD in captive and wild cervids in several locations, numerous states recently have imposed bans or stringent regulations on live cervid movement. In some states, these regulations apply to animals originating from areas where CWD has been detected, while in others there is total prohibition of live cervid importation. Additionally, some states now require mandatory CWD surveillance of captive deer and elk. (Prepared by John Fischer)

Additional sources of information:

Canadian Food Inspection Agency (www.inspection.gc.ca)

USDA's Animal and Plant Health Inspection Service (www.aphis.usda.gov)

CWD in Wild Deer and Elk

In recent years, wildlife agencies in numerous states and Canadian provinces have worked diligently to identify the distribution and prevalence of CWD in wild deer and elk. This surveillance has resulted in the discovery of several new foci of CWD among wild cervids since 2000. This report summarizes the circumstances of occurrence and detection of CWD in wild deer and elk as of late May 2002.

Endemic area in Colorado, Wyoming, and Nebraska: In 1981, CWD was diagnosed for the first time in clinically ill free-ranging elk in northeastern Colorado. Later, clinically affected wild elk were found in adjacent southeastern Wyoming. By 1990, wild mule deer and white-tailed deer with CWD had been found in the same regions of both states. Initially, the detection of CWD in these two states resulted from submission of clinically affected animals for diagnosis. Additionally, active surveillance programs conducted by the Colorado Division of Wildlife and the Wyoming Game and Fish Department were developed in which hunter-killed, road-killed, or culled deer and elk were tested for CWD. This combination of targeted and active surveillance provided the information that allowed delineation of the CWD-endemic focus within Colorado and Wyoming. During 2000, active surveillance of hunter-killed deer in the adjacent southwestern corner of Nebraska disclosed an infected mule deer in Kimball County. Further active surveillance in 2001 has disclosed two additional infected deer in Kimball County and one in Cheyenne County. In early 2002, the Nebraska Game and Parks Commission (NGPC) announced that a clinically affected deer had tested positive for CWD in Scotts Bluff County, two counties to the north of Kimball County on Nebraska's western border. Prevalence of infection in the Colorado and Wyoming portions of this endemic focus has been estimated at less than 1% for elk, about 5% for mule deer, and about 2% for white-tailed deer. Local prevalence varied widely, however, and some subpopulations of mule deer had prevalences of 15%.

Saskatchewan: In Saskatchewan, CWD first was detected in 2000 in a mule deer killed by a hunter near the Alberta border. This animal was tested as part of active surveillance of approximately 1,400 hunter-harvested deer and elk following confirmation of CWD in more than 30 captive elk herds in Saskatchewan. Subsequent active surveillance conducted by Saskatchewan Environment and Resource Management personnel disclosed a second positive mule deer within the same general area. Although the source of infection in these wild animals is unknown, it is regarded as a possible spillover from infected farmed elk. Herd reduction efforts are underway in an effort to control the spread of CWD in wild cervids. Active province-wide surveillance of more than 4,000 hunter-killed wild deer and elk in the fall of 2001 yielded uniformly negative results.

Northwestern Nebraska: In 2001, active surveillance in the vicinity of a CWD-positive captive elk herd in Sioux County disclosed several infected white-tailed deer. On the ranch with the positive elk, a CWD infection rate of approximately 50% was found among 179 wild deer inside a high fence enclosure built on the property at the time the elk enclosure was constructed in the early 1990s. Among the positive deer were four fawns approximately 8-months old. Within a radius of 5 miles surrounding the property, 7 of 103 deer (6.8%) were CWD positive, and this prevalence dropped to 3.5% among 57 deer tested in the zone between 5 and 10 miles from the property. Of 125 deer tested between 10 and 20 miles from the facility, a single positive animal was found at a distance of 11 miles. The Nebraska Game and Parks Commission (NGPC) continues to monitor this focus of infection and has implemented an aggressive disease management plan to prevent the spread of CWD throughout the state's wild deer.

Southwestern South Dakota: The South Dakota Department of Game, Fish, and Parks began active surveillance for CWD after several positive captive elk herds were identified in 1997-1998. In 1998, a single positive white-tailed deer was found among 30 formerly wild deer that had been enclosed within one of the private elk facilities. From 1997-1999, positive free-ranging animals were not detected among approximately 1,000 deer and elk tested throughout the state. Sampling did not occur in 2000; however, 1 positive deer was found among approximately 500 hunter-killed deer and elk tested in 2001. The positive animal was from Fall River County in southwestern South Dakota near the Nebraska border. The animal was harvested in the area where CWD previously had occurred in captive elk herds as well as within 50 miles of the northwestern Nebraska captive elk facility where CWD had been diagnosed in captive and wild cervids. Active surveillance has been conducted in the vicinity where the positive South Dakota deer was found as well as in the intervening area between this location and the affected area in northwestern Nebraska. To date, additional positive animals have not been found.

Western Slope of Colorado: In March 2002 the Colorado Division of Wildlife (CDOW) announced it had confirmed CWD infection for the first time in mule deer west of the continental divide in Routt County, Colorado. In accordance with CDOW policy, wild deer and elk that had been inadvertently confined with captive-bred elk in a facility constructed in the summer of 2001 were destroyed in order to prevent them from escaping back into the wild. Two deer of 340 entrapped wild deer and elk killed in the enclosure tested positive for CWD. From April 1-3, 2002, personnel from CDOW and USDA-APHIS' Wildlife Services collected 308 wild deer within a 5-mile radius outside the private facility. Two deer collected during this operation tested positive for CWD, and 1 more infected deer was found among 18 deer subsequently killed in the same immediate area. Beginning April 15, 2002, an additional 135 elk and 285 deer were killed within 5 miles of the private enclosure in an aggressive attempt to kill as many wild deer and elk as possible before the animals began seasonal migration out of the area. This task was carried out by CDOW and Wildlife Services personnel, assisted by volunteers from the Mule Deer Association, Rocky Mountain Elk Foundation, Traditional Bowhunters Association, Colorado Outfitters Association, and Colorado Bowhunters Association. None of the elk tested positive, but three more positive deer were identified. This brings the total number of positive deer outside the facility to 6 of 633 killed and tested, indicating a prevalence of less than 1% in the wild deer in the area. The source of this focus has yet to be determined. Since 1996, CDOW has tested more than 2,000 animals throughout the non-endemic portion of the state for CWD, including animals from each of the large mule deer herds on the Western Slope. None has been infected, with the exception of the recent Routt County outbreak.

Wisconsin: The Wisconsin Department of Natural Resources (DNR) began active surveillance of hunter-killed white-tailed deer in 1999 and through the 2001 hunting season had sampled more than 1,000 deer. On February 28, 2002, it was announced that three deer, all harvested within 2 miles of each other in Deer Management Unit (DMU) 70A in Dane County in 2001, were CWD positive by immunohistochemistry assay of brain stem. One deer was emaciated and lethargic when shot by the hunter. Subsequent collection and testing of 516 deer within a 5-mile radius centered around the positive animals disclosed an additional 15 (2.9%) infected animals during March-April 2002. The origin of this focus of CWD is not yet clear, but the absence of any positive deer in other DMUs argues against the concept of a long-term, naturally occurring enzootic presence in the state. In response to this crisis, the Wisconsin DNR currently is developing and implementing an aggressive disease management program to kill as many deer as possible within a 328-square-mile area. In one component of the program, landowners will be authorized to shoot deer on their

property in the "Chronic Wasting Disease Eradication Zone" for 1 week per month during June, July, August, and September. Thousands of wild whitetails are targeted for depopulation in this effort to prevent CWD's spread throughout Wisconsin's deer herd. (Prepared by Randy Davidson)

Additional sources of information:

Colorado Department of Wildlife (www.wildife.state.co.us)

Nebraska Game and Parks Department (www.ngpc.state.ne.us/wildlife/cwd/cwdinfo.html)

Saskatchewan Environment and Resource Management (www.serm.gov.sk.ca)

South Dakota Game, Fish and Parks (www.state.sd.us/gfp/)

Wisconsin Department of Natural Resources (www.dnr.state.wi.us)

Wyoming Game and Fish (gf.state.wy.us)

Public Health Concerns About CWD

There currently is no convincing evidence that the agent of chronic wasting disease (CWD) affects humans. However, public health officials recommend that human exposure to the CWD agent be avoided as they continue to evaluate any potential risk. Contrary to a story that circulated in the popular press, an investigation by the Centers for Disease Control and Prevention (CDC) did not find a link between CWD and Creutzfeldt-Jakob Disease (CJD) in three persons, aged 28-30 years, who consumed venison. The investigators concluded: "Although the occurrence of 3 unusually young patients with CJD who consumed venison suggested a possible relationship with CWD, our follow-up investigation found no strong evidence for a causal link. Ongoing CJD surveillance remains important for continuing to assess the risk, if any, of CWD transmission to humans."

The tendency toward a natural "species barrier" reducing human susceptibility to CWD and other prion diseases has been demonstrated by *in vitro* studies. However, lingering uncertainty about any potential risk that CWD may pose to humans is fostered by differing experiences with two more common animal TSEs. Although there is a long history of human exposure to scrapie through handling and consuming sheep tissues, including brain, there is no evidence that scrapie presents a risk to human health. In contrast, massive exposure of British and perhaps other European citizens to the BSE agent has resulted in approximately 130 human cases of variant CJD as of April 2002. In 2000, the World Health Organization (WHO) published the proceedings of the *WHO Consultation on Public Health and Animal Transmissible Spongiform Encephalopathies: Epidemiology, Risk and Research Requirement*. The consultants consisted of researchers from around the world who are experts on human and animal spongiform encephalopathies. The consultants summarized their findings with the statement: "There currently is no evidence that Chronic Wasting Disease in Cervidae is transmitted to humans."

This situation has not changed. Despite the lack of a causal link between CWD in deer and elk and CJD in humans, the WHO Consultation made the following recommendations regarding CWD: Authorities should encourage awareness and surveillance for CWD around the world; no part or product of any animals with evidence of CWD or other TSEs should be fed to humans or any species of domestic or captive animal; work should continue to improve the understanding of CWD; and precaution should be taken to prevent introduction and spread of CWD when translocating wild or domestic cervids.

Similarly, public health and wildlife management professionals encourage hunters, meat processors, and taxidermists to take some common sense measures to prevent potential

exposure to the CWD agent and to other known zoonotic pathogens. For example, the Colorado Division of Wildlife recommends the following precautions for hunters in the CWD endemic area: Do not shoot, handle or consume any animal that appears sick; contact the Division of Wildlife if you see or harvest an animal that appears sick.

- Wear rubber gloves when field dressing carcasses.
- Bone out the meat from your animal.
- Minimize the handling of brain and spinal tissues.
- Wash hands and instruments thoroughly after field dressing is completed.
- Avoid consuming brain, spinal cord, eyes, spleen, tonsils, and lymph nodes of harvested animals.
- Avoid consuming the meat from any animal that tests positive for the disease.
- Request that your animal be processed individually, without meat from other animals being added to meat from your animal.

(Prepared by John Fischer)

Additional Sources of Information:

Belay, Ermias D. et al. 2001. Creutzfeldt-Jakob Disease in unusually young patients who consumed venison. *Archives of Neurology* 58:1673-1678.

Williams, Elizabeth S., Michael W. Miller, and E. Tom Thome. Chronic Wasting Disease: Implications and Challenges for Wildlife Managers. *Transactions of the 67th North American Wildlife and Natural Resources Conference*. In Press.

Centers for Disease Control and Prevention (www.cdc.gov)

Colorado Division of Wildlife (www.wildlife.state.co.us)

World Health Organization (www.who.int)

Mailing List Update

If you are receiving the SCWDS BRIEFS through forwarding from an old address or you are reading someone else's copy and want to receive your own, please let us know. Also, if you know someone else who would appreciate receiving the BRIEFS, have them notify us. You can send the information to *dwood@vet.uga.edu* or fill out the form below.

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CITY, STATE, ZIP_____

MAIL TO:

Gary Doster

Southeastern Cooperative Wildlife Disease Study

College of Veterinary Medicine

University of Georgia

Athens, GA 30602

* *

Information presented in this Newsletter is not intended for citation in scientific literature. Please contact the Southeastern Cooperative Wildlife Disease Study if citable information is needed.

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Recent back issues of *SCWDS BRIEFS* can be accessed on the Internet at SCWDS.org.

Northeast Section

The Wildlife Society

Memorandum

To: Northeast Fish and Wildlife Directors, Northeast Wildlife Administrators, TWS
From: Robert A. Inslerman, President,
Subject: Northeast Section of the Wildlife Society Resolution on Chronic Wasting Disease

Date: June _____, 2002

Whereas; The Northeast Section of the Wildlife Society, is a scientific and educational organization comprised of professional wildlife biologists from the northeastern states and eastern Canadian provinces, and;

Whereas; The Mission of the Northeast Section of the Wildlife Society is to foster excellence in wildlife stewardship through science and education among wildlife professionals within the northeastern United States and eastern Canada, and;

Whereas; Chronic Wasting Disease (CWD) is a fatal transmissible disease that is closely associated with the same group of diseases commonly known as Mad Cow disease, for which there is no available treatment or vaccine to prevent infection, and;

Whereas; CWD can be spread by close contact between animals, between animals exposed to a CWD-contaminated environment, and between captive and wild free-ranging cervids, and;

Whereas; CWD was long thought to be endemic to specific regions of Colorado and Wyoming, CWD has now been identified in a number of other western states and Canadian provinces, more recently, east of the Mississippi River in Wisconsin and now New Mexico, and;

Whereas; There are limited options for controlling CWD, and;

Whereas; The Northeast Fish and Wildlife agencies are responsible for managing white-tailed deer, an important and valuable public trust resource, and;

Whereas; The Northeast Association of Fish and Wildlife Agency Directors recognize the importance of preventing the spread of CWD into the northeast, therefore be it

Resolved; That the Northeast Section of the Wildlife Society fully supports and endorses the Northeast Association of Fish and Wildlife Agency Director's resolution that the thirteen northeastern states endorse an immediate moratorium on the importation of all live cervids into any northeastern state.

Robert A. Inslerman

c/o NYSDEC - Bureau of Wildlife
Route 86 PO Box 296
Ray Brook, NY 12977

Resolution of the Northeast Association of Fish and Wildlife Agency Directors relative to the threat of Chronic Wasting Disease to native, free-ranging white-tailed deer,

WHEREAS:

1) Chronic wasting disease (CWD) is known to occur in seven western states, two Canadian provinces and has recently been documented as far east as Wisconsin,
2) White-tailed deer are an important and valuable wildlife resource held in public trust by various state governments,
3) CWD is a fatal Transmissible Spongiform Encephalopathy (disease of the central nervous system) affecting the family Cervidae,
4) CWD can only be tested by examining the brain tissue of dead animals,
5) CWD has a poorly understood transmission and incubation period,
6) CWD can be passed between captive and wild, free-ranging cervids,
7) Cervid farming has become an increasingly popular alternative livestock practice, and
8) CWD has the potential to devastate native, wild white-tailed deer populations,

BE IT RESOLVED THAT the thirteen states endorse an immediate moratorium on the importation of all live cervids into any northeastern state.

Report on Inspections of Cervid Facilities Under Game Farm Licenses by Law Enforcement and Wildlife Resources Sections

Prepared By
Richard L. Hall

Wildlife Resources Section
August 30, 2002

Background: West Virginia has provided for the licensing of private game farms (Chapter 20-2-47 Code of West Virginia) since the early 1930's. The private game farm license allowed the individual operator to propagate wild animals and wild birds for commercial purposes - breed, raise, sell - in accordance with rules prescribed by the Director of the West Virginia Conservation Commission (Division of Natural Resources). When this license was established, populations of quail, deer, etc. were few in numbers and private game farms provided pen reared animals for restocking and shooting preserves. Today, a few of the larger game farm facilities are currently directing their efforts towards breeding for larger antler development and selling or trading stock for genetic benefits.

On October 11, 2001, the Director of the Division of Natural Resources issued a directive for the Law Enforcement and Wildlife Resources Sections to update the forms used for monitoring game farm facilities and to inspect all facilities where captive cervids are held under a game farm license. This report provides a summary of findings.

Inspection Responsibility: The inspection of all game farm licensed facilities, in which captive cervids were a component, was conducted by law enforcement and wildlife personnel between the period July 29 thru August 22, 2002.

Number of Cervid Facilities Inspected: A total of 54 game farm facilities was inspected. Of the 54 inspected, 41 (76%) facilities reported records were current. Nine of the 13 (24%) facilities that were delinquent were in violation of state law. Poor record keeping or no business license was the major offense. Delinquent facilities were warned and advised of improvements needed in maintaining adequate records.

Primary Purpose of Cervid Facilities: By far, keeping cervids as pets was the primary purpose for having captive cervids. Thirty-two (59%) facilities reported pets as their main interest. Twenty facilities reported breeder stock as their primary purpose and 18 facilities reported sale to shooting preserves. Several facilities reported keeping cervids for a combination of breeder, pets, and shooting preserves. A few facilities maintain cervids for public viewing, exhibit, and the sale of meat (red deer and red elk).

Distribution and Year Cervid Facilities Came into Existence: Twenty-three (42%) of West Virginia's 55 counties have game farm operations. District 2 has 25 facilities in 6 counties while District 1 has 16 facilities in 7 counties. The remaining districts are fairly evenly divided in the number of facilities. With the exception of Oglebay Zoo which housed imported deer in 1977, the oldest licensed game farm that stocked whitetails, fallow, and elk was started in 1984. Twenty-seven (49%) of all facilities housing whitetails were licensed in the past 5 years. Forty-five (82%) were licensed in the past 10 years.

Cervid Pen Size: Data from law enforcement's license and inspection checklist indicated that fifty-three (98%) of the facilities had adequate pen sizes for holding whitetail deer, elk, and/or fallow deer. Pen sizes ranged from a low of 1/10th of an acre to 939 acres. Thirty-three (61%) of the facilities indicated that the penned deer and/or elk could make direct contact with other cervids outside the fenced area. Seven (13%) facilities reported 17 deer escaping into the wild during the

past 5 years.

Number of Cervids in Pens: A total of 1,009 whitetail deer, 66 elk, 55 fallow deer, and 54 red deer/red elk are under fence in West Virginia. The number of whitetail deer in pens ranged from 1 to 209. Fifty-one (94%) of the 54 game farms inspected had whitetail deer in pens. Only five facilities housed elk. Since fallow deer are not native to the state and therefore not covered under Chapter 20 or DNR Administrative Rules, only those fallow deer listed on the game farm license were included in the inspection report.

Sick or Dead Cervids: During the inspection, licensees were asked if during the past 5 years any deer became sick or died. Sixteen (29%) pen owners reported having sick deer and 20 (37%) pen owners reported mortality in penned deer. Several owners had the sick or dead deer checked by a veterinarian. In most cases, dead deer were disposed of by burying on the property.

Sale of Cervids: Twenty-two (41%) of the licensees sold cervids to other game farm operators. It appears that most of the transactions were within the state of West Virginia. Data was not collected on cervids imported into West Virginia; however, importation records maintained by the Wildlife Resources Section indicates that the 16 deer imported into West Virginia between 1997 and 2001 came from the States of Ohio and Pennsylvania. These imported deer were permitted only after the facilities verified that the entire deer herd was TB free and met WV Dept. of Agriculture and DNR's rules for importation.

Average Income from Cervid Facilities: Thirty (56%) facilities reported zero income and 17 (31%) reported less than $4,000 income from their operations. Seven of the remaining 8 facilities reported between $5,000- $20,000 and one facility reported $200,000 in income.

Summary: Based on the data supported by the inspection of the 54 game farm facilities having captive whitetail deer and elk under high-fence, the majority of the facilities are small operations generating little to no income for the operator. Many of these facilities have only recently been actively acquiring whitetail deer and possess small numbers of deer for pet purposes. Although nearly all facilities meet the minimum pen size requirements, several have a lot to be desired from a public perspective. Fences are not constructed to prevent direct contact with cervids outside the facility, thus allowing for the potential transmission of disease. Past record keeping was very poor; however, with the advent of the new record forms, improvements should be forthcoming. Since nearly half the licensees sell cervids, the potential for transfer of disease is ever present.

Recommendations: With the recent awareness and potential for Chronic Wasting Disease (CWD) to spread from captive cervids to wild cervids, it is recommended that administrative rules be enacted to prohibit the transfer and sale of cervids within the state and the importation of cervids into the state. This recommendation is supported by 26 states that have banned all cervid imports and 22 states that prohibit the importation of cervids from any county, region, and/or state that is endemic for CWD. It is further recommended that no future game farm licenses be issued for captive cervids and those facilities currently in existence be grandfathered and allowed to exist but not be allowed to expand, sell, or transfer captive cervids or the facility to another person under the game farm provision in Chapter 20-2-47. Furthermore, it is recommended that modifications be made to

Legislative Rule Title 58, Series 63 "Commercial Sale of Wildlife" requiring existing captive cervids be marked with a unique identification number for monitoring purposes and to protect public health and the welfare of native wildlife.