

Commonwealth of Pennsylvania



Photo courtesy of PGC

Chronic Wasting Disease Response Plan July 2011

Executive Summary

Chronic Wasting Disease (CWD) is one of a group of diseases called Transmissible Spongiform Encephalopathies (TSEs), or prion diseases. These diseases are believed to be the result of an infectious, self-propagating prion protein whose shape can be transformed to cause disease. CWD is closely related to, but different than, other TSEs, including Scrapie in sheep, Bovine Spongiform Encephalopathy in cattle, and Creutzfeldt-Jakob Disease and variant Creutzfeldt-Jakob Disease in humans.

The white-tailed deer is the state mammal and a valued natural resource. Pennsylvania's nearly one million deer hunters play a valuable role in society by managing deer populations through regulated deer harvest. An important incentive for hunters is the food provided by venison. Hunters prefer to harvest healthy animals. A deer herd with CWD may not be attractive to hunters, and may jeopardize the Pennsylvania Game Commission's (PGC) ability to manage deer populations. According to research conducted by the Center for Rural Pennsylvania, deer hunting and other related activities are the foundation of an industry that adds billions of dollars to the Commonwealth's economy annually.

Pennsylvania has the second largest domestic cervid industry in the country. There are over 1,000 domestic cervid breeding farms, hobby farms, and shooting preserves in the Commonwealth. Inter- and intrastate movement of these domestic cervids is a significant risk factor that relates to the introduction and amplification of this disease.

An Inter-Agency CWD Task Force was formed in 2003 to develop a strategic program for the prevention and early detection of CWD in free-ranging and domestic cervids. Members of the Inter-Agency CWD Task Force represent the PGC, the Pennsylvania Department of Agriculture, the state Department of Environmental Protection, the state Department of Health, and the U.S. Department of Agriculture. The Inter-Agency CWD Task Force communicates with other officials throughout the United States. A separate stakeholders CWD task force, representing industry and sportsmen's groups affected by CWD response plan activities, was formed to provide input to this response plan.

The need for revisions of the response plan is addressed annually. In the 2011 revision, minor changes were made through the document incorporating the latest scientific information. Significant changes were made to Appendix D: CWD Response Plan for Cervids considering the expanding epizootic from West Virginia into Maryland and Virginia. One change includes the usage of a Disease Management Area (DMA) in place of surveillance zones and containment zones. DMAs will be using the same concepts but will be easier to implement and provide greater flexibility to involved agencies. Also, additional actions are now possible if CWD is identified within 10 miles of the Commonwealth's border.

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Definitions

Active surveillance- Sampling of healthy cervids from either hunter killed, road killed, or those killed because of crop damage

Alkaline digester- Method of carcass disposal based on alkaline hydrolysis using sodium or potassium hydroxide under pressure and at elevated temperatures of approximately 150°C. This process turns prions into peptides and amino acids thus disrupting the abnormal shape.

Amplification risk factors- Those factors that increase the likelihood that the prevalence of CWD will increase once it is present

Animal health official- A full time employee of the state animal health department or of APHIS who has authority from the State Veterinarian or the AVIC to carry out authorized activities.

Approved laboratory- A private, State, Federal, or university laboratory that has passed an annual proficiency test for CWD disease testing. All CWD testing must be done in a laboratory approved by NVSL. PADLS is an approved laboratory for CWD testing at the Pennsylvania Veterinary Laboratory in Harrisburg and the New Bolton Center in Kennett Square.

Cervids- All members of the Family Cervidae and hybrids

Chronic Wasting Disease (CWD)- The Transmissible Spongiform Encephalopathy (TSE) of cervids

Composting- Controlled aerobic biological decomposition of moist organic solid matter; an optional disposal method of cervid carcasses.

CWD response plan- The management document derived from the Inter-Agency CWD Task Force that describes the coordinated response to a CWD outbreak.

Designated CWD Epidemiologist- A veterinarian with the knowledge and ability to perform the functions required of the CWD Uniform Methods and Rules as established by USDA-APHIS-VS.

Disease Management Area (DMA)- The geographic area of Pennsylvania influenced by a positive case of CWD. It is in this area that related CWD management activities will take place.

Domestic cervids- Privately owned members of the Family Cervidae within a perimeter fence or confined area.

Endemic equilibrium- The balance of the presence of a disease in a population

Environmental characteristics- Barriers, rivers or other natural features to channel or inhibit movement of free-ranging cervids.

Enzyme-Linked Immunosorbent Assay (ELISA)- A screening test used to detect the presence of antibodies or antigen in a sample. In terms of CWD testing, all non-negative results must be confirmed by an immunohistochemistry (IHC) test.

Exposure risk factors- Those factors that increase the likelihood that CWD prions will infect cervids in Pennsylvania.

Family Cervidae- Mammal species with antlers, also known as cervids

Free-ranging cervids- Members of the Family Cervidae that are not confined but are considered wild, as opposed to domestic cervids.

Herd- One or more animals that are (a) under common ownership or supervision and are grouped on one or more parts of any single premises (lot, farm, or ranch); or (b) all animals under common ownership or supervision on two or more premises which are geographically separated but on which animals have been interchanged or had direct or indirect contact with one another; or (c) the free-ranging cervids owned (held in public trust) by the citizens of the Commonwealth.

Herd Certification Program (HCP)- A program of surveillance and related actions designed to determine the CWD status of domestic cervid herds. Herds that successfully complete five years of the program will be designated as Certified.

Herd Monitored Program (HMP)- Those domestic cervid herds that do not meet the requirements of the Herd Certification Program

High risk material- Specific carcass parts that are more likely to carry the CWD prion including brain, tonsils, eyes, lymph nodes, spinal cord/ backbone, spleen, brain tanned hides, or any object containing visible brain, spinal cord, or large peripheral nerve material.

Immunohistochemistry- Microscopic localization of specific antigen in tissues by staining with antibodies labeled with fluorescent or pigmented material; or a laboratory test performed to identify prions and other infectious agents.

Indemnity- Monetary reimbursement of valuable animals and other goods according to state or federal guidelines.

Inter-Agency CWD Task Force- Members include the Pennsylvania Department of Agriculture, Game Commission, Department of Health, Department of Environmental Protection, and USDA-APHIS-Veterinary Services and Wildlife Services.

Intrastate- Movement of animals or by-products within the Commonwealth

Landfill- A location to dispose of carcasses by sanitary techniques of burial

Leachate- A by-product from the landfill process that may have contaminants from the materials that it passes through.

National Veterinary Services Laboratories (NVSL)- The USDA-APHIS-VS laboratory responsible for confirmation of CWD positive tissues located in Ames, Iowa.

Pennsylvania Animal Diagnostic Laboratory System (PADLS)- Three laboratories in the Commonwealth that provide diagnostic services to the animal industries.

Pennsylvania Department of Agriculture (PDA)- The Commonwealth agency responsible for regulating domestic cervids.

Pennsylvania Game Commission (PGC)- The Commonwealth agency responsible for protecting and managing free-ranging cervids.

Prevalence- Number of cervids affected with CWD at a specific time as a percent of those that are susceptible to the disease (the at-risk population).

Prion- Normal proteins whose shape can be transformed to cause disease.

Quarantine- A period of time during which a vehicle, animal, or material suspected of carrying a contagious disease is detained under enforced isolation to prevent spread of disease.

Rehabilitators- Persons licensed by the PGC who help restore animals to health for potential return to their habitat.

Rendering- A method of disposal of cervid carcasses that are not positive for or exposed to CWD positive animals or CWD contaminated environments.

Ruminant- Animals that have a stomach with four compartments and chew cud; examples include cattle, sheep, goats, and cervids.

Somnolence- The state of being drowsy or sleepy; one of the clinical signs of CWD

Stakeholders CWD task force- A working group including the Inter-Agency CWD Task Force, meat processing industry, domestic cervid industry, taxidermy associations, and sportsmen's groups affected by CWD response plan activities.

Surveillance- Activities related to the detection of a disease.

Susceptible species- All animals in the genera *Odocoileus*, *Cervus*, and *Alces* and their hybrids.

Targeted surveillance- Sampling of cervids displaying clinical signs consistent with CWD.

Transmissible Spongiform Encephalopathy (TSE)- Syndromes believed to be caused by misfolded prions in the brain. Examples include Scrapie in sheep and goats, CWD in cervids, Bovine Spongiform Encephalopathy (BSE) in cattle, and variant Creutzfeldt-Jakob Disease in humans.

United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services (USDA-APHIS-VS)- An agency of APHIS in charge of domesticated animal health activities within the United States. The mission of Veterinary Services (VS) is to protect and improve the health, quality, and marketability of our nation's animals, animal products and veterinary biologics by preventing, controlling and/or eliminating animal diseases, and monitoring and promoting animal health and productivity

United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (USDA-APHIS-WS)- An agency of APHIS to assist in wildlife health activities within the United States. The mission of Wildlife Services (WS) is to provide Federal leadership in managing problems caused by wildlife.

SCOPE AND PURPOSE

Chronic Wasting Disease (CWD) management actions in other states and provinces have failed to eliminate or halt the spread of CWD in free-ranging cervid populations. Therefore eradication is not considered a reasonable goal when responding to a CWD outbreak. The goal now is to determine the prevalence and distribution of the disease and work to contain it. Although there is currently no evidence that the spread of CWD can be stopped, efforts will be directed to control the disease to the smallest geographic area possible by mitigating existing disease risk factors.

The purpose of this plan is to describe Pennsylvania's intended response to the threat and mitigation in the event of a CWD outbreak in the Commonwealth. Pennsylvania's response will be a coordinated effort involving various state and federal agencies with associated stakeholders.

PLAN DEVELOPMENT AND MAINTENANCE

The need for revisions of the response plan will be addressed annually. The response plan is intended to provide guidance and should not be construed to be a legally binding document. In emergency situations, all agencies have the authority to be flexible with their management activities as new information becomes available.

An Inter-Agency CWD Task Force was formed to develop a strategic program for the prevention and early detection of CWD in free-ranging and domestic cervids. Members of the Inter-Agency CWD Task Force represent the PGC, the PDA, the state Department of Environmental Protection, the state Department of Health, and the U.S. Department of Agriculture. The Inter-Agency CWD Task Force communicates with other officials throughout the United States. A separate stakeholders CWD task force, representing industry and sportsmen's groups affected by CWD response plan activities, was formed to provide input to this response plan.

SITUATION AND ASSUMPTIONS

The white-tailed deer is the state mammal and a valued natural resource. Pennsylvania's nearly one million deer hunters play a valuable role in society by managing deer populations through regulated deer harvest. An important incentive for hunters is the food provided by venison. Hunters prefer to harvest healthy animals. A deer herd with CWD may not be attractive to hunters, and may jeopardize the PGC's ability to manage deer populations. According to research conducted by the Center for Rural Pennsylvania, deer hunting and other related activities are the foundation of an industry that adds billions of dollars to the Commonwealth's economy annually.

Pennsylvania has the second largest domestic cervid industry in the country. There are over 1,000 domestic cervid breeding farms, hobby farms, and shooting preserves in the Commonwealth. Inter- and intrastate movement of these domestic cervids is a significant risk factor that relates to the introduction and amplification of this disease.

CWD is one of a group of diseases called Transmissible Spongiform Encephalopathies (TSEs), or prion diseases. These diseases are believed to be the result of an infectious, self-propagating prion protein whose shape can be transformed to cause disease. CWD is closely related to, but different than, other TSEs, including Scrapie in sheep, Bovine Spongiform Encephalopathy in cattle, and Creutzfeldt-Jakob Disease and variant Creutzfeldt-Jakob Disease in humans.

In the Family Cervidae, or referred to hereafter as "cervids," CWD was first recognized as a disease in 1967 in captive mule deer at a wildlife research facility in Fort Collins, Colorado. To date, CWD has been diagnosed in Colorado, Illinois, Kansas, Maryland, Michigan, Minnesota, Missouri, Montana, Nebraska, New Mexico, New York, North Dakota, Oklahoma, South Dakota, Utah, Virginia, West Virginia, Wisconsin, Wyoming, and the Canadian provinces of Alberta and Saskatchewan (Appendix A). Current information can also be obtained from the following website: <http://www.cwd-info.org/>.

Various non-cervid species have been on CWD-infected premises and have not developed clinical disease. Experimentally, other species can be infected with CWD when challenged by dosages and routes that would not occur naturally, but the epidemiological significance of this is unknown. No case of human disease has been epidemiologically associated with CWD. However, as a precaution, the Centers for Disease Control and Prevention recommends people or other animals do not eat any part of a cervid diagnosed with CWD <http://www.cdc.gov/ncidod/dvrd/cwd/>.

Although CWD is clearly infectious among certain species of cervids, the actual mechanism(s) of transmission have not been determined. Experimental evidence has demonstrated transmission of CWD through direct animal-to-animal contact via saliva, feces, and urine. Maternal transmission may occur, but it appears to be relatively uncommon and unimportant in the maintenance of the disease in the wild.

Prion contaminated environments are very likely to play a significant role in the development and persistence of CWD epidemics. The CWD agent has been shown to persist in contaminated environments for years after all live cervids had been removed. Sources of contamination include saliva, urine, feces, and decomposing carcasses of infected animals. The direct binding of the CWD prions to soil enhances its infectivity and transmission is more likely to occur where cervids are exposed to greater numbers of infectious doses, such as when they are congregated at supplemental feed stations.

Susceptible species include elk, red deer, mule deer, black-tailed deer, white-tailed deer, sika deer, moose and hybrids of these. CWD appears to be maintained naturally in both domestic and free-ranging cervid populations. In free-ranging cervid populations, epidemiological models and results of cohort studies (Miller, et al, 2009) conclude that CWD will lead to local extinctions or to an endemic equilibrium.

In prion diseases, the incubation period appears to be dose-related. In cervids with natural CWD infections, the incubation period is generally 24-48 months from the time of infection to the time the animal shows obvious clinical signs. This incubation period may be shorter (16 months) or longer (60+ months) depending on the individual case. Infected animals can shed prions for up to 11 months before showing clinical signs of CWD. During the early stages of infection, animals may test negative due to the low level of prions present in the body tissues that are not detectable by laboratory tests that are currently available.

Clinical signs of CWD include weight loss, excessive salivation, increased drinking/urination, and abnormal behavior (e.g., stumbling, trembling, and depression). Infected cervids may also allow unusually close approach by humans or natural predators. Subtle changes in behavior (e.g., increased or decreased social interactions, repetitive movements, and periods of somnolence) may precede end-stage disease. Once signs appear, the course of CWD varies from a few weeks to more than a year, with most animals surviving several months before succumbing to complications related to CWD. Free-ranging cervids may not survive long once

signs begin because of increased vulnerability to predation, starvation, or trauma. CWD is inevitably fatal though affected animals may succumb to other diseases first. There is no known effective treatment or vaccine for CWD.

Other health problems, particularly pneumonia and injury, may appear outwardly similar to CWD. Consequently, laboratory diagnosis is required to confirm CWD infections in suspect animals. Definitive diagnosis must be made by testing of brain, lymph node, and/or tonsil tissue from a dead animal by immunohistochemistry (IHC). A rapid enzyme-linked immunosorbent assay (ELISA) test has been approved for screening purposes only. Currently, there is no practical live animal test for CWD. For current information on emerging CWD diagnostics, consult: http://www.aphis.usda.gov/animal_health/animal_diseases/cwd/ or <http://www.cwd-info.org/>.

RISK FACTORS

Risk factors are attributes of the environment or animals that are associated with a greater probability of CWD occurring in a target region or target population. Establishing the presence (or absence) of risk factors is fundamental for focusing attention and allocating resources in a response plan. Pennsylvania's risk factors include: large numbers of free-ranging cervids, large numbers of domestic cervids, areas artificially concentrated with cervids, movement of live or dead cervids from CWD infected areas, extensive legal and illegal feeding of cervids, and the fact that Pennsylvania borders three states with a history of CWD positives. See Appendix B for more discussion on risk factors.

PHASES OF RESPONSE PLANNING

There are four phases to effective response planning: prevention, preparation, response and recovery.

1) PREVENTION PHASE

The Inter-Agency CWD Task Force will implement a communication/education strategy intended to deliver to the public and agency employees the current information on CWD and the inherent risk it poses to Pennsylvania's cervids, both domestic and free-ranging (Appendix C).

Licensing, regulation and enforcement of the domestic cervid industry is under the authority of the PDA which has a CWD General Quarantine Order that outlines mandatory cervid herd programs.

PDA has established importation requirements for live cervids in consultation with PGC, USDA, and the domestic cervid industry. Currently, there is no prohibition against the importation of cervids from known CWD positive states in the Commonwealth. Importation requirements into the Commonwealth include participation in a recognized CWD herd certification program for at least three years if from a CWD-free state or province, and at least five years participation if from a state or province known to have CWD.

PGC has established importation prohibitions for high-risk cervid parts from either free-ranging or farmed sources to reduce the likelihood of CWD-contaminated materials ending up in the environment of free-ranging or domestic cervids.

Currently feeding of free-ranging elk is prohibited. PGC continues to educate elected officials and the public about the dangers of supplemental feeding of all free-ranging cervids.

USDA-APHIS-VS, PGC and PDA provide outreach to taxidermists, deer processors, sportsmen's groups, hunters, cervid producers, and landfill operators in Pennsylvania to share information regarding CWD, biosecurity, and proper waste disposal methods.

2) PREPARATION/EARLY DETECTION PHASE

Pennsylvania's preparation for a CWD outbreak includes maintenance of a current response plan, acquisition of necessary supplies and materials, developing laboratory and carcass disposal capabilities, keeping personnel trained and available for response as well as keeping the public informed about the disease and the associated activities of responsible agencies.

In the event a CWD incident occurs within the Commonwealth, PGC and PDA will serve as lead agencies and may include other state and federal agencies as needed.

The Inter-Agency CWD Task Force consisting of agency heads of PGC, PDA, USDA-APHIS-VS and WS, Pennsylvania Department of Health (PDH), and Department of Environmental Protection (DEP) will convene when CWD is confirmed in Pennsylvania by National Veterinary Services Laboratory (NVSL). The Inter-Agency CWD Task Force will educate Pennsylvania's citizens about the threat of CWD and prepare for and manage any CWD outbreak in Pennsylvania. The stakeholder's CWD task force, consisting of representatives from the meat processing industry, the domestic cervid industry, sportsmen's groups, and taxidermy association, will be apprised of the actions of the Inter-Agency CWD Task Force and will be encouraged to use tools provided by the task force agencies to educate and inform their memberships.

Early detection of CWD will require an ongoing surveillance strategy including both domestic and free-ranging cervids.

Surveillance Plan:

- A. Free-Ranging Cervids. The PGC, in cooperation with other agencies, will conduct surveillance (i.e. acquisition of specimens and testing of animals to determine the prevalence of disease) in free-ranging cervids. This surveillance will consist of two types, targeted and active. In both cases, collected specimens will be submitted to the closest Pennsylvania Animal Diagnostic Laboratory System (PADLS) laboratory (Appendix G), or other approved contract laboratory for testing. Testing will proceed as outlined in 2.b., below. Disposal of CWD positive specimens from targeted surveillance will be via incineration, alkaline digester, pre-composting coupled with incineration, or possibly landfill. The importance of obtaining and maintaining fresh specimens will be emphasized to maximize the effectiveness of diagnostic tests.
1. Targeted surveillance (Highest priority): This category calls for the continuation of current activities to identify and test free-ranging cervids statewide that have been observed by the public or agency staff with signs consistent with CWD (emaciation and central nervous system signs), or killed by vehicle collisions. These animals will be collected by PGC staff and submitted for testing at PADLS.
 2. Active surveillance: Under this strategy, representative samples of outwardly healthy cervids, harvested by hunters during normal hunting seasons or harvested under crop damage permits, will be collected and tested.

- a. In order to detect CWD in free-ranging cervids in Pennsylvania, active surveillance will; 1) test an annual sample of hunter-harvested deer and all hunter-harvested elk, 2) train necessary personnel in sample collection, extraction, and testing procedures, 3) increase public awareness and education concerning CWD surveillance activities, and 4) provide a platform for additional disease monitoring. PGC considers the sampling and testing of approximately 4,000 hunter-harvested deer to be reasonable and attainable depending on personnel and resources availability. Each Wildlife Management Unit (WMU) will be sampled in proportion to its contribution to the state's deer population as well as other risk factors such as proximity to positive cases. The heads of hunter-harvested deer will be collected by PGC deer aging teams from deer processing facilities, and transported to the nearest PGC regional office where trained personnel from various agencies will complete tissue extraction. Tissues from elk will be gathered at the elk check station, or in cooperation with the hunter's taxidermist.
- b. Testing procedures will consist of:
 - i. Specimen collection- Trained tissue extractors will remove the obex from the brain stem and medial retropharyngeal lymph nodes from the head.
 - ii. Data collection and analyses- Deer and elk age, sex, WMU, and hunter contact information will be recorded in a computerized database housed at the PGC. Hunters will be notified via phone and in writing if their deer/elk is positive for CWD. Test results will be compiled and analyzed using appropriate epidemiological and statistical methods, with results communicated as outlined in the Communications Plan (Appendix C).
 - iii. Testing- Tissues will be pooled for each animal, fixed in formalin, sectioned, and stained by IHC methods at an NVSL approved laboratory. Other scientifically validated methods may also be used as they become available. Suspect samples from cervids will be forwarded to NVSL for confirmation.

B. Domestic Cervid Herds. PDA has designated CWD as a dangerous transmissible disease as of July 2000, with mandatory reporting of suspect animals. Any cervid owner, veterinarian or diagnostic laboratory suspecting a case of CWD must report it to PDA immediately. PDA will coordinate surveillance on domestic herds.

PDA has mandatory programs for domestic cervids with additional information available at

http://www.portal.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_24476_10297_0_43/http%3B/10.41.0.36/AgWebsite/ProgramDetail.aspx?name=Chronic-Wasting-Disease-Program-&navid=12&parentnavid=0&palid=32&

1. CWD Herd Certification Program (HCP) is a five-year plan intended to achieve CWD Certified status for a herd. Requirements include annual herd inventories, annual inspections, official individual identification of live animals, fencing requirements and age-eligible post mortem testing.
2. CWD Herd Monitored Program (HMP) is a surveillance program for domestic cervid herds that do not meet the requirements of the HCP.

3) RESPONSE PHASE

Levels of Threat and Readiness

Level 2 – Heightened

Level 2 is achieved when an animal within 50 miles of Pennsylvania's border tests positive for CWD, or when an animal from Pennsylvania tests inconclusive for CWD and awaits confirmation by NVSL. Pennsylvania became a Response Phase Level 2 state in September 2005 when CWD was detected in West Virginia. As of November 2010, the closest known CWD positive animal in Maryland is now 10 miles from the Pennsylvania border. This is significant because a distance of 10 miles is expected to encompass the dispersal distance of 92-96% of yearling male deer.

Level 1 – Confirmed in a Free-ranging or Domestic Cervid Population

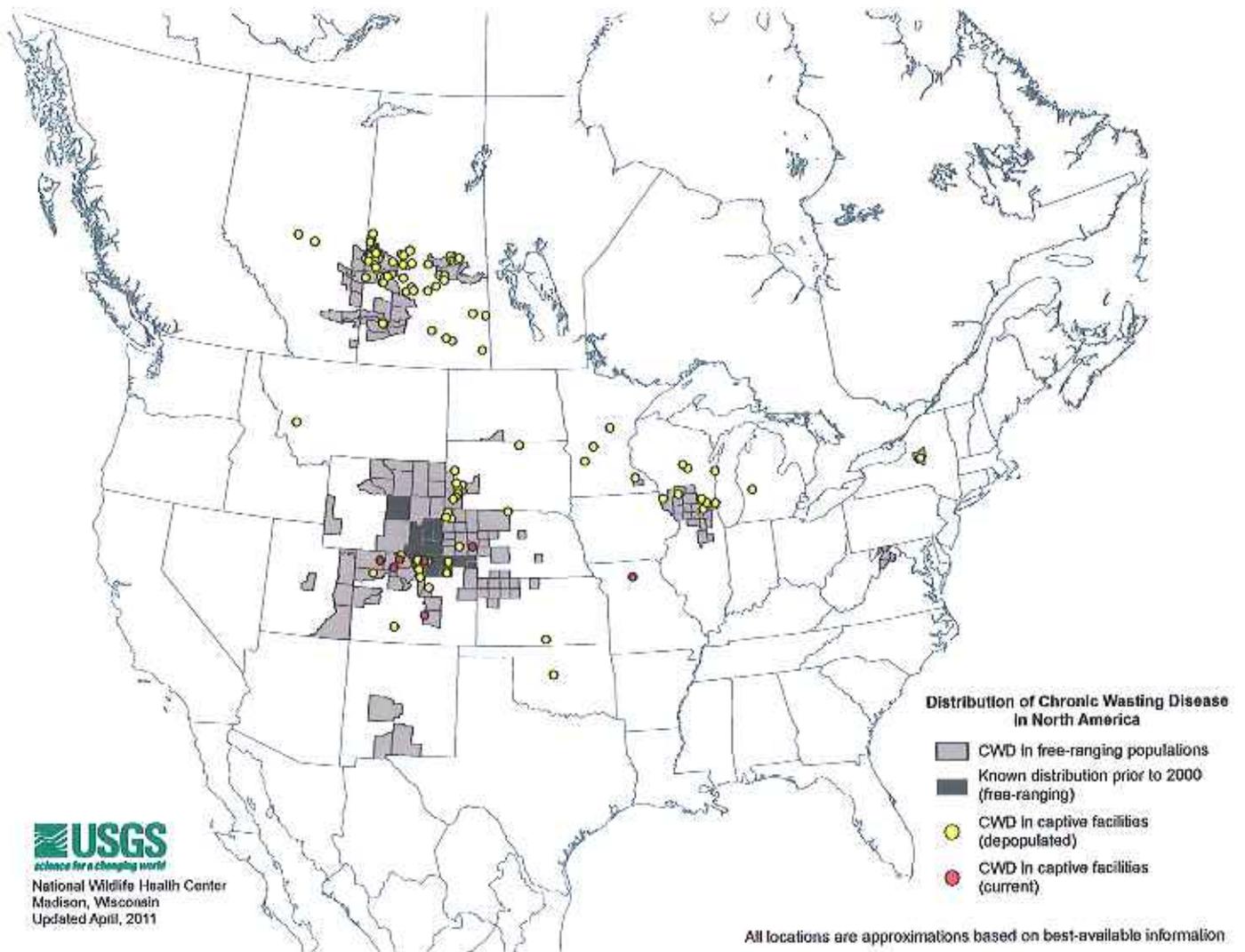
If CWD is confirmed in a free-ranging or a domestic cervid, the Inter-Agency CWD Task Force will convene and initiate appropriate actions as outlined in the Education/Outreach/Communication plan (Appendix C), the Response Plan (Appendix D) and the Carcass Disposal Plan (Appendix E).

The PGC and PDA will initiate steps to determine the prevalence and geographic distribution of the infection. Efforts to limit the spread of the disease may include free-ranging cervid population management and domestic cervid movement restrictions in affected areas. If it is determined that a reduction in the free-ranging cervid population is necessary, response actions may include removal of protection for deer and elk and/or altering existing hunting seasons and methods of taking. Strategies may include utilizing PGC and USDA-APHIS-WS personnel, as well as the services of private citizens/hunters.

4) RECOVERY PHASE

Recovery of free-ranging cervid populations after reduction in response to CWD detection may include adjusting hunting seasons, reducing bag limits, or methods of take. Restocking of contaminated domestic premises will be dictated by existing scientific data on the persistence of the disease agent in the environment.

Appendix A: Map of Chronic Wasting Disease in North America



From http://www.nwhc.usgs.gov/disease_information/chronic_wasting_disease/

Appendix B: Determining Risk Factors

Risk factors are attributes of the environment or animals that are associated with a greater probability of CWD occurring in a target region or population. Establishing the presence of risk factors is fundamental to focusing attention and resources. CWD is likely to occur at a low prevalence that is difficult to detect and not evenly distributed over the landscape. Current information suggests that CWD occurrence and prevalence can vary across geographic areas and occurs in disease clusters of affected animals. As a result, surveillance to detect CWD without reference to potential risk factors is likely to be inefficient. Increased understanding of risk factors over time will improve the efficiency of surveillance programs.

TABLE 1: Known or Suspected CWD Risk Factors

Exposure Risk Factors	Proximity to CWD-positive cases.
	Proximity to land that CWD-positive animals have lived
	Areas with high cervid population density
	Areas that have received cervids from CWD-affected regions
	Areas permitting transport of hunter-harvested cervid carcasses from CWD infected areas.
Amplification Risk Factors	Areas with high cervid population density
	Areas with a history of CWD animals or CWD contaminated environments
	Areas with a low abundance of large predators
	Areas where free-ranging cervids are artificially concentrated (baiting, feeding, water development, and other human related habitat modifications)

Adapted from: 2003. Surveillance Strategies for Detecting Chronic Wasting Disease in Free-Ranging Deer and Elk: Results of a CWD Surveillance Workshop. USGS-National Wildlife Health Center, Madison, WI. 40pp.

http://www.nwhc.usgs.gov/publications/fact_sheets/pdfs/cwd/CWD_Surveillance_Strategies.pdf

TABLE 1 above breaks down major CWD risk factors into two groups: one related to exposure (introduction of the disease into a new area or target population), and the other related to amplification (spread of disease within a susceptible population or region). As stated previously, the CWD agent is thought to be transmitted either by direct animal contact or indirectly through the environment. The risk of free-ranging animals being exposed to CWD is, therefore, greater in areas where CWD-positive animals have already been found or have contaminated the environment. Furthermore, human factors increase the exposure risk to uninfected free-ranging cervid populations. The movement of domestic cervids between premises, the animals' concentrated presence on such premises, and the possibility of their escape into the wild increases the risk of spreading CWD to uninfected populations of free-ranging animals. Since the infectious agent persists in the environment, locations from which CWD-positive animals have been removed will likely remain contaminated and the introduction of uninfected animals (either domestic or free-ranging) into that contaminated environment could increase the risk of infection.

Once disease occurs, the risk of amplification in a target population or location can increase depending on a number of additional factors. Disease risk will increase with higher density cervid populations, as well as the presence of habitat and other environmental characteristics that influence animal distribution, movements, and behavior. Baiting or artificial feeding

increases the concentration of animals in an area thereby increasing the chance of disease spread through direct contact between animals and indirect contact with a contaminated environment. Contaminated environments serve as a source of infection to animals for extended periods.

Evaluation of risk factors helps to focus resources toward targeted cervid populations with a greater likelihood of being infected and increases the efficiency of surveillance to specific locations. Surveillance on and around CWD positive cervid premises or premises that have received animals from known CWD areas, and along the borders with other jurisdictions with CWD positive animals can increase the effectiveness of surveillance efforts. Additional risk factors including the illegal feeding of ruminant-derived protein to cervids, baiting and artificial feeding programs, and environmental factors may also be considered. Understanding the distribution, movement, social behavior, population characteristics, and dynamics of affected cervid populations is essential to fully evaluate the risk factors for CWD in free-ranging populations.

Appendix C: Education/Outreach/Communications on Surveillance Activities

Appropriate agency officials will focus on ways to educate Pennsylvania residents about CWD and Pennsylvania's plans for CWD prevention, early detection, and response activities. All communicators should understand and be able to discuss basic facts about CWD, how it impacts wildlife, testing procedures, Pennsylvania's prevention and early detection efforts, and CWD management should the disease come to the Commonwealth. Communication and education activities should include:

1. Development of key messages about CWD for use in all communication efforts (presentations, print materials, etc) to provide accurate and consistent information about the disease.
2. Attendance by appropriate agency officials at meetings of respective constituency groups to make presentations and answer questions.
3. Attendance by appropriate agency officials at public meetings and special events to raise support and awareness about the state's surveillance efforts and prevention goals.
4. Raising public awareness and broad-based public support for preventive and management efforts through guest editorials in daily newspapers, radio and television interviews, and other public speaking opportunities.
5. Presentation of overview and updates regarding CWD to the Pennsylvania Legislature.
6. Survey of the public (hunters in particular) to determine: 1) their level of knowledge regarding CWD, 2) discover any knowledge gaps or misinformation about CWD, and 3) what their fears and concerns are regarding CWD and other wildlife health issues.
7. Preparation of CWD brochures and fact sheets for public distribution. Different brochures should be developed for specific target audiences and should be updated as necessary and include a date of development.
8. Publication of current CWD information in the *Pennsylvania Hunting and Trapping Digest*, and other relevant publications.
9. Frequent, up-to-date information should be posted on agency websites with a link to the CWD Alliance website at www.cwd-info.org. Include brochures and links to other agencies as well as a complete copy of this response plan.

Key Outcomes

- Enhancement of understanding among agency personnel and the public about the nature of prion diseases and associated risk factors.
- Prepare the public for the probability of a potential CWD infection.
- Maintain and increase public confidence in the agencies' capability and capacity to deal with free-ranging and domestic cervid health issues.
- Consistently and accurately communicate information about CWD and its impact on free-ranging and domestic cervids and human health.
- Maintain hunter participation at current levels.
- Establish a positive working relationship among state and federal agencies and stakeholders.
- Increase agency personnel and public awareness of wildlife health issues, particularly CWD.

Key Audiences

- Internal – agency personnel (which includes Inter-Agency CWD Task Force)
- Venison consumers – hunters, family members, people who dine at restaurants or attend wild game dinners, people who use soup kitchens, etc.
- Pennsylvania hunters traveling to other states, especially those states with a history of CWD
- Meat processors
- Road killed deer contractors
- Cervid farmers
- Farming industry (general)
- Radio, television and print media
- Legislature and legislative aides/liaisons
- General public
- Conservation organizations
- Rehabilitators
- Taxidermists
- Hunting industry organizations
- Landfills, incinerators, and deer rendering
- Zoos and menageries

Key Messages

- Susceptible species include elk, red deer, mule deer, black-tailed deer, white-tailed deer, sika deer, moose and hybrids of these.
- CWD belongs to a family of diseases known as Transmissible Spongiform Encephalopathies (TSE's). These diseases cause microscopic holes in brain tissues giving it a sponge-like appearance.
- There is no scientific evidence that CWD can infect humans or livestock through natural routes of infection.
- Pennsylvania and other Northeast state wildlife and animal health agencies are actively monitoring for CWD.
- Concerns over CWD should not prevent anyone from enjoying deer hunting and consuming meat from healthy animals. CWD has not been found in PA deer or elk,

but has been found in Maryland, New York, Virginia and West Virginia. Follow routine recommendations and take precautions as outlined on the PGC website when field dressing and handling wild game.

- The Inter-Agency CWD Task Force has developed a CWD Response Plan for Pennsylvania that outlines agency responsibilities and activities to prevent CWD from entering PA, to detect CWD as early as possible if it does arrive here, and to respond to the disease through reduction of risk factors.
- CWD prevention and control is being addressed at the international, national, regional and state levels.
- Any free-ranging deer or elk that appears to be sick or behaving abnormally should be immediately reported to the PGC. Sick or abnormally behaving domestic cervids should be reported to PDA.
- CWD testing is currently available for hunter-harvested cervids for a fee.

Education/Outreach/Communications on Response Activities

In the event of a CWD confirmation in or in close proximity to Pennsylvania, communication will play a critical role and be given a high priority. The response to the situation will have a lasting impact on public perception of the state's ability to address and control the disease. The Inter-Agency CWD Task Force will designate knowledgeable spokespeople to provide the most up-to-date information to the media, public, and other non-governmental entities.

Regardless of whether it is in a free-ranging or domestic cervid population, confirmation of a CWD positive cervid in Pennsylvania will involve the implementation of the response plan. Officials from the Inter-Agency CWD Task Force must outline a coordinated effort to address the situation, and maintain continual public communications to explain and update interested parties on actions and goals. Key communication activities include:

1. The appointed responsible person in PGC and PDA will be notified that a suspect sample from either a domestic or free-ranging cervid has been submitted to NVSL. Once NVSL has confirmed a CWD positive test result, the Inter-Agency CWD Task Force will be notified.
2. Notification to the specific hunter or cervid farmer of a CWD positive cervid will be made upon NVSL confirmation via phone and in writing.
3. Following confirmation of CWD, a meeting of key officials from agencies represented on the Inter-Agency CWD Task Force will be held in order to arrange a public announcement and the implementation of disease response strategies.
4. After the meeting of key officials, agency heads or designees will communicate with key constituency/ stakeholder groups, including counterparts in other Northeast states, appropriate federal agencies, legislators, local municipality officials where CWD is diagnosed, and university collaborators to inform them of the CWD confirmation and impending announcement.
5. A media advisory will be issued.
6. A public meeting will be held in the local area to discuss the CWD situation and planned activities to maximize public understanding and support for management activities.

7. In the days following the announcement, public interest (and media attention) will be at peak levels. The spokespeople for lead agencies will coordinate efforts to have agency heads or designees engaged in public appearances or interviews in television and radio programs, as well as ensuring their availability for print reporters and coordinating articles in stakeholder/trade publications to discuss the state's actions. Continual public communication will maximize achievement of the Key Outcomes listed above.
8. Each agency's press office will collect and analyze news stories to help determine the effectiveness of the communication and outreach efforts. Misinformation will be corrected and messages modified as needed,
9. The Department of Health will issue a human medical health advisory.
10. The Department of Agriculture will issue advisories to the veterinary community.
11. Stakeholders/sportsmen's groups will be encouraged to notify and educate their participants.
12. Periodically, public meetings may be held in the local area and across the state to provide updates on CWD activities and findings.

CHRONIC WASTING DISEASE TALKING POINTS

HISTORY:

CWD belongs to a family of diseases known as Transmissible Spongiform Encephalopathies (TSEs). These diseases cause microscopic holes in brain tissue giving it a sponge-like appearance. TSEs include such diseases as Scrapie in sheep, Bovine Spongiform Encephalopathy in cattle, and Creutzfeldt-Jakob Disease in humans. It is thought to be caused by an infectious deformed protein, called a prion, found in greatest concentrations in nervous and lymphatic tissues.

The mechanisms for transmission of CWD are not completely understood, but there is evidence that it is spread through body fluids, feces and contaminated environments. Testing cervids for CWD involves post mortem laboratory analysis of certain tissue samples. Live animal tests are currently being studied.

No treatment or vaccine is known for CWD. Once clinical signs develop the disease is always fatal in deer and elk. Infected cervids can appear robust and healthy in the early stages of CWD. Among cervids residing on premises with a history of CWD, most cases occur in 2-7 year old animals.

To date, there is no scientific evidence that CWD can be transmitted to either humans or livestock.

CWD will have a serious impact on the state's cervid populations, both free-ranging and domestic. Population declines would have a negative effect on wildlife viewing, hunting opportunities, and the domestic cervid industry.

An Inter-Agency CWD Task Force was formed to develop a strategic program for the prevention and early detection of CWD in deer and elk. Members of the Inter-Agency CWD Task Force represent the Pennsylvania Game Commission, the Department of Agriculture, the Department of Health, the Department of Environmental Protection, and the U.S. Department of Agriculture. The Inter-Agency CWD Task Force is also communicating with other officials throughout the United States. A stakeholders CWD task force representing industry and sportsmen's groups affected by CWD response plan activities was formed to provide input to the current version of the response plan.

CWD was first discovered in Colorado in 1967. Since 1967, CWD has been found in both domestic and free-ranging populations in a number of states and Canadian provinces. Maryland, New York, Virginia and West Virginia are the closest states where CWD has been detected.

FREE-RANGING CERVIDS:

Standard carcass handling and food safety guidelines should be followed for hunter-harvested deer and elk. As a precaution, people or domestic animals should not eat meat from any unhealthy appearing animal.

Pennsylvania hunters going out-of-state to hunt in a state or province with a history of CWD should be aware of regulations in Pennsylvania and in those areas regarding testing and disposal of high risk material. Specific carcass parts are prohibited from being imported into Pennsylvania: the head (including brain, tonsils, eyes and lymph nodes); spinal cord/backbone; spleen; skull plate with attached antlers, if visible brain or spinal cord material is present; cape, if visible brain or spinal cord material is present; upper canine teeth, if root structure or other soft

material is present; any object or article containing visible brain or spinal cord material; and brain-tanned hides. If a hunter returns with body parts of a cervid that tests positive for CWD, or if a taxidermist becomes aware of an illegally imported cervid, they should contact PGC for proper disposal guidance.

CWD testing of healthy appearing hunter-harvested deer or elk is available. Hunters who wish to have their animal tested may do so for a fee by making arrangements with the New Bolton Center Laboratory near Philadelphia (610-444-5800).

Free-ranging deer or elk that do not appear to be normal (especially those that are thin and showing neurological signs) should be reported promptly to the appropriate Pennsylvania Game Commission Regional Office.

CWD has not been detected in hunter-harvested cervids in Pennsylvania. This testing will continue for the foreseeable future. In the event that any animal tests positive for CWD, the individual hunter will be notified, as well as the public.

DOMESTIC CERVIDS:

The Pennsylvania Department of Agriculture has implemented importation restrictions and a mandatory CWD program for domestic cervid farmers to test for CWD. If domestic cervids are suspected of disease, PDA must be notified and the suspect animal must be collected by an animal health official.

For more information, visit either the website of the Game Commission, www.pgc.state.pa.us, or the Pennsylvania Department of Agriculture, www.agriculture.state.pa.us.

Appendix D: CWD Scenarios and Responses

Action will be initiated if there is an index case originating in the wild or on a farm within the Commonwealth, or if the disease is detected in an expanding CWD endemic area within 10 miles of our border.

In all cases the operational objectives are the same: 1) mitigate all possible risk factors; 2) implement a communications program to provide accurate and timely information on the disease, maintain our hunting heritage, and develop public support for management actions; 3) if present in the Commonwealth, determine the distribution and prevalence of CWD in free-ranging cervids around the index case; and 4) attempt to prevent spread and increased prevalence of CWD in the Commonwealth. Below are three different scenarios with guidance actions for the lead agencies involved.

- I. CWD is detected outside Pennsylvania within 10 miles of our border from an expanding CWD endemic area.
 - A. Implementation of Appendix C: Education/Outreach/Communications on Surveillance Activities to enhance public and official outreach, and to obtain cooperation from landowners and the general public.
 - B. Define the geographic area of Pennsylvania influenced by the out-of-state case. This Disease Management Area (DMA) will be created either by Executive Order or regulation using roads and other physical features. Generally this area will be a 10 mile radius from a positive case to address the known dispersal distance of yearling male deer (Diefenbach, et al, 2008). In this area, disease management goals will take priority over recreational and deer population management goals.
 - C. Implement risk factor mitigation within the DMA to possibly include:
 1. prohibition of the feeding of deer to prevent congregation and enhanced disease transmission.
 2. prohibition of the rehabilitation of deer to prevent human-assisted transmission of the disease on the landscape.
 3. restriction of transportation of carcass parts to prevent human-assisted transmission of the disease on the landscape.
 4. liberalize harvest to eliminate positive animals and modify antler restrictions to target the more susceptible males.
 5. prohibition of cervid urine-based lures to prevent introduction of the disease.
 - D. Increase sampling effort to possibly include road killed deer, crop damage mortalities, and hunter-killed deer, including the possibility of mandatory checking and sampling, to increase the probability of early detection and to remove positive animals and high risk parts from the DMA.
 - E. Work collaboratively with adjacent endemic states to determine CWD prevalence and distribution.
- II. CWD is detected in Pennsylvania in a free-ranging cervid.
 - A. Implementation of Appendix C of the applicable Communications and Outreach.
 - B. The response will proceed according to the following sequence:
 1. PGC Bureau of Wildlife Management Director immediately will request release of any available CWD funds from US Department of Agriculture (USDA).
 2. A Disease Management Area (DMA) will be created either by Executive Order or regulation using roads and other physical features.
 3. The Executive Director may issue emergency regulations liberalizing legal harvest; banning cervid rehabilitation, feeding, use of cervid urine-based

- attractants; restricting transportation of carcass parts; and eliminating antler restrictions within the DMA.
4. Regional staff may establish facilities within or near the index case that allows for necessary planning, communication, supply, and space for surveillance, carcass storage, and tissue collection activities. If suitable PGC facilities do not exist, alternatives will be explored with other public and private entities.
 5. Regional staff will establish landowner contact teams and sampling teams, and will develop disposal solutions with local landfill operators.
 6. PGC and USDA, APHIS, WS personnel may act as sharpshooters to increase the success of surveillance and to decrease dispersal of cervids. Teams will begin harvesting free-ranging cervid populations within the DMA at a level adequate to describe the prevalence and distribution with high confidence.
 7. Sampling on private land will be preceded with in-person contact by landowner contact teams. Landowner contact teams will be trained and equipped to deliver key messages designed to inform and reassure landowners about the purpose and scope of the surveillance effort.
 8. In cooperation with the Pennsylvania Department of Transportation (PennDOT) and its contractors, road-killed deer within the DMA will be collected for testing.
 9. Mandatory testing of hunter-killed deer within the DMA will necessitate emergency orders or regulations requiring hunters to present harvested deer to a check station. Cooperation with taxidermists in the area also may be employed for collecting samples. With direction and assistance from the Bureau of Wildlife Management, regional staff will establish check stations.
 10. The obex, medial retropharyngeal lymph nodes (MRLN), and tonsils will be removed at the field laboratory. General necropsies may be performed for the harvesting of other high-value tissues.
 11. Initially, all sampled deer may be marked for identification and refrigerated or frozen until disease status is determined. Final disposal of deer may employ a combination of incineration, landfilling, alkaline digestion, composting, and food kitchen programs. Disposition decisions will depend on disease status, location, season, and efficiency and efficacy of each option. The Wildlife Veterinarian will coordinate carcass storage and disposal with regional staff.
 12. If disease management activities occur within the elk range, elk sampling may include *ante-mortem* testing, including tonsil and rectal mucosal biopsies. Elk will be immobilized, biopsied, and radio-collared, rather than being harvested, to collect samples. If CWD is detected in an elk, it subsequently will be located via radio-telemetry and euthanized.
 13. If additional infected cervids are detected within the DMA, it will be expanded for a distance of 10 miles encircling the additional positive case(s) and surveillance will continue in the newly affected area as described above.
 14. If, after 5 years of disease management, CWD-infected free-ranging cervids are not found in the DMA, modifications will be made to the disease management strategy predicated on existing risk factors.
 15. Effectiveness of management strategies will be evaluated based on CWD prevalence and distribution, which will be estimated annually. Deer population and harvest monitoring with marked animals may be used to inform management actions. Surveys of hunters, residents, and other affected parties may be used to evaluate effectiveness of, or need for, additional education or communication programs. Based on this information, the CWD response team will periodically make recommendations to the Executive Director for taking specific action.

- C. For all domestic cervid premises, which are not part of the CWD investigation, located in a DMA initiated by a CWD positive free-ranging cervid; PDA will implement a herd plan which may possibly include the following:
 1. Quarantine and recommend depopulation
 2. In the absence of depopulation, require continuous testing of all death losses and recommend double fencing for increased security.
 3. Intrastate movement of live domestic cervids will only be permitted from CWD Certified herd participants that test all death losses.
 4. Inspection of records, testing, fencing, and other requirements that can prevent the spread of CWD

III. Identification of an NVSL-confirmed CWD positive domestic cervid premises:

- A. USDA-APHIS-VS and PDA will initiate herd plans with a goal of containing the CWD positive and exposed cervids.
 1. Quarantine the source premises of the CWD positive cervid. The quarantine extends to live cervids, dead cervids, feces, urine, semen, and equipment that may be contaminated with the CWD prion.
 2. Herd depopulation is recommended and indemnification may be provided when possible.
 3. All dead animals will be tested for CWD. Tissues will be extracted by PDA or USDA-APHIS employees.
 4. Incineration, alkaline digestion, landfill, or composting of carcasses and contaminated materials will be utilized.
 5. Quarantine revocation pending current state and/or federal protocols to minimize the spread of CWD.
 6. The Pennsylvania Designated CWD Epidemiologist shall conduct a complete epidemiological investigation.
 - a. Trace forward exposed cervid(s).
 - i. Quarantine premises that received exposed cervid(s).
 - ii. Recommend euthanasia and test exposed cervid(s) received from the positive premises, with indemnity if possible.
 - iii. If an exposed animal is positive, the entire herd is considered positive.
 - iv. If negative results on exposed cervid, CWD surveillance will continue.
 - b. Trace back positive cervid(s).
 - i. Quarantine the trace back herds as appropriate
 - ii. Recommend depopulation and CWD testing with indemnity if available.
 7. Surveillance of any trace forward or trace back herd (testing all death losses) will continue for a period of time consistent with current knowledge of the disease agent and its persistence in the environment.
- B. The PGC response measures will proceed as described in the scenario for an infected free-ranging cervid, with the Disease Management Area drawn around the location of the CWD positive domestic cervid premises.

Appendix E: Carcass Disposal Plan for CWD Positive Animals

Cervid carcasses or their butchered remains have been disposed in Pennsylvania since cervids were first hunted. Since the advent of environmental regulations in the 1970s, the most common disposal methods have been landfills including municipal waste landfills and deer disposal pits, rendering plants, and decomposition in the natural environment. Since the hunter ethic in Pennsylvania stresses using the meat of animals taken during a hunt, the most common materials requiring disposal are butcher waste (head, bones, internal organs, hides) and vehicle-killed deer. Butcher waste has traditionally gone to rendering plants or is sent to the local landfill along with other trash (entrails have traditionally been removed from the cervid in the field and left for scavengers). Vehicle-killed deer have traditionally been picked up by PGC employees and PennDOT contractors and taken to local landfills. Although deer disposal pits were widely used in the 1970s and 1980s, their use is limited today.

In the event CWD is found in Pennsylvania, disease management activities will begin (Appendix D) and disposal of large numbers of potentially CWD-positive animals will be required. The four viable options for environmentally sound disposal of CWD-positive carcasses are 1) landfilling in a site which meets modern sanitary landfill standards such as engineered liners, caps and leachate and gas collection systems; 2) incineration in a controlled system at temperatures sufficiently high to destroy the prion; 3) alkaline digestion with a strong base such as sodium hydroxide (lye) combined with elevated temperature and pressure; and 4) pre-composting in an approved area followed by one of the aforementioned options for disposal of remains.

Landfilling

In general, landfilling is the most cost effective of the four major options for disposing of CWD positive cervids. The advantages include the ability to handle large numbers of animals and the transportation infrastructure. A disadvantage to landfilling is while it is effective at containing the prions; this method of disposal does not immediately destroy the prion. It is expected that the prions in the landfill will degrade over time, but it is not known how long it would take to completely inactivate all prions. Information on Pennsylvania Municipal Waste Disposal Facilities can be located at

<http://www.depweb.state.pa.us/landrecwaste/cwp/view.asp?A=1238&Q=463564>.

There are three sub-options for landfilling, each progressively reducing the risk of prions leaving the system, but each also progressively becoming more costly. The first sub-option is to use an existing modern sanitary landfill, which is the simplest and least expensive to implement. The second is to use an existing sanitary landfill but restrict the area used for cervid disposal so that any leachate collected from this area can be handled separately. This reduces the concern that prions could escape through the leachate extraction and wastewater treatment system. However, it increases the cost and introduces a number of operational concerns that may be counterproductive to the containment of the prions. The third is to build a landfill dedicated to cervid carcasses. Unlike a deer disposal pit, this landfill would be fully engineered with all the environmental safeguards required of modern sanitary landfills (liner, leachate collection system, etc.). The extracted leachate would be low in volume and could be solidified on-site and reintroduced into the landfill, creating a closed loop system. This sub-option could be designed for the number of carcasses expected and expanded as future needs dictate. However, siting requirements may preclude its use.

Incineration and Heat Inactivation

Incineration is a proven technology for disposing of TSE-infected animal carcasses. It has been used in North America and Europe. In order to denature and destroy the prion, the European Union recommends a temperature of 850° C (1562° F) or above for at least two seconds for direct incineration of carcasses.

There are two sub-options for incinerating carcasses. The first is to use a controlled furnace, which is equipped with a primary and secondary combustion chamber. This includes pathological incinerators and animal crematories. These units are expensive and have a limited capacity, but are able to effectively meet the temperature criteria listed above. The second method is to use an "air curtain destructor". This is a combustion unit consisting of an open topped pit or combustion box with a fan mounted along the length of the box. The unit is fueled with wood and the fan serves to provide oxygen as well as provide a curtain of air over the open top of the box to prevent the escape of smoke and unburned particulates. This method has been used in a number of other states for burning CWD carcasses as well as animals with other diseases. The drawback to this method is that it is extremely difficult to operate reliably since wind, rain and loading operations will disrupt the curtain and allow smoke to escape. It is also very difficult to maintain consistently high temperatures throughout the combustion box, and there is no secondary chamber to burn organics escaping with the flue gas.

Alkaline Digester

Although commonly called a "digester" this method of carcass disposal is based on alkaline hydrolysis. The basis of this technology is the use of sodium or potassium hydroxide solutions under pressure and at elevated temperatures (~150° C) to hydrolyze proteins into peptides and amino acids. As TSEs are believed to be caused by an abnormal prion protein, this technology is ideally suited for inactivation and disposal of infected animals and tissues derived from them.

The limitations of this technology are its relatively high start up cost and limited through-put capacity. In addition, the digested material is extremely high in biological oxygen demand and requires dilution when introduced to a wastewater treatment plant.

There are two such units potentially available in different parts of the Commonwealth and their use will be determined based on logistical and volume constraints.

Composting

Proper composting following PDA and DEP regulations is permitted initially for all animal carcasses. Once composting is complete, carcasses that are from CWD positive or untested animals from the DMA must then be properly stored and disposed by landfill, incineration, or via alkaline digestion to ensure containment of the agent.

Planned Disposal Activities

In the event that CWD is diagnosed in Pennsylvania, disease management activities will begin. Hunters will play an important role in these activities. Within the DMA, it is recommended that hunter-harvested cervids and domestic cervids should be processed and individually stored until negative test results are confirmed.

Unwanted test-negative carcasses and carcass parts will be disposed of in existing landfills, based on their low risk of spreading the disease and their low relative cost. Operational

guidelines (e.g. delivery in metal drums, immediate covering, placement that maximizes the travel distance to the leachate collection system) can be established to further reduce any risk associated with landfilling.

CWD-positive carcasses will be disposed by PADLS via incineration or alkaline digestion. Should additional incineration capacity be needed, the Pennsylvania Department of Environmental Protection will be consulted for additional incineration sites.

If necessary, a number of landfill locations around the state could be established for dedicated animal carcass disposal purposes. These sites would be designed and the siting process completed, but not constructed until needed. These sites could provide an option in those cases where existing landfill operators are unwilling to accept the carcasses. From a statewide perspective, these sites would be expected to be few in number and extremely small in size compared to existing sanitary landfills.

Risks

The risks of using existing landfills and incinerators for the disposal of carcasses are minimal. These disposal methods have been used for many years for general animal carcass disposal and will continue in the foreseeable future. No adverse impacts have been identified. Carcasses that may be infected with CWD do not significantly change that situation. The greatest negative impact of using existing landfills is public perception. A public education and outreach effort is the best method of correcting this misperception.

Appendix F: Contact Addresses and Telephone Numbers

Pennsylvania Animal Diagnostic Laboratory System (PADLS)

Pennsylvania Veterinary Laboratory	New Bolton Center	Animal Diagnostic Laboratory
Pennsylvania Department of Agriculture	University of Pennsylvania	Pennsylvania State University
2305 North Cameron Street	382 West Street Road	Orchard Road
Harrisburg, PA 17110	Kennett Square, PA 19348	University Park, PA 16802
717-787-8808	610-444-5800	814-863-0837

Pennsylvania Department of Agriculture (PDA)

2301 North Cameron Street
Harrisburg, PA 17110-9408
Telephone 717-772-2852
Fax 717-787-1868
Contact Person: State Veterinarian

Pennsylvania Department of Environmental Protection (DEP)

P.O. Box 2063
Harrisburg, PA 17105-2063
Emergency Response Director 717-787-5027
General Telephone 717-783-2300
Fax 717-772-3314
Contact Person: Director, Environmental Emergency Response

Pennsylvania Department of Health (PDH)

Health and Welfare Building
Harrisburg, PA 17108
Emergency Telephone 717-737-5349
Fax 717-783-3794
Contact Persons: Public Health Veterinarian 717-346-4524
CDC Epidemiologist 724-662-6081

Pennsylvania Game Commission (PGC)

2001 Elmerton Avenue
Harrisburg, PA 17110-9797
General Telephone 717-787-4250
Fax 814-865-3907
Contact Persons:
Wildlife Veterinarian 814-863-8370
Director, Bureau of Wildlife Management 717-787-4259 x3400

Pennsylvania State University/Cooperative Extension Office

0111 Henning Building
University Park, PA 16802
Telephone 814-863-5849
Contact Person: Extension veterinarian

7 Ferguson Building
University Park, PA 16802
Telephone 814-863-0401
Contact Person: Wildlife extension agent

U.S. Department of Agriculture, APHIS, Veterinary Services (USDA-APHIS-VS)

2301 North Cameron Street, Room 412

Harrisburg, PA 17110

Telephone

717-237-7440

Fax

717-782-4098

Contact Person: Area Veterinarian-in-Charge

U.S. Department of Agriculture, APHIS, Wildlife Services (USDA-APHIS-WS)

PO Box 60827

Harrisburg, PA 17106

Telephone

717-236-9451

Fax

717-236-9454

Contact Person: State Director

U.S. Geological Survey/ Pennsylvania Cooperative Fish and Wildlife Research Unit

Pennsylvania State University

419 Forest Resources Building

University Park, PA 16802

Telephone

814-865-3992

Contact Person: Cooperative Unit Leader

Appendix G: Signature Page

PENNSYLVANIA DEPARTMENT OF AGRICULTURE



George Greig, Secretary

7-11-11
Date

PENNSYLVANIA GAME COMMISSION



Carl G. Roe, Executive Director

7/18/11
Date

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION



Michael Krancer, Secretary

7-19-11
Date

PENNSYLVANIA DEPARTMENT OF HEALTH



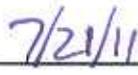
Eli N. Avila, Secretary

07/19/11
Date

UNITED STATES DEPARTMENT OF AGRICULTURE
Animal and Plant Health Inspection Service, Veterinary Services



Michael Kornreich, Area Veterinarian-in-Charge

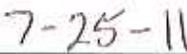


Date

UNITED STATES DEPARTMENT OF AGRICULTURE
Animal and Plant Health Inspection Service, Wildlife Services



Harris Glass, State Director



Date