Texas Chronic Wasting Disease Management Plan

Revised (April 24, 2003)

Prepared by

The Texas Animal Health Commission

And

The Texas Parks and Wildlife Department

EXECUTIVE SUMMARY

Texas Animal Health Commission (TAHC) and Texas Parks and Wildlife Department (TPWD) cooperatively developed the Texas Chronic Wasting Disease Management Plan. The agencies recognize the need for full cooperation and partnership among government agencies, groups, private landowners, hunters and the public should CWD occur in Texas. CWD is a reportable disease and TAHC has authority for reporting and tracking this disease in alternative livestock, which includes elk, and white-tailed deer and mule deer held under authority of Scientific Breeder Permits. TPWD has regulatory authority for free-ranging white-tailed deer and mule deer, and deer held under authority of Scientific Breeder Permits.

The Texas Chronic Wasting Disease Management Plan describes the surveillance sampling strategy and the decision-making process should CWD be detected in the State of Texas. The plan provides information about CWD, a comprehensive management approach to reduce the threat of the disease to susceptible free-ranging and captive-species and an approach for developing effective management of CWD should it emerge within the State.

Chronic Wasting Disease (CWD) is a little known, infectious neurological disease in the family of infectious diseases known as transmissible spongiform encephalopathies (TSEs). CWD is only known to occur in white-tailed deer, mule deer, black-tailed deer and elk. It has not been identified, to date, in other species. Other TSEs include bovine spongiform encephalopathy (BSE) in cattle, scrapie in domestic sheep, Creutzfeldt-Jakob disease (CJD) and a new variant (vCJD) in humans. CWD is a progressive, fatal disease of susceptible cervids with no known immunity, vaccine, or treatment. **CWD HAS NOT BEEN FOUND IN TEXAS.** CWD has been found in free-ranging and/or captive cervids in 13 states or Canadian provinces. CWD has not been found to be contagious to other cervids, livestock or humans at this time. Although BSE has been associated with a new vCJD in humans, the Center for Disease Control reports there are no parallel cases associated with CWD in humans in the U.S. after intensively reviewing over 575 cases of CJD. CJD occurs naturally in the

population at about one in every million persons. Scrapie, a TSE in domestic sheep, has been known for over 250 years, and has not been transmitted to humans although precautions are recommended to avoid brain, spinal tissue and lymph glands in process meat for human consumption. The World Health Organization has recommended similar precautions for deer and elk in the U.S. and there is no evidence that consumption of venison has affected humans in the endemic area where the disease has been for over 35 years.

CWD was discovered in the 1960s, and was first identified in experimental elk that had been taken from the wild and placed into the pens in northeastern Colorado. Origin of the disease may never be determined, it is speculated to have mutated from sheep scrapie or was spontaneous, no one knows. CWD received little attention until it was discovered in Nebraska and concerns were raised when free-ranging white-tailed deer in southern Wisconsin in early 2002 were confirmed as being infected with CWD. Experiments are being conducted to determine whether or not other ruminant species, including wild ruminants, exotics, domestic cattle, sheep and goats, to determine if they may be inflected with CWD by direct or indirect contact with CWD-infected deer and elk. At this time there has been no evidence of transmission of CWD to these other species.

Targeted surveillance of clinical deer (those displaying symptoms, i.e. emaciation, staggering, excessive salivation, and tremors) was initiated statewide in Texas in the summer of 2002. These symptoms can also be representative of many other known diseases and conditions in deer in Texas. TPWD and TAHC began collecting samples from deer in the summer 2002 and during the 2002-2003 hunting season. A total of 2020 deer were sampled and all were negative for CWD, (See Appendix A: Results of CWD Sampling pg. 13) Surveillance sampling is to be continued for the next three to five years in order to determine whether or not CWD is in Texas deer populations.

In the event that a CWD positive animal should be detected in Texas, initial efforts will focus on sampling in the immediate area surrounding the location of the index animal. The sampling area should be of adequate size and contain a sufficient number of animals to detect three additional positive cases at an infection rate of two per-cent of the herd. If additional positive cases are detected in the sample, additional sampling will be necessary to determine distribution and prevalence of the disease. The index case location would be GIS referenced and mapped with a sampling area delineated. The diameter of the sampling area, from which 150 samples would be collected for example, could be eight miles in a high-density deer area and could be sixteen miles in low-density deer area. However, this sampling approach would only occur after consultation with landowners within the sample area and only through the concurrence, cooperation and assistance of the landowners.

TAHC rules would apply only to deer held under authority of Scientific Breeder Permits or elk within a holding pen or facility. Upon detection of a CWD-positive animal in a captive or penned situation and consultation with the owner, TAHC may elect to monitor the herd with special condition (i.e. double fencing) or indemnification for eradication of the herd. Landowners surrounding the holding pen or facility would be notified and sampling with landowner permission discussed.

TPWD Law Enforcement will enforce the Importation Rules as they are now in place. Violation of the TAHC importation rules is classified as a misdemeanor; however, wildlife imported illegally into Texas would be prosecuted under the Lacy Act, which is a federal felony, and TPWD and the U.S. Fish and Wildlife Service would cooperate in such a prosecution.

Contingency plans to control any potential spread of CWD include: 1) evaluation of the system where the positive is detected, 2) determination of herd attributes or physical barriers that may limit distribution and movement of animals, and therefore disease and 3) seeking cooperation, assistance, and permission of landowners potentially affected by the sampling effort. Strategies for possible treatments will be discussed and reviewed with TPWD advisory committees and affected groups.

PURPOSE

The purpose of this Chronic Wasting Disease Management Plan is to effectively manage CWD should it emerge within the state and provide information to the public.

PROBLEM

CWD is a disease threat to North American deer and elk populations. There is no scientific evidence CWD can infect humans. Nonetheless, the risk of potential negative impacts because of misinformation is real. Should substantial numbers of Texas hunters choose to quit deer hunting because of perceived human health risks, deer populations will increase with adverse effects on wildlife habitat, which would consequently affect other game and non-game species.

Since hunting is one of Texas' cherished cultural traditions and produces 3.6 billion dollars annually in revenues, the possible economic impact of a reduction in hunting would be substantial to local and state economies. Decreased revenues from deer leases could also impact landowners that are utilizing this money to maintain solvent ranching/farming operations, wildlife habitat, and open space. The negative impact to wildlife management, research and law enforcement at Texas Parks and Wildlife would also be great, as a large share of the funding for these programs is derived from license and permit revenue.

INTRODUCTION

CWD is an infectious neurological disease of which little is known to date that occurs in North American deer and elk. CWD belongs to the group of infectious diseases known as transmissible spongiform encephalopathies (TSEs). Other TSEs include bovine spongiform encephalopathy (BSE) in cattle, scrapie in domestic sheep, Creutzfeldt-Jakob disease (CJD) and a new variant (vCJD) in humans that is associated with BSE. CWD is a progressively fatal disease of susceptible cervids with no known immunity, vaccine, or treatment.

Sampling was conducted in 2002-2003 and CWD has not been found in Texas. CWD has been found in free-ranging and/or captive deer and elk in 13 states or Canadian provinces (see **Appendix B. Chronic Wasting Disease: Status of Current Knowledge**, for additional information pg. 15).

Several aspects of CWD (e.g., long incubation period and the current market for captive elk and deer involving intra- and interstate movement of these animals) contribute to the concern of potential risk of introducing and spreading this disease and to the difficulties associated with managing it. Strict safeguards are the most effective means of preventing the introduction and establishment of this disease in Texas.

Management guidelines and strategies currently employed by various state and federal natural resource and agricultural agencies vary widely and are changing rapidly. Management of CWD is complicated by a number of factors. Much about CWD remains unknown or poorly understood. Clinical signs of the disease may not become apparent in a deer or elk for 18-36 months (incubation period), during which time the animal is potentially infectious to other susceptible cervids. Currently, the only reliable test for CWD is a post-mortem test.

Although the first cases of CWD were detected in a state research facility of captive deer and elk in the late 1960s, it was not until the mid 1980's to early 1990s that additional infections drew the attention of the scientific and management communities. Management has been further complicated by the fact that regulatory authority governing the operators of privately-owned deer and elk has been either divided between agencies (e.g., Departments of Agriculture, Boards of Animal Health, and Departments of Natural Resources) or were unclear (e.g., until about 1991 in South Dakota). Frequently, different statutes and rules apply and enforcement capacities and abilities vary across agencies. The number of captive susceptible cervid operations and animals, financial investments and the intra- and interstate movement of elk and deer also vary markedly among states.

Although the exact method of transmission is unknown, it is known that CWD is transmitted from animal to animal. Transmission through body fluids such as feces, urine or saliva is possible. Animals that are crowded or confined have a greater chance of encountering the body fluids of other animals and, therefore may have a higher likelihood of becoming infected if the disease is present. Additionally, the close social interaction of deer and elk among herd mates may increase the likelihood of disease transmission. High fences may not be a barrier to disease transmission because of the possibility of nose to nose contact through the fence.

TEXAS CWD STATUS

Captive Cervids

There have been no reported CWD infections of captive elk or deer in Texas. There is currently no mandatory surveillance program for susceptible cervids kept on game farms, although, there has been voluntary surveillance since 1999, which requires owners of participating herds to maintain an annual herd inventory and submit samples for all mortalities of animals over 16 months of age.

Free-Ranging (Wild) Cervids

There have been no reported CWD infections of free-ranging susceptible cervids in Texas. Currently targeted surveillance of free-ranging cervids having clinical symptoms is ongoing in Texas with no positives identified. Additionally, sampling of hunter-killed animals was initiated statewide during the 2002-2003 deer hunting season and sampling will be continued for the next three to five years.

Historic Status

Some have speculated that CWD is "spontaneous" and may exist naturally at low levels, even in Texas. The Texas Wildlife Disease Project, a cooperative research project between TPWD and Texas A&M University (circa 1965-1975), was created to address two disease issues; a) low reproduction in Texas pronghorn and b) "circling disease" in white-tailed deer. One of the leading veterinary pathologists on this project was already suspicious that the etiology of "circling disease" was scrapie being transmitted from sheep to deer. During the project's existence, a total of 780 clinically affected animals (601 white-tailed deer, 7 mule deer, 2 elk, and 170 exotic deer and antelope) were collected. Tissues, including brain and lymph nodes, from the collected animals were examined for spongiform histological lesions, and all were found to be negative. Had CWD (a form of TSE, like scrapie) existed in Texas during this time frame, it is probable that these investigations would have detected these classic histological lesions, especially in clinically affected animals. It

must be noted, however, that the current laboratory tests used to diagnose CWD were not available during the time the Wildlife Disease Project so it can not be stated with absolute certainty that CWD was not present.

PLAN FOR MANAGEMENT OF THE DISEASE IN TEXAS

Diseases such as CWD tend to be managed more effectively when efforts are applied before or as the disease emerges, rather than after it becomes established. CWD is an emerging disease. The current number of known infections within private elk and deer breeding facilities varies markedly among states (and Canada) and is increasing steadily with continued and expanding surveillance and investigations. The geographic spread of CWD in free-ranging mule deer, white-tailed deer and elk is a concern. The recent discovery of CWD in free-ranging white-tailed deer in Wisconsin and Illinois, approximately 700 miles east of any previously known infection, and the discovery of several CWD positive mule deer in New Mexico, approximately 35 miles north of the Texas border were well out of the known boundaries of the disease.

The disease prevalence appears to be increasing in localized areas, although it is not clear whether this is due to increased incidence, or increased surveillance, reporting, and testing. Information from states with direct experience in managing CWD is being used for developing Texas plans as we learn from their experiences.

TPWD and TAHC are developing stepped up targeted and geographically-focused surveillance plans to monitor free-ranging deer for the presence of the disease and a rapid response plan to guide both TPWD and TAHC should CWD be detected in the State. TPWD and TAHC are also evaluating cervid management laws, rules, and policies for free ranging and scientific breeder permitted cervids under their authority to identify issues and potential weaknesses related to disease management. In these efforts, TPWD and TAHC will work with other agencies and organizations responsible for or are concerned about cervid disease management in an attempt to ensure comprehensive approaches to effective management of CWD risks (see Appendix C: Importation of Susceptible Cervids).

TAHC and TPWD have split jurisdictions and regulatory responsibilities, which creates challenges for both agencies (i.e., TAHC responsible for elk, TPWD responsible for white-tailed deer and mule deer). Both agencies will cooperate to resolve issues as they arise.

COMPONENTS OF THE PLAN

1. Education and information sharing with public, constituents, and other government agency personnel concerning CWD.
2. Ongoing targeted surveillance of clinical deer statewide (i.e., collecting and CWD- testing deer/elk exhibiting symptoms that may be consistent with CWD).
3. Development and implementation of a geographically-focused Monitoring Plan involving the sampling and CWD-testing of hunter-harvested deer.
4. TAHC Rules for Importation of Susceptible Cervids (**Appendix C**).
5. Response Plan for CWD should it occur in Texas(**Appendix D**).
6. TAHC rules for monitoring for CWD in breeding facilities (**Appendix E**).
7. Media Response plan development in the possible event of a positive CWD occurrence (**Appendix F**).
8. Advance education of relevant professionals such as resource agency personnel, private wildlife consultants, veterinarians, landowners, wildlife co-ops, taxidermists, and others.

EDUCATION AND INFORMATION SHARING

TPWD/TAHC will help educate and share current information with the general public, constituent groups, and other government agency personnel. These efforts will include website updates, distribution of brochures, periodic news releases, public meetings, informational workshops, agency communications and reports. This information will include: 1) basic history and understanding of CWD; 2) its nationwide distribution, and status of knowledge of the disease (e.g., epidemiology, transmission, clinical signs, population effects); 3) other CWD related issues and concerns (e.g., carcass handling and meat consumption, transmission potential to humans and livestock, deer feeding); and 4) management and research actions being taken by TPWD and TAHC. Information may also be designed to focus on specific issues of importance to landowners, hunters, meat processors, taxidermists, deer feeders, veterinarians, rehabilitators, feed companies, feeder manufacturers and operators of captive deer and elk facilities.

Publication of technical findings of research in peer-reviewed journals and agency reports will be strongly encouraged. The more informed all agencies and the public (including hunters) become, the more effectively CWD risks will be managed in the future.

Informing and educating the public, constituents, TPWD and other agency personnel about CWD is essential. Development of informational brochures and leaflets for public and intra-/interagency distribution containing information about CWD being directed toward general public (including hunter) interests and concerns are a necessity. This information will be distributed as follows:

- Available at all TPWD offices statewide.
- Carried by Wildlife Biologists, Game Wardens and Park Peace Officers.
- Distributed to potential contact agencies and individuals.
- Potential contact agencies/individuals (in alphabetical order) include:
    - Cooperative Extension Service
    - Exotic Wildlife Association
    - Federal Natural resource and land management agencies, NPS, USFWS and USFS
    - Governors Office, EOC
    - Military installations
    - Sportsmen Conservationists of Texas
    - Texas Ag. Council
    - Texas Agricultural Extension Service
    - Texas Animal Health Commission
    - Texas Chapter of the Wildlife Society
    - Texas Deer Association
    - Texas Department of Agriculture
    - Texas Game Warden Association
    - Texas Grain and Feed Association
    - Texas Farm Bureau
    - Texas Taxidermists Association
    - Texas Veterinary Medical Diagnostic Laboratory
    - Texas Veterinary Medical Association
    - Texas Wildlife Association
    - TSCRA (Texas and Southwestern Cattle Raisers Association)
    - TS&GRA
    - USDA/APHIS
    - Wildlife rehabilitators

Should CWD occur it could have a significant adverse economical impact upon landowners, local communities and landowners possessing deer held under authority of Scientific Breeder Permits and elk. Special emphasis would be directed toward informing all constituents that potentially could be affected by the discovery of CWD in the State. These efforts could be accomplished through the completion of a general news packet, video releases, TPWD/TAHC web sites, as well as television and radio news releases, as well as partner publications and information systems.

Informing and educating TPWD wildlife biologists and law enforcement personnel is also critical, as these individuals will generally be the first lines of information for the public and press. Internal distribution of relevant information in a timely manner will aid TPWD personnel in addressing any CWD concerns from the public or constituent groups. As information is gathered regarding testing or other pertinent data, TPWD should present this information as requested at interagency meetings and professional meetings/symposia. These data should additionally be published peer-reviewed journals or TPWD Technical Reports. In addition, advance education of relevant professionals such as other resource agency personnel, private wildlife consultants, veterinarians, landowners, wildlife co-ops, taxidermists, feed store personnel, and other similar professions who may be contacted by the public and press for comments should be invited to education workshops.

ONGOING TARGETED SURVEILLANCE OF CLINICAL DEER STATEWIDE

Collecting CWD clinical-free-ranging cervids began in late summer 2002. The collection of clinical deer has been reported by researchers in other states to be particularly useful in detecting the presence/absence of CWD in local areas statewide. TPWD will continue testing clinical free-ranging deer for CWD as they are encountered. Federal funding through APHIS/USDA may be available and would provide for increased sampling during FY-04 sampling period and beyond.

IMPLEMENTATION OF A GEOGRAPHICALLY FOCUSED CWD SURVEILLANCE PROGRAM FOR FREE-RANGING CERVIDS

A geographically-focused free-ranging cervid Monitoring Program was implemented during the fall 2002 deer-hunting season. Brain stem samples from hunter-killed deer will be obtained from TPWD Wildlife Management Areas (WMA), State Parks, and where otherwise available with hunter and/or landowner permission, from deer taken on private land. Volume 1, Sixth Edition of United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services, Regulatory Statistics (**Appendix D1**) indicates that 148 samples is sufficient to detect disease at two per-cent prevalence, regardless of the population size. Therefore the goal is to acquire 148 samples from each of the State's ten ecoregions provided adequate sampling distribution is achieved across each ecoregion. The five year 2002 -2006, goal is to cumulatively collect 459 samples from each of the ten ecoregions. The cumulative sample would be used statistically to detect CWD at one per-cent prevalence level with 99 per-cent confidence. However, funding from APHIS/USDA could provide the necessary funds for sampling at the one per-cent prevalence level each year. TAHC conducted a risk

assessment of counties where deer and elk have been imported and where high densities of free-ranging deer occur. The assessment was conducted for USDA funding consideration. The risk assessment was based on limited number of criteria. Since CWD could potentially occur anywhere in Texas, monitoring efforts would be focused to achieve a stratified sampling scheme across each ecoregion of the State.

Confidentiality laws restrict the type of data TPWD personnel can collect as it relates to a specific parcel of land. Therefore, personnel will ensure that no property specific information is collected (i.e. ranch name or exact location) without the landowner's written permission. The following are guidelines for data and sample collection distributed to TPWD personnel prior to sample collection:

1. A Texas Veterinary Medical Diagnostic Laboratory (TVMDL) Accession Form must be submitted with brain stem samples.
2. The most important items to be filled out are the TPWD employee name, address and phone number, and "Patient/Deer ID". County of Kill can be recorded on the bottom of the form, but DO NOT report any information that identifies the specific parcel of land.
3. The "Patient/Deer ID" number MUST BE specific to the field data sheet the employee is using to record data.
4. Specific CWD field data sheets will not be provided, as current field data sheets (i.e. Age/Weight Antler Data Sheets, Hunter Check Station Data Sheets, etc.) will be appropriate in most cases. Field staff may produce their own CWD data sheet if necessary.
5. The field data sheet must contain:
    a. Employee Name
    b. Sample Number (same as Patient/Deer ID on TVMDL Accession Form
    c. Sample Date
    d. Deer Age
    e. Deer Sex
    f. County of Kill
    g. Hunter Name
    h. Hunting License Number
    i. Ranch name or tract name/location **ONLY** with landowner permission.
6. Should a CWD positive be detected, TAHC will use hunter contact information to conduct CWD investigation under their regulatory authority.
7. Make sure the container containing the brain stem sample is legibly identified with the sample number, deer age and sex, county of kill and date. Although the sample number is all that is

needed, additional information will help resolve any problems should batches of samples be combined.

8. Should a landowner retain deer heads for our sampling purposes, remind the landowner to issue the hunters a proof of sex document as provided for in TAHC 65.10 (c). In addition, a Wildlife resource document (PWD 905) must accompany the head until the carcass reaches a final destination and finally processed.
9. Samples **MAY NOT** be taken from legally harvested deer without the hunter's consent.

ACTIONS SHOULD A CWD POSITIVE BE DETECTED

Should sampling detect a CWD positive animal, TAHC and TPWD would activate the Media Response Plan (**Appendix F**). TAHC and TPWD would immediately begin review of the information at hand and determine the action to be taken within the Response Plan (**Appendix C**.) The first action should be to inform landowners adjacent to the property containing the CWD positive and hold a meeting with advisory committees and affected landowner to discuss plans for secondary sampling. Planning for secondary sampling, investigating movements of deer into and away from property for further actions would then be the next step. The secondary sampling is critical for determining distribution and prevalence of the disease.

As distribution and prevalence is being determined, information review and discussions with TPWD advisory committees (e.g., Private Lands Advisory Board, Hunting Advisory Committee, White-tailed Deer Advisory Committee etc.) and landowners would take place in order to determine the appropriate management action to be taken.

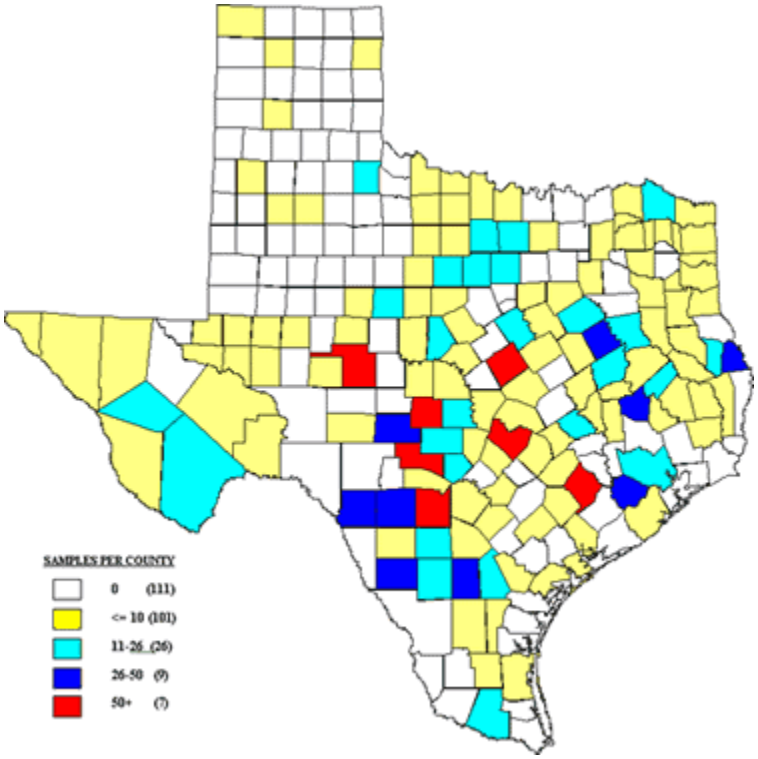
APPENDIX A: Results of CWD Sampling

Sampling and testing results for CWD from June, 2002 to April 1, 2003 are presented below:

Sampling and testing results for CWD from June, 2002 to April 1, 2003

TPWD	TAHC	Private Sector
1349 CWD Negative Deer	335 CWD Negative Deer	336 CWD Negative Deer
23 CWD Negative Exotics	No Exotics	No Exotics
1372 Total	335 Total	336 Total

The Grand Total of all samples collected and known 4/1/03 is 2043 of which 2020 deer and 23 exotics were found CWD negative. Samples were collected from 143 of 254 counties in Texas, and seven counties had 50 or more samples collected. Five ecoregions had 160 or more samples collected (150 samples from each ecoregion was the goal). The geographic distribution of sampling is currently not considered adequate for determining whether or not CWD exists in Texas (see map pg. 15). The goal is to improve upon distribution of samples collected within ecoregions and within counties. The goal of 2003-2004 and the next three to five years, is to collect 5000 samples (500 from each ecoregion) each sample year. The increased sampling is to have a 99 per-cent confidence level in detecting CWD if only one per-cent of the population is infected. Long-term surveillance sampling for CWD is required, as little is known about the incubation and infectious periods of the disease.



APPENDIX B: Chronic Wasting Disease - Status of Current Knowledge

Occurrence and Distribution

Chronic wasting disease (CWD) is a transmissible spongiform encephalopathy, which is a disease that alters the structure of the brain, in a way that resembles a sponge-like appearance and texture. Much is not known about CWD, including its origin, exact mode of transmission, and the causative or

etiological agent. The source of CWD may be related in some way to scrapie in domestic sheep; it may "represent a spontaneous, naturally occurring" form of this disease in cervids thought to be caused by a "low virus infection." A more plausible theory is that CWD is caused by a point mutation of a membrane-bound protein resulting in accumulations of proteinase-resistant proteins called "prions" in the brain (medulla oblongata), tonsils (in deer only), and lymphoid tissue.

The only known long-term distribution of CWD in free-ranging susceptible cervids includes two contiguous local areas in northeastern Colorado and southeastern Wyoming. Up to 15% and less than 1% prevalence were reported for mule deer and elk, respectively, in certain management units. Two cases of CWD occurred in mule deer in the southwestern corner of the panhandle of Nebraska, which is close to the endemic area of Colorado and Wyoming. Both of these latter animals were close enough to have originated from the endemic area. More recently, CWD was diagnosed in deer in Nebraska within and outside a fenced pasture of a captive operation where elk were diagnosed with the disease. Infections in captive elk also have been documented in Colorado, Wyoming, Montana, Oklahoma, South Dakota, and Kansas. In early 2002, CWD was detected in free-ranging white-tailed deer in South Dakota and Wisconsin, later the disease was found in breeder pens in northern Wisconsin. Cases of CWD have been documented in captive elk and free ranging mule deer in Saskatchewan and Ontario as well. New Mexico discovered CWD in a free-ranging mule deer on the White Sands Missile Range, Minnesota found CWD in a captive elk herd, Illinois detected CWD in a free-ranging white-tailed deer and an infected white-tailed deer was found in a breeding facility in Alberta.

Incubation, Transmission, and Clinical Course of CWD

Incubation time, that time from infection to appearance of clinical signs, typically is less than 2 years (18-24 months). However, incubation time can be variable and ranges up to 36 months. The exact mode of transmission of CWD is unknown; however, circumstantial and experimental data indicate horizontal (or lateral) transmission in captive susceptible cervids, either by direct animal-to-animal contact or by environmental contamination. For susceptible cervids, the routes of transmission are presumed to be by exposure to saliva, urine, feces, or placental tissue, with infection occurring through the alimentary canal (mouth/nose - esophagus - stomach - intestines). If this transmission mode is confirmed for free-ranging deer or elk, it could potentially exacerbate the risk of infection. In contrast to outbreaks of mad cow disease, where exposure to animal protein-contaminated feed was documented, this has not been the case for captive or wild cervids infected with CWD. Presently, feed contamination is not considered a likely underlying transmission mechanism. Whereas, the importance of maternal transmission (mother to fetus or nursing young) as a mode of scrapie

transmission in domestic sheep has at least been debated, its importance relative to CWD persistence in captive and wild cervid herds has been contraindicated thus far by current reports. Although the route of agent shedding from infected individuals is presently unknown, it is believed that the rate of agent shedding may very well increase as the disease progresses. Thus far, evidence also indicates that there is no difference between males and females or across age classes in susceptibility to CWD.

Importantly, natural transmission of TSEs (i.e., BSE, CWD) between domesticated bovines (i.e., cattle, bison), sheep and cervids has not been documented. Deer, domestic cattle and sheep have been experimentally inoculated with brain tissue containing (PrP(res)) from CWD - infected mule deer, and 2 years later, only the deer have become infected with CWD. However, healthy deer have been inoculated with brain tissue from scrapie-infected sheep, and the deer developed spongiform encephalopathy.

The clinical course of CWD is about 12 months. That is, once clinical signs are apparent, cervids rarely survive more than 12 months. Chronic wasting disease is a progressive, fatal disease, with no vaccine to prevent the disease or treatment for reversing the disease (recovery), and there is no evidence of immunity. There has been no effective, practical ante mortem (live-animal) test for diagnosis until recently; a live-test for deer (not elk) involving tonsil biopsy and immunohistochemical analysis for (PrR (res)) accumulation has demonstrated promise, and may be more sensitive than the post-mortem analysis of the obex of the medulla oblongata in the brain. The practicality of this test remains to be decided.

Clinical Signs of CWD

All signs or symptoms of CWD do not occur in all cases, and many of these signs are symptoms of other diseases and conditions as well. Further, the occurrence and severity of symptoms will depend in part on the stage (early versus advanced) of the disease. Below is a comprehensive list of the clinical signs of CWD: (1) loss of fear of humans; (2) nervousness or hyper-excitability; (3) teeth-grinding; (4) ataxia or loss of coordination; (5) notable weakness; (6) intractability; (7) inability to stand; (8) rough dull hair coat; (9) excessive salivation; (10) flaccid, hypotonia of the facial muscles; (11) drooping of the head and ears; (12) excessive thirst (polydipsia); (13) excessive urination (polyuria); (14) esophageal hypotonia and dilation, difficulty swallowing, and regurgitating ruminal fluid and ingesta; and (15) severe emaciation and dehydration.

It is important to note that while some primary symptoms may be directly related to CWD, others may be secondary, more of a consequence of the deteriorating body condition (emaciation) and related

physiology (e.g., pneumonia, abscesses, enteritis, or internal parasitism that may often cause emaciation).

Pathological Signs of CWD

Pathological signs of the disease include: (1) emaciation associated with absence or serous atrophy of subcutaneous and visceral adipose tissue or fat, and yellow gelatinous bone marrow; (2) sub acute to chronic bronchopneumonia; (3) digestive tract (abomasal or omasal) ulcers; (4) enlarged adrenal glands; (5) watery or frothy rumen contents; and (6) histological lesions. These lesions have primarily and most consistently been observed in the brain and spinal cord. (7) Immunohistochemistry (IHC) is very sensitive and specific to CWD and is typically used to confirm diagnoses by measuring accumulations of proteinase-resistant prion protein (PrP(res)) in brain tissues (specifically in the obex of the medulla oblongata) of infected deer and elk. This prion protein is indistinguishable from the scrapie-associated prion protein (PrP(Sc)) found in brain tissues of domestic sheep infected with scrapie, but other differences have been noted. (PrP(res)) has not been detected in uninfected cervids. This test can detect CWD infection before lesions are observable; however, IHC (+) results are not detected until at least three months after infection. Lesions do not always accompany (PrP(res)) accumulation and IHC (+) results. (8) Scrapie associated fibrils (SAFs) have been observed by electron microscopy in the brain tissue of infected cervids, but not in uninfected cervids. (9) Generally, blood (whole blood and serum) and urine profiles have remained within the normal range, with the exception that certain characteristics have reflected the emaciated condition of the infected animals. Low specific gravity of the urine, is the one urine characteristic that may be directly related to CWD, specifically to degenerative encephalopathic changes in the hypothalamus. The hypothalamus is important in regulating anti diuretic hormone, which influences concentrations of urinary electrolytes (e.g., Na) and osmolality.

APPENDIX C: Importation of Susceptible Cervids

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.

On August 25, 2002, Texas Animal Health Commission adopted entry requirements for black-tailed deer, elk, or other cervid species determined to be susceptible to CWD. All mule deer and white-tailed deer held under authority of Scientific Breeder Permits are also required to obtain a purchase permit and, in some cases, a transport permit from Texas Parks and Wildlife Department in order to enter the state. All requests for entry must be made in writing and accompanied with the information

necessary to support import qualification of the animal(s). Requests for entry and supporting documentation should be received by the TAHC at least 10 working days prior to the proposed entry date. The processing of the application can be expedited by assuring that all of the necessary documentation has been provided and that the necessary staff is available for review. The application must be accompanied by an owner's statement stating that to his/her knowledge the animals (or donor animals) to be imported have never come in contact with equipment or resided on a premise where CWD was ever diagnosed.

Entry Requirements: The applicant must identify the herd of origin and the herd of destination on both the permit application and the certificate of veterinary inspection. The susceptible cervid(s) to be imported into this state, shall be identified to their herd of origin by a minimum of two official/approved unique identifiers to include, but not limited to, legible tattoo, USDA approved ear tag, breed registration or other state approved permanent identification methods. If a microchip is used for identification, the owner shall provide the necessary reader. A certificate of veterinary inspection completed by an accredited veterinarian shall accompany the shipment. Additionally, the herd of origin must meet the following criteria:

A. In states where there is a state approved CWD monitoring program which meets the requirements provided in Section D of Appendix C (below) and where CWD has not been identified in a susceptible species, then all elk, white-tailed deer, mule deer, and black-tailed deer to be imported must originate from a herd that has been in a state-approved complete herd certification program for a minimum of three years (or current federal standards).
B. From states which do not have a CWD monitoring program which meets the standards provided in Section D of Appendix C (below) and where CWD has not been identified in a susceptible species, then all elk, white-tailed deer, mule deer, and black-tailed deer shall originate from herds that have complete herd records, including, but not limited to, complete and detailed herd inventories, records of deaths, laboratory results, and sales and purchase receipts, for a minimum of five years. Complete documents which support this type of status shall be submitted with the permit application.
C. In states where CWD has been identified in a susceptible species, then elk, white-tailed deer, mule deer, and black-tailed deer (or other susceptible species) to be imported must originate from a herd that has been in a state-approved complete herd monitoring program, as provided in Section D of Appendix C (below) for a minimum of five years.
D. A state-approved chronic wasting disease monitoring program must be certified by the Texas State Veterinarian as meeting the following minimum standards:

1. In states where CWD has been found in free-ranging wildlife, the state program shall have perimeter fencing requirements adequate to prevent ingress, egress or contact with susceptible cervids.
2. Surveillance based on testing of susceptible cervid deaths over 16 months of age is required of all herds within a complete herd monitoring program. Surveillance sampling at commercial slaughter and at shooter operations should be at least 10 percent of the number slaughtered annually.
3. A good quality sampling program where state and federal officials have the authority to adjust herd status if poor quality samples, particularly samples that are from the wrong portion of the brain, are routinely submitted from a premise. Laboratory analysis of the brain stem by United States Department of Agriculture (USDA) approved lab is recognized as the current standard for CWD diagnosis. Other laboratory analyses may be accepted as validated or accepted by USDA/Animal and Plant Health Inspection Service (APHIS).
4. Physical herd inventory with annual verification reconciling animals and identification with records by an accredited veterinarian or state or federal personnel is required. Inventory is to include a cross check of all animal identifications with the herd inventory and specific information on the disposition of all animals not present.
5. Premise locations must be specifically identified by GIS or detailed description during the initial herd inventory.
6. Herd additions are allowed from herds with equal or greater time in an approved state CWD monitoring program with no negative impact on the certification status of the receiving herd. If herd additions are acquired from a herd with a later date of enrollment, the receiving herd reverts to the enrollment date of the sending herd. If a herd participating in the monitoring program acquires animals from a non-participating herd, the receiving herd must start over with new enrollment date based upon the date of acquisition of the animal(s). If a new herd begins with animals of a given status, that status will be retained by the new herd, based upon the lowest status of the animals received. Animals of different status which are commingled during marketing or transport will revert to the lowest status.
7. Elk, white-tailed deer, mule deer and black-tailed deer will only be allowed to enter the state of Texas if the state of origin lists CWD as a reportable disease and imposes an immediate quarantine on a herd and/or premise when a CWD positive animal is disclosed.

8. Animal health officials in the state of origin must have access to herd records for the appropriate number of years (three to five), including records of deaths and causes of death.
9. Section D also addresses entry requirements as they pertain to tuberculosis testing. However, these requirements are not included as a part of the Texas Chronic Wasting Disease Management Plan.

At the November 2002 meeting the TPWD Commission adopted regulations, to suspend the ban on importation of mule deer and white-tailed deer and provide for importation under TAHC requirements. Additionally, the TPW Commission adopted changes to Trap, Transportation, and Transplant rules, which will require a sample of deer to be tested for CWD on any property serving as a trap site for relocated deer. The rule sets forth the minimum sample size, requires the sample to be tested 100% negative by the Texas Veterinary Medical Diagnostic Laboratory and stipulates that all deer transported be uniquely marked with an ear tattoo prior to release.

APPENDIX D: Response Plan for CWD If Detected

1. If the Texas Veterinary Medical Diagnostic Laboratory reports a CWD positive test, the suspect sample will be immediately shipped to USDA Laboratory at Ames, Iowa for conformation of positive finding. The time between initial suspect finding and Ames Lab confirmation will be used to mobilize staff and groups for response plan initiation.
2. The confirmation notice of a positive would come through the USDA Veterinary Services Office in Austin, and USDA/VS personnel would be part of the response effort.
3. Governor's Office will be notified of the finding, as well as Commission members of both TAHC and TPWD.
4. CWD Media Response Plan will be activated (**Appendix F**).
5. Source location of CWD positive concerns:
    A. The source location of the CWD positive animal and information about the area, landowners (to contact for cooperative discussions on further sampling, review of management plans), and the deer density within a 4-8 mile radius will be determined.
    B. Should the source location of the CWD positive be in a Scientific Breeder facility or pen, TAHC will inform and work cooperatively with the landowner. TAHC may elect to monitor the herd with special conditions (i.e. double-fencing) or negotiate indemnification (cap established at $3000.00 for prime breeding animals) for eradication of the herd.

6. GIS locations and mapping for sampling will be utilized.
7. TAHC and TPWD will inform and work cooperatively with landowners and with landowner permission in the sample area that may be affected.
8. TAHC would determine sampling requirements. Sample numbers and the size of the area to be sampled will be determined based upon population numbers and the statistically-based numbers required for detecting CWD at a 2% prevalence level from "Regulatory Statistics Volume 1, Sixth Edition" (See Appendix D1). The numbers of animals to be sampled (projected at 150) would be collected throughout an area from 64-1056 square miles and not from a single property unless it is as large as the sample area around a positive. A square mile is 640 acres, in areas where the herd density is 1 deer per 5 acres an area of 64 square miles should contain 8192 deer (128 deer per section) and less than 3 deer per section will be sampled. In areas where the herd density is 1 deer per 200 acres an area of 1056 square miles should contain 3379 deer (3.2 deer section) a deer per 7 sections would be sampled. This sampling is not designed to reduce the population below viability.
9. Sampling will be conducted at no cost to the landowner in a cooperative manner to detect additional CWD positives, and sampling around any additional positive finds, to determine direction of spread, prevalence of the disease and to determine distribution. Additional samples would be taken surrounding any new positive to determine direction, but re-sampling again in an area previously sampled would not be necessary.
10. Simultaneously with the sampling, a joint investigation into movement of deer into or out of area will be conducted.
11. Identify geologic features or barriers, which may be used to limit population distribution, will be determined.
12. After distribution is determined, reasonable, responsible, and rational management strategies will be determined in association with landowners and applied as situations dictate following sampling activities, to include monitoring at appropriate intervals, herd reduction as a possible strategy, and eradication of local populations in limited appropriate circumstances. Strategies for possible treatments will also be discussed and reviewed with the TTT/MLDP Task Force/ White-tailed Deer Advisory Committee and the Private Lands Advisory Board.
13. TPWD will collect and take samples from cervids and transport sample to Texas Veterinary Medical Diagnostic Laboratory for analysis.
14. Options for CWD testing (i.e. ELISA test) within localities should a CWD-positive be detected will be considered and evaluated. The purpose would be to ensure reliable test results in a timely manner within the local area providing little interruption to hunting and recreation in the area.
15. TPWD must be prepared to make budget and personnel adjustments for the sampling.

APPENDIX D1

United States Department of Agriculture

Animal and Plant Health Inspection Service

Veterinary Services

REGULATORY STATISTICS

Volume 1

Sixth Edition
June 1983
By Victor C. Beal, Jr.

Table 2 - NUMBER NEEDED TO TEST TO BE 95% CONFIDENT THAT THE DISEASE WILL BE DETECTED IF PRESENT AT OR ABOVE FIVE LEVELS OF INCIDENCE OR CONTAMINATION

	INCIDENCE LEVEL OR CONTAMINATION RATE = P				
FLOCK, HERD INCIDENCE LEVEL OR CONTAMINATION RATE = P OR POPULATION SIZE = N	P = .10	P = .05	P = .02	P = .01	P = .005
N	n	n	n	n	n
20	15	19			
50	22	34	48		
100	25	44	77	95	
150	26	48	94	129	
200	27	51	105	155	190
250	27	52	112	174	190
300	27	53	117	189	190
350	27	54	121	201	190
400	27	54	124	210	310
450	28	55	125	218	310
500	28	55	128	224	310

Table 2 - NUMBER NEEDED TO TEST TO BE 95% CONFIDENT THAT THE DISEASE WILL BE DETECTED IF PRESENT AT OR ABOVE FIVE LEVELS OF INCIDENCE OR CONTAMINATION

	INCIDENCE LEVEL OR CONTAMINATION RATE = P				
FLOCK, HERD INCIDENCE LEVEL OR CONTAMINATION RATE = P OR POPULATION SIZE = N	P = .10	P = .05	P = .02	P = .01	P = .005
N	n	n	n	n	n
600	28	56	131	235	378
700	28	56	134	243	378
800	28	56	135	249	421
1000	28	57	138	258	450
1200	28	57	139	264	471
1400	28	57	141	268	486
1600	28	57	142	272	500
1800	28	57	142	275	509
2000	28	58	143	278	517
3000	28	58	145	284	542
4000	28	58	146	287	555
5000	28	58	146	289	563
6000	28	58	146	291	569
10000	28	58	147	294	580
100000	28	58	148	298	596
00	28	58	148	298	598

APPENDIX E: TAHC Rules for Monitoring CWD

Participating herds must have adequate perimeter fencing to prevent ingress and egress of cervids.

Collection and submission of appropriate samples from all cases of mortality in animals over 16

months of age will accomplish surveillance in participating herds. Exemptions are provided for animals consigned to commercial slaughter operations with state or federal meat inspection. An annual inventory in participating herds shall be verified by a TAHC, USDA or accredited veterinarian. All animals over one year of age shall be identified with an official ear tag or other approved identification device. All animals less than one year of age shall be officially identified on a change of ownership.

Herd status designation shall be assigned on the basis of the number of years of participation provided that CWD is not confirmed in the herd:

A. Level A - One full year of participation.
B. Level B - Two to three years of participation.
C. Level C - Four to five years of participation.
D. Level D - Six years or more of participation.

Additions to Complete Monitored Herd:

A. Additions may originate from herds of equal or higher status with no change in the status of the receiving herd.
B. Additions may originate from herds of lower status with the receiving herd acquiring the lower status of the herd(s) involved.

APPENDIX F: Media Response Plan

A deer tissue sample tests positive for CWD in Texas, then the TPWD and TAHC officials have only a few hours to manage communication before news reaches the public section.

Prior to Trigger Event, these items are complete and ready to go:

- Step-by-Step Media Response Plan
- Shell of news release announcing CWD find-Draft pending response plan protocols being developed between TPWD and TAHC.
- Identify news media spokespersons with TPWD and TAHC in Austin
    - TAHC: (512) 719-0700. Media Contact: Carla Everett. Spokespersons: Dr. Ken Waldrup, Dr. Max Coates, Dr. Linda Logan, Dr. Dan Baca, and Dr. Terry Conger.
    - TPWD: (512) 389-8900. Media Contact: Steve Lightfoot. Spokespersons: Robert L. Cook, Ron George, Clayton Wolf, and Doug Humphreys

- Web site for news media and general public on CWD. Listings on site include:
- FAQ/Q&A sheet with basic facts on CWD
    - http://www.tpwd.state.tx.us/hunt/chronic_wasting_disease/
- Names/contact info for local/regional experts who can speak about CWD in various regions of Texas.
- Streaming video of CWD educational video on Web for general public.
- Downloadable radio PSAs.
- High-resolution photos and video of animals with CWD.

Actions Needed:

- Gain a clear understanding of Texas operational plan for handling CWD outbreak, including likely sequence of events from initial find to confirmation, and approve policies concerning quarantines, stoppage of intrastate animal movement, and designation of infection zone for monitoring, sampling protocols and possible depopulation plan.
- Effective communication planning hinges on our through understanding of state's plan for dealing with a CWD outbreak.
- Obtain concurrence with media response plan from TAHC and TPWD.
- Make final these above-listed information instruments.

Trigger Event

Notification that a suspected case of CWD exists in Texas.

Notify media contacts at TAHC and TPWD.

- TAHC - Carla Everett, (512) 719-0700 or (800) 550-8242. ceverett@tahc.state.tx.us
- TPWD - Steve Lightfoot, (512) 389-4701 or (512) 565-3680. steve.lightfoot@tpwd.state.tx.us

Actions Needed:

- TAHC and TPWD confirm contacts and alternates, e-mail addresses, cell phone numbers and office and home phone numbers provided to Carla Everett and/or Steve Lightfoot for compilation, coordination and distribution to agency leadership and involved personnel from other entities.
- News release distributed to media, agency(s) personnel and commissioners, affected stakeholder groups and constituents.
- News conference called, depending on level of media response.

Please send comments, suggestions, or questions to:

Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744