

Georgia Surveillance and Response Strategies for Chronic Wasting Disease of Free-Ranging and Captive Cervids

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Charlie Killmaster, State Deer Biologist

Kristina Johannsen, Programs Operations Manager

Definitions:

Active surveillance – Random sampling of apparently healthy cervids, for example, hunter killed, road killed, or those killed to minimize crop damage.

Approved laboratory - A private, State, Federal, or university laboratory approved by USDA APHIS to conduct official tests for CWD in accordance with 9 CFR 55.8.

Captive cervid - Members of the Family Cervidae held within a game-proof perimeter fence or confined area, such as a barn or pen, regardless of whether said cervid(s) may be claimed under private ownership and the purpose for which the cervids are being held.

Cervids - All members of the Family Cervidae and their hybrids. Species in the Family Cervidae include white-tailed deer, mule deer, black-tailed deer, elk, moose, caribou, fallow deer, axis deer, sika deer, and red deer.

Chronic Wasting Disease (CWD) - A transmissible spongiform encephalopathy (TSE) of cervids.

Commingled, Commingling - Animals are commingled if they have direct contact with each other, have less than 10 feet of physical separation, or share equipment, pasture, or water sources/watershed. Animals are considered to have commingled if they have had such contact with a positive animal or contaminated premises within the last 5 years.

CWD response plan – WRD’s management document that describes the coordinated response to a CWD positive finding in a cervid in Georgia.

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

Exposed animal - A cervid of any age having been comingled with a positive animal or contaminated premises during the previous 5 years.

Free-ranging cervid - Members of the Family Cervidae that are not confined by game-proof fencing, but are considered wild, as opposed to captive 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 State.

High-risk Carcass Parts- All cervid carcass parts except boned-out meat, hides, cleaned skull plate with antlers, antlers, and finished taxidermy mounts.

Immunohistochemistry (IHC) - 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.

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

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 - Misfolded proteins which characterize several fatal neurodegenerative diseases in animals and humans.

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

Surveillance - Activities related to the detection of a disease.

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

Transmissible Spongiform Encephalopathy (TSE) – A group of progressive, degenerative brain disorders characterized by microscopic holes thought to be caused by misfolded prion proteins that give the brain a spongy appearance, resulting in impaired brain function and eventually death. This group includes scrapie in sheep and goats, CWD in cervids, bovine spongiform encephalopathy (BSE) in cattle, transmissible mink encephalopathy (TME), 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.

Acronyms:

APHIS - Animal and Plant Health Inspection Service

CDC – Centers for Disease Control and Prevention

CWD - Chronic Wasting Disease

DNR - Department of Natural Resources

DPH – Georgia Department of Public Health

GDA – Georgia Department of Agriculture

GIS - Geographic Information System

GM – Game Management Section of DNR-WRD

LED – Law Enforcement Division of DNR

SCWDS - Southeastern Cooperative Wildlife Disease Study

SEAFWA - Southeastern Association of Fish and Wildlife Agencies

USDA - United States Department of Agriculture

WRD - Wildlife Resources Division of DNR

Links:

www.cdc.gov/prions/cwd

<http://cwg-info.org/>

Introduction

Chronic Wasting Disease (CWD) is a transmissible spongiform encephalopathy (TSE) of cervids, which is invariably fatal once clinical signs are evident. TSEs are caused by self-propagating “prion” proteins (infectious proteins without associated nucleic acids). Prions are misfolded cellular proteins able to induce abnormal folding of other normal cellular proteins in the brain and spinal tissue. This causes brain damage and associated neurological disorder symptoms and ultimately death. Currently, no cases of human disease have been epidemiologically associated with CWD. The U. S. Centers for Disease Control and Prevention (CDC) offers this regarding CWD: “To date, there have been no reported cases of CWD infection in people. However, animal studies suggest CWD poses a risk to some types of non-human primates, like monkeys, that eat meat from CWD-infected animals or come in contact with brain or body fluids from infected deer or elk. These studies raise concerns that there may also be a risk to people.” Additionally, the World Health Organization (WHO) has recommended that it is important to keep the agents of all known prion diseases from entering the human food chain. Like other TSEs, CWD has a long incubation period (~17 months) before clinical signs appear. Characteristic clinical signs include emaciation, droopy ears, incoordination, and excessive salivation, drinking, and urination.

Population level impacts and long-term effects of CWD are currently unknown, however, epidemiologic modeling suggests that these effects could be dramatically negative if the disease is left unmanaged. Despite efforts to limit the geographic spread of the disease, the number of counties within containment zones of Wisconsin, West Virginia, and Virginia continues to increase over time. Surveillance and control programs necessitated by CWD demand additional monetary and personnel resources from wildlife management agencies. Perhaps most ominously, public and agency concerns about potential human health risks associated with CWD, although not proven to cause human disease, may nevertheless undermine participation in hunting, with potentially marked effects on local and state economies, habitat degradation, and the ability of wildlife agencies to manage free-ranging deer herds.

The overarching goal of this plan is to use the latest scientific knowledge and techniques in combination with current state and federal guidelines, policies, and laws to guide the WRD’s response to the discovery of CWD positive cervids within the state. To that end, this document is a living draft, subject to periodic review and revision as new knowledge about CWD is gained by the professional wildlife management and animal health communities. The recommendations defined in this plan are not intended to serve as a strict protocol of action but rather as a guidance document to ensure adequate surveillance, prompt response to a discovery of CWD, and ongoing responsible management actions in the wake of such a finding.

This plan contains two primary objectives: a surveillance strategy and a response strategy. The surveillance strategy is designed to detect the disease using statistically sound sampling procedures. In the event CWD is detected within the state, the response strategy is designed to determine the prevalence and geographic extent of CWD and to prevent further spread. Engagement and education of the public and stakeholders are critical elements of both strategies.

Surveillance Strategy

Efforts by Georgia DNR-WRD are designed to identify CWD in free-ranging and/or captive deer if it occurs within Georgia. The status and spread of the disease regionally and nationally is closely monitored through communication with state and federal wildlife agencies. Special attention may be given if a bordering state identifies a CWD positive animal. This surveillance strategy encompasses two primary methods of sampling for CWD, targeted and active.

I. Targeted Surveillance.

1. Targeted surveillance includes a continuation of current agency procedures pertaining to all cervids displaying multiple clinical symptoms of or similar to those characteristic of CWD, including emaciation, droopy ears, neurological signs such as incoordination, excessive salivation, drinking, and urination. Suspect animals may be submitted whole for necropsy or tissues removed and submitted for CWD testing as appropriate and feasible.
2. Additional measures taken include identifying all high-fence enclosures and captive cervid facilities, continued testing of illegally transported cervids where appropriate, and obtaining and testing samples from the following areas:
 - Captive or free-ranging deer found/harvested in or near high-fence enclosures or captive cervid facilities
 - Illegally transported live cervids

II. Active Surveillance.

1. Active surveillance includes testing hunter-harvested and road-killed deer. This portion of the surveillance plan is accomplished by two disparate sampling techniques, road-killed deer sampling and unequal probabilities random sampling.
 - Road-killed deer sampling
Throughout the state, road-killed deer will be sampled opportunistically when encountered by trained personnel. No confidence level of detection is offered due to the inherent variability in obtaining samples through this method. However, research in CWD positive states has shown that road-killed deer are 17 times more likely to test positive than hunter-killed deer in CWD endemic zones.
 - Unequal probabilities random sampling
Within the state, all counties will be assessed for risk of CWD introduction and placed into one of three categories: Low, Medium, or High. Risk factors for determining the status of each county include the number and type of captive cervid facilities, high-fenced enclosures containing white-tailed deer, known or suspected importation of cervids,

and deer population demographics within county. Sample sizes from these counties may be increased as warranted based on risk factors and logistics of sample collection. Target sample size for Medium-risk counties is 46 (5% prevalence at 90% confidence) and 59 for High-risk counties (5% prevalence at 95% confidence). Data may be pooled across 3 years to reach the desired likelihood of detection. Low risk counties will be sampled under via targeted surveillance.

2. Samples are collected by WRD personnel, GDA personnel, trained seasonal interns, and trained taxidermists (see Appendix E for sampling protocol).
 - Seasonal interns may work primarily during the hunting season and collect samples from hunter-harvested deer obtained through hunt clubs and deer coolers/processors.
 - Taxidermists may be selected from Medium and High-risk counties and trained to collect samples. Nominal compensation for collecting samples may be available, dependent on funding, to ensure accurate sample collection and documentation.

Response Strategy

While CWD has potentially serious consequences, there is currently no evidence that it has been transmitted to humans and/or domestic animals. Consequently, it is important that the response to an outbreak of CWD is in proportion to the health risks and economic impact.

If a CWD-infected cervid is identified in Georgia, or close to the Georgia border, this CWD Response Strategy outlines WRD's management activities to determine the prevalence and geographic extent of the CWD infection and to reduce further geographic spread of CWD. Thus far, CWD management actions in other states have not eradicated CWD from free-ranging deer populations. This plan contains two separate objectives with the course of action determined by the origin of the first diagnosis of CWD, free-ranging or captive cervids. Consequently, this plan is designed with the goals of slowing the spread of the disease and preventing introduction of the disease into new areas by human activity; eradication of free-ranging deer is not suggested or warranted. Regardless of the origin of the first case, the following general response will be taken.

General Response

I. Any positive cervid:

1. Upon receiving notification of the first CWD positive sample from an approved laboratory, WRD will advise the Governor's Office, GDA State Veterinarian and Commissioner, and the DNR Commissioner's office that a preliminary positive case of CWD has been found in Georgia and that back-up samples are being tested for confirmation at a second independent USDA-approved laboratory. Confirmation may take a week or more from the initial positive CWD case notification. If the positive

case is not confirmed (i.e. CWD is “not detected” in the back-up samples), the Governor’s Office, GDA State Veterinarian and Commissioner, and the DNR Commissioner’s office will be notified, and a press release will be sent out immediately. No further action is warranted in this scenario.

2. If the positive case is confirmed by a second independent USDA-approved laboratory, WRD will notify the Governor’s Office, GDA State Veterinarian and Commissioner, the DNR Commissioner’s office, the DPH Commissioner’s office, USDA Area-Veterinarian-In-Charge and USDA Wildlife Services immediately. If back up samples for confirmatory testing are not available, then the case will be considered a true positive.
3. Concurrently, intradepartmental notification will begin proceeding down the divisional chain of command. The GM and LED regional supervisors of the area in which the CWD positive case has been found will be informed of the situation. WRD Public Affairs Office will begin preparing a press release and media information packets.
4. Concurrently, the WRD Director or designees will make calls to key constituency/stakeholder groups, including surrounding Southeastern States, appropriate federal agencies, legislators, and local community officials where the CWD positive case was found, to inform them that CWD has been identified in Georgia.
6. Within 48-72 hours of confirmation of a case within Georgia, the media will be advised of the positive CWD case through a press release from the WRD’s Public Affairs Office. The press release will include media packets providing background information on CWD, a synopsis of Georgia’s CWD surveillance efforts, an outline of likely CWD response management actions, and any other CWD-related materials deemed needed or appropriate. Follow-up media releases will be prepared and disseminated as necessary.
7. A CWD response team (CWDRT) will be assembled under the direction of WRD, to include GDA, USDA, SCWDS and outside experts as needed. WRD personnel shall consist of the WRD Director or designee(s), GM Chief or designee, a LED representative, appropriate regional manager(s) or staff, state deer biologist, and the Public Affairs Director. This team will guide the operational response and will also determine the research and data needs necessary to effectively manage the outbreak. The CWDRT will ensure this research is conducted and incorporated into the management actions. Research projects may be contracted out as deemed appropriate and necessary.
8. The state deer biologist, GM Section chief (or designee), and Public Affairs director will be assigned as GA DNR-WRD CWD media contacts through which all CWD-related questions from the public and the media shall be routed, including public appearances and interviews. These persons will comprise the WRD’s CWD media relations committee.

9. Current statutes (O.C.G.A. §§ 27-1-4, 27-1-5) authorize the promulgation of rules and regulations by the Board of Natural Resources to protect wildlife, the public, and natural resources of this state in the event of a disease outbreak. Additionally, pursuant to O.C.G.A. § 27-1-37, DNR is authorized to issue emergency administrative orders authorizing any appropriate enforcement action (e.g., seizure of wildlife or wild animals) when immediate irreparable injury is likely to occur to wildlife or other natural resources. Emergency rules and regulations necessary to facilitate disease management and prevent or reduce spread will be developed as needed. Feeding or baiting will be immediately prohibited in any county and adjacent county having identified a CWD positive animal pursuant to O.C.G.A. §§ 27-3-9, 27-3-24.
10. Within a month, public information meetings will be held in area of the CWD index case as necessary. Members of the WRD's CWD media relations committee will facilitate these meetings.
11. Make available statewide CWD testing for any hunter-killed deer for a nominal fee.

II. CWD diagnosed in captive cervids.

Actions taken in this portion of the plan will be determined by the species of cervid found to be infected and type of facility involved. The primary objective of the initial CWD response efforts will be to eradicate the disease from the captive herd and to determine if CWD is also present in free-ranging deer surrounding the CWD-infected captive facility. The CWDRT will work in conjunction with the GDA if CWD is diagnosed in a species other than white-tailed deer. Any indemnity, if available, for mandated removal of animals for CWD testing or depopulation shall be declined if any state laws or respective department regulations regarding captive cervids were violated (O.C.G.A. 4-4-72(c)). In the event a CWD-infected captive deer is identified, the following measures will be implemented as rapidly as possible:

1. Captive cervids other than White-tailed Deer.
 - a. Captive cervids at any positive facility may be seized under an Emergency Administrative Order (see Appendix for draft EAO) by the Commissioner of DNR (O.C.G.A. 27-1-37).
 - b. The CWDRT will conduct complete epidemiological investigations to determine the source of disease, population exposed, and population infected.
 - c. Under applicable statutory and regulatory authority provided by emergency regulations, depopulate all cervids from the facility where the infected animal was discovered.
 - Obtain complete inventory of animals pre- and post-depopulation.
 - Quarantine the facility from any TSE susceptible livestock and cervids for a period of 7 years.

- Upon depopulation, ID and test all animals greater than 6 months of age for CWD at necropsy.
 - Carcasses will be disposed of in compliance with all Federal, State, and local regulations. Incineration, alkaline digestion, disposal in an appropriate landfill and burial onsite are the most suitable options. Decontaminate the facility following guidelines outlined in the USDA APHIS CWD Program Standards.
 - Ensure that the entire fence can adequately exclude all free-ranging deer for the duration of the quarantine period.
- d. Trace forward of exposed animals.
- Euthanize exposed animal and test for CWD at necropsy.
 - If the exposed animal is positive, the entire herd will be considered a CWD-suspect herd and shall be depopulated and the facility quarantined following guidelines in section c.
 - If the exposed animal is negative, the facility shall enter a CWD monitoring program pursuant to the Georgia Department of Agriculture Rule 40-13-4-.16 and maintain participation in such program for a period of 7 years. In the event of transfer of ownership of animals or premises, the requirement of participation in the program will be transferred to the subsequent owner.
- e. Trace back of exposed animals. All cervids that tested positive at the original facility shall be traced back to their respective origins. Those facilities and animals, regardless of change in ownership, will then be subject to the following guidelines:
- Quarantine and monitor the facility for a period of 7 years.
 - Regular inspections by state or federal personnel with euthanasia and testing of any suspect animals.
 - Testing of all death losses greater than 6 months of age.
 - If the facility of origin is located outside the state of Georgia, the CWDRT will notify the State Wildlife Agency and any other agency having jurisdiction over captive cervids in the state of origin.
- i. Surveillance in free-ranging deer. A surveillance zone (1-mile radius) will be established from the perimeter of the facility to increase sampling. Depending on deer density, enough samples will be collected from this surveillance zone to determine the presence or absence of CWD in free-ranging deer with 95% probability at 1% prevalence. In the event a free-ranging animal tests positive, Section III of this plan will be implemented.

2. Confined White-tailed Deer.

- a. The CWDRT will conduct complete epidemiological investigations to determine the source of disease, population exposed, and population infected.
- b. Depopulate the herd.
 - Quarantine the facility from any TSE susceptible livestock or cervids for a period of 7 years.
 - Upon depopulation, ID and test all animals greater than 6 months of age for CWD at necropsy.
 - Carcasses shall be disposed of in compliance with all Federal, State, and local regulations. Incineration, alkaline digestion, disposal of materials in appropriate landfills, and burial onsite may be suitable options in accordance with USDA APHIS CWD Program Standards.
 - Decontaminate the facility following USDA APHIS CWD Program Standards.
 - Ensure that the entire fence will exclude all free-ranging deer for the duration of the quarantine period.
- c. Trace forward of exposed animals in the event of translocation.
 - Remove exposed animal and test for CWD.
 - If the exposed animal is positive, the entire herd will be considered positive and shall be depopulated and the facility quarantined following guidelines in section II.1.c.
 - If the exposed animal is negative, the facility shall enter a CWD monitoring program where all death losses greater than 6 months of age will be tested for CWD and maintain participation in such program for as long as white-tailed deer are maintained on the premises. Testing expenses may be borne by the owner, renter, or person in possession of the quarantined facility.
 - If any exposed animals were transported to a location outside the state of Georgia, the CWDRT will notify the appropriate agency of that State.
- d. Trace back of exposed deer in the event of translocation. All deer that tested positive at the original facility shall be traced back to their respective origins. Those facilities will then be subject to the following guidelines.
 - The facility shall enter a CWD monitoring program where all death losses greater than 6 months of age will be tested for CWD and continue participation in such program for as long as white-tailed deer are maintained on the premises.
 - Ensure that the entire fence can exclude all free-ranging deer for the duration of the quarantine period.
 - If the facility of origin is located outside the state of Georgia, the CWDRT will coordinate testing with the appropriate agency of that State.

- e. Surveillance in free-ranging deer. A surveillance zone (1-mile radius) will be established around the facility for active sampling. Depending on deer density, enough samples will be collected from this surveillance zone to determine the presence or absence of CWD in free-ranging deer with 95% probability at 1% prevalence. In the event a free-ranging animal tests positive, Section III of this plan will be implemented.

III. CWD diagnosed in free-ranging White-tailed Deer.

Actions taken in this portion of the plan will be directed at determining the prevalence and geographic extent of CWD infection in the free-ranging deer population and reducing or eliminating further transmission of the disease. In the event a CWD infected free-ranging deer (i.e., the index case) is identified in a state bordering Georgia or within Georgia, the following management actions will be implemented as rapidly as possible:

1. CWD diagnosed in free-ranging deer within 5 miles of the state boundary, but outside Georgia.
 - a. The CWDRT will coordinate testing with the respective State Wildlife Agency in the state where CWD was identified.
 - b. Increased surveillance within a 15-mile radius of known positive deer.
 - Set up sampling check stations and advise public that all deer from that area should be tested and any sick or dead deer reported.
 - Attempt to gain permission to remove and test deer on private land within radius.
 - Identify all high-fence enclosures containing White-tailed Deer within radius and attempt to gain permission to remove and test deer.
 - Identify all captive cervid facilities and attempt to gain permission to test all death losses.
 - Remove and test deer on any public land within radius.
 - Test all road-killed deer within radius.
2. CWD diagnosed within the state of Georgia.
 - a. The CWDRT will set up a 1-mile radius (Zone 1, Index Case) around the index case for intensive sampling and testing to determine prevalence and geographic extent of CWD.
 - Every effort will be made to sample this area through sharpshooting, issuance of special permits to take deer for sampling, and testing road-killed deer.
 - May require testing of all hunter-killed deer from counties within or overlapping the Zone.
 - Test all deer greater than 6 months old taken within Zone where logistically feasible.

- Require that all deer carcasses removed through sharpshooting be incinerated or disposed of in an approved landfill.
 - Recommend that all carcasses with zone be incinerated, disposed of in an approved landfill, or buried under guidance from GDA.
 - Identify, sample, and quarantine any high-fence enclosures containing White-tailed Deer within this area.
 - Prohibit the export of any high-risk carcass parts from counties within or overlapping the Zone.
 - Identify and require that all captive cervid facilities be quarantined, all death losses tested, and any sick animals removed and tested. Obtain a full inventory of animals and require unique identification of all animals.
 - In the event an animal tests positive, the facility will be depopulated and quarantined from all cervids for a period of 7 years.
 - If no animals test positive the facility shall enter a monitoring program outlined in section II.2.c.
- b. The CWDRT will delineate a 5-mile radius (Zone 2, Reduction) around the index case for increased surveillance.
- Attempt to test every road-killed or hunter-harvested deer within this area.
 - Set up sampling check stations and recommend that all deer from that area should be tested and any sick or dead deer reported.
 - Prohibit the export of any high-risk carcass parts from counties within or overlapping the Zone.
 - Work with GDA to make available easy high-risk carcass part disposal options for the public.
 - Identify all high-fence enclosures containing White-tailed Deer within radius and require that all death losses be tested, that a minimum of 5 deer per-square-mile of fenced property be removed and tested, and ensure fence can contain deer.
 - In the event any deer tests positive, the enclosure will be depopulated and quarantined in accordance with Section 2 of this Response Plan (Confined White-tailed Deer).
 - Identify and require that all captive cervid facilities enter a monitoring program where all death losses are tested, and any sick animals are removed and tested.
 - In the event an animal tests positive, the facility will be depopulated and quarantined in accordance with Section 2 of this Response Plan (Confined White-tailed Deer).
 - If no animals test positive the facility shall continue the monitoring program outlined in this section.

- d. Once initial prevalence and geographic extent of CWD are assessed, the respective zones will be realigned along the locations of the outermost positive cases from the index case.

Appendix:

History of CWD Sampling Efforts in Georgia

Prior to the federally funded project in 2002, GA DNR-WRD did not have in place any active surveillance program for the white-tailed deer herd. All prior year sampling efforts were related only to collection and submittal of target animals and any illegal animals removed from private ownership. During 2002, GA DNR-WRD conducted CWD surveillance sampling under a Federal Aid Agreement with the US Fish and Wildlife Service. This surveillance plan was premised with the following assumptions: that CWD was not endemic in the State at any level; that CWD was not endemic in any surrounding state at any level; that introduction into Georgia would therefore likely occur through importation of infected animals from areas where CWD is present; and that such importation would likely be done in conjunction with a high-fence enclosure. Following from these assumptions, GA DNR-WRD proceeded to identify such enclosures where significant animal movement was documented or where very little documentation of activities was available. From this, GA DNR-WRD circumscribed sampling plots with four-mile radii around suspect facilities (i.e. high-fence enclosures). GA DNR-WRD collected samples during this year of the project. All results found that CWD was not detected. During 2003, GA DNR-WRD began sampling through the USDA national CWD program. The USDA protocol did not allow for those (casual) assumptions made during the 2002 sampling program. The sampling protocol was therefore changed to provide a more statistically defensible sampling regime in the absence of the above listed assumptions. During the 2003 program, GA DNR-WRD identified the State's white-tailed deer herd as a single population and sampled accordingly. During the 2003 program samples were collected statewide. All results found that CWD was not detected. From that point until 2011, all sampling was conducted under the USDA protocol when Federal project funding ceased. From 2012 to present, sampling has focused on road-killed deer, sick deer, and hunter-killed deer within elevated risk counties.