Chronic Wasting Disease
Surveillance and Response Plan
2014 - 2019

Virginia Department of Game and Inland Fisheries
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INTRODUCTION

Chronic wasting disease (CWD) is an infectious, progressive, and invariably fatal brain and nervous system disease found in North American deer, elk, and moose. The agent that causes CWD is a small infectious protein called a prion. Species naturally infected include elk, mule deer, white-tailed deer, black-tailed deer, red deer, and moose. CWD is transmitted between animals by direct contact with infectious saliva, urine, and feces, but prions are extremely resistant and may remain infectious in the environment for decades. Once the disease becomes established in an area, environmental contamination likely perpetuates CWD infection in the susceptible cervid population. Effective CWD management relies upon prevention of the establishment of the disease in novel areas. While there is currently no evidence that CWD can be transmitted to humans, the disease poses a serious long-term threat to Virginia's deer population.

The long-term goals of the Virginia Department of Game and Inland Fisheries (VDGIF) CWD Surveillance and Response Plan are to:

1.) Prevent the introduction of CWD into novel areas;
2.) Contain or slow the spread of CWD in known infected areas;
3.) Assess the prevalence of CWD infection in newly infected areas to determine if endemic; and
4.) Determine the distribution and geographic expansion of the disease.

These goals will be accomplished via:

1.) Diligent sampling of high-risk CWD cervids from anywhere in the state, including free-ranging clinical suspects, free-ranging elk, and captive cervids;
2.) Yearly collection of a statistically valid number of samples in newly infected areas;
3.) Yearly collection of samples in endemic areas;
4.) Application of management techniques designed to decrease deer densities and/or rates of infection in known infected areas; and
4.) Prohibition of certain practices (e.g., carcass transport, use of urine-based lures, feeding) known to increase risk of introduction of CWD into novel areas.

BACKGROUND

Following the discovery of CWD in Wisconsin in 2002, VDGIF developed surveillance and response plans for the disease and commenced CWD surveillance in Virginia. Since 2002, VDGIF has tested over 7,500 samples for CWD from wild white-tailed deer, wild elk, and captive deer of several species, with the majority of samples collected from free-ranging white-tailed deer (Table 1). In 2002, 2007, and 2011, VDGIF tested samples from free-ranging white-tailed deer killed by hunters or vehicles from across Virginia. Free-ranging elk in southwest Virginia have been tested since 2001.

Table 1. Summary of CWD samples collected statewide in Virginia by year.

Year	Valid Detected	Valid Not Detected	Total
2013	**2**	437	439
2012	**1**	414	415
2011	**2**	1586	1588
2010	**1**	591	592
2009	**1**	285	286
2008	0	433	433
2007	0	1098	1098
2006	0	899	899
2005	0	700	700
2004	0	90	90
2003	0	32	32
2002	0	1112	1112
2001	0	0	0
Total	**7**	7677	7684

Beginning in 2005, when CWD was first detected in Hampshire County, West Virginia, VDGIF began to focus CWD surveillance in adjacent counties. In 2005 VDGIF established an Active Surveillance Area which consisted of approximately 1,000 square miles of the western and northern portions of Shenandoah, Frederick, Clarke, and Loudoun counties. This area was again used for active surveillance in 2006. In 2007, statewide active surveillance of road and hunter-killed deer was conducted with an emphasis on sampling deer from western Frederick County. In 2008 and 2009, active surveillance was conducted in an area of western Frederick and Shenandoah Counties closest to the positive cases in West Virginia.

Virginia's first case of CWD was a 2.5-year-old female white-tailed deer harvested by a hunter on November 14, 2009, in western Frederick County. Between 2009 and 2013, a total of six positives were diagnosed within approximately 2.5-miles of each other around Virginia's first CWD-positive deer; in 2013, a seventh positive was diagnosed approximately 10 miles southeast of the established cluster. This was a 1.5 year old male deer (Figure 1). Regionally, as of June 1, 2014, CWD has been detected in 162 free-ranging deer from West Virginia, two free-ranging deer from Maryland, three captive deer from Pennsylvania, and five free-ranging deer from Pennsylvania (Figure 2).

In 2007 VDGIF conducted a regional captive cervid CWD qualitative risk assessment as a tool to spatially target active surveillance (Figure 3). This risk assessment was repeated in 2013 (Figure 4). This risk assessment was based on the assumption that areas of Virginia in proximity to concentrations of farmed or captive deer or elk were the highest risk for introduction of CWD into the free-ranging white-tailed deer population. All captive cervid facilities within Virginia and neighboring states (Kentucky, Maryland, North Carolina, Tennessee, and West Virginia) were designated a CWD risk category based on species present, movement histories, and the state's CWD surveillance program for captive cervid facilities.

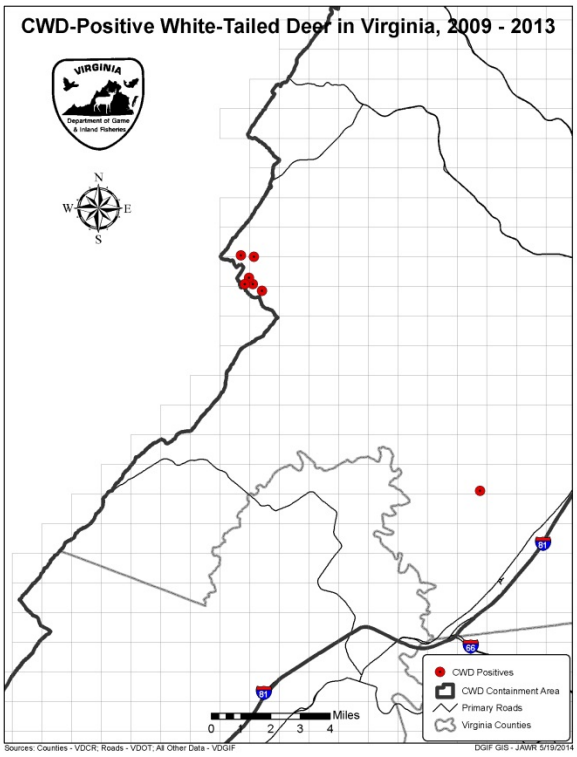

Figure 1. CWD-positive white-tailed deer in Virginia, 2009 – 2013.

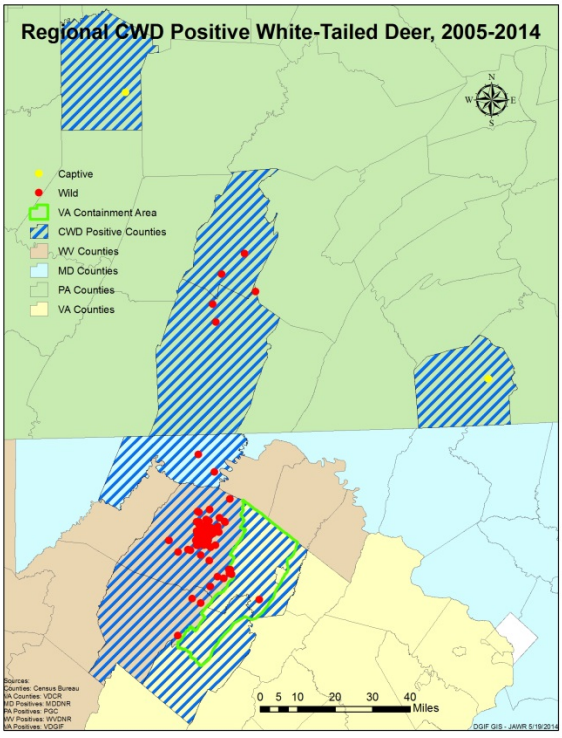

Figure 2. Regional CWD positive white-tailed deer, 2005 – 2014.

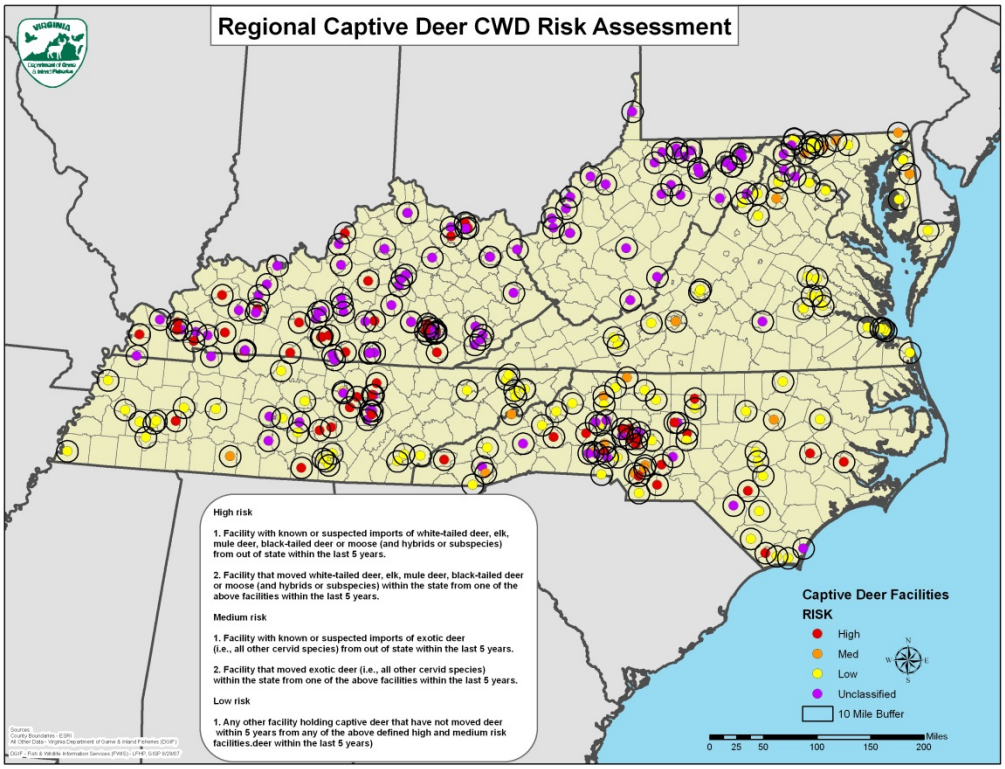

Figure 3. Regional captive cervid CWD risk assessment, 2007.

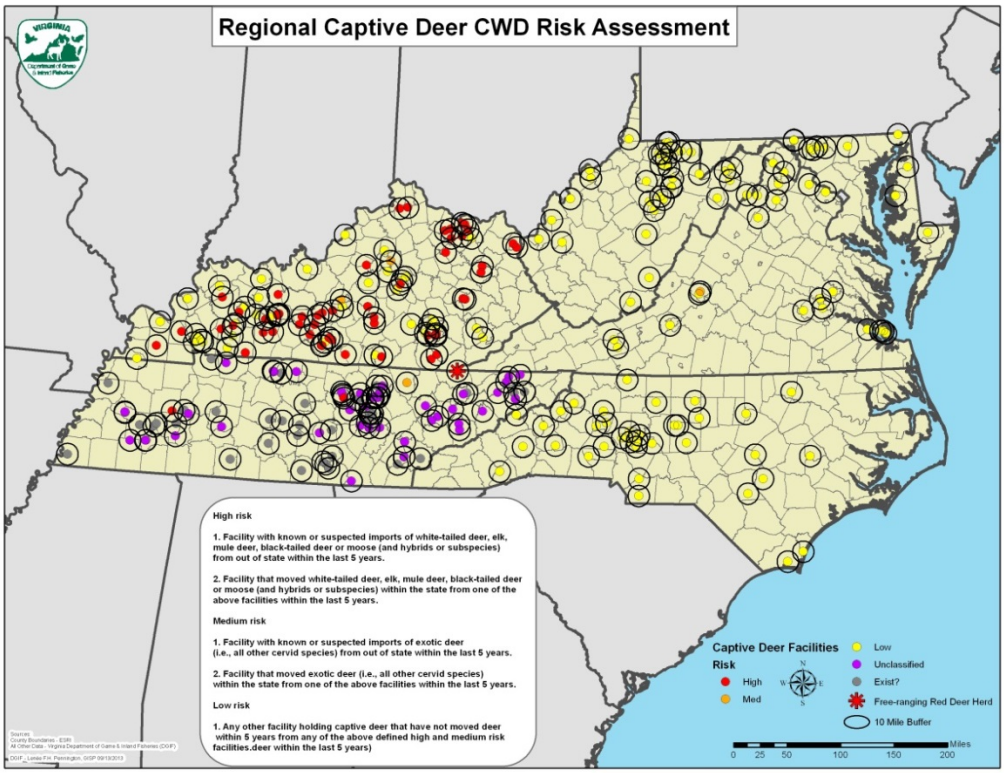

Figure 4. Regional captive cervid CWD risk assessment, 2013.

CWD MANAGEMENT ACTIONS

Due to the detection of CWD in Frederick County in 2009, VDGIF implemented a number of measures to help slow and contain the spread of CWD, effective April 2010. As of 2013, the following measures have been implemented under the Director's authority (per 4VAC-15-20-220) and/or have been incorporated into the appropriate regulations.

1.) Area west of I-81 in Frederick County and the City of Winchester and west of I-81 and north of State Route 675 in Shenandoah County designated as the CWD CA (Figure 5).

2.) Testing of all deer harvested in the CA declared mandatory on the first three Saturdays of the general firearms season at designated CWD check stations.

3.) Feeding of deer prohibited year-round in Frederick, Shenandoah, Clarke, and Warren counties, and in the City of Winchester.

4.) Transport of any deer carcass or deer part that originates within the CA prohibited from leaving the CA, except those parts currently allowed under the carcass importation regulation (4VAC15-90-293) and those carcasses or parts being transported to lined landfills, meat processors, or taxidermists within Frederick or Shenandoah counties. Meat processors, taxidermists, road-kill pickup crews, and waste management service contractors required to dispose of all deer wastes from the CA in a lined landfill in Frederick or Shenandoah counties. Disposal of all unused portions of hunter-killed and permit-killed deer carcasses from the CA in a lined landfill within Frederick or Shenandoah counties or in dumpsters provided by VDGIF or county waste collection sites highly encouraged. Commercial meat processors in Frederick and Shenandoah counties encouraged to process deer individually and keep accurate records.

5.) Rehabilitation and release of any deer from the CA prohibited. Rehabilitated deer in Frederick or Shenandoah counties from outside the CA may only be released in the county of origin.

6.) Increase in the daily bag limit to two either-sex deer during all seasons on private lands in Frederick, Shenandoah, Clarke, and Warren counties, and in the City of Winchester (maintain antlered buck limit of 2 per season). Initiation of the Earn-A-Buck requirement (as currently used in 8 other counties) on private lands in Frederick, Clarke, Warren, and the City of Winchester. All muzzleloading deer seasons established as full season either-sex on private lands in these 4 counties.

7.) Communication plan developed to target key stakeholders and the public to help them understand basic elements of the disease, support the VDGIF's efforts to contain it, remain calm, continue to hunt, and help with surveillance and population reduction was developed.

8.) Establishment of the CWD response management team to guide decisions pertaining to CWD management, containment, and monitoring.

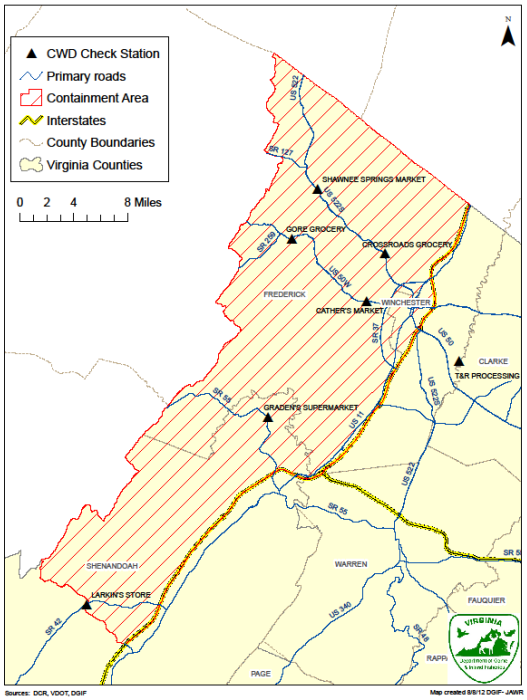

Figure 5. CWD Containment Area, 2010 - 2014.

COMMUNICATION RESPONSE PLANS

Upon receiving notification of any preliminary positive sample, the VDGIF Bureau Director and Deputy Directors will be notified. Immediately thereafter, the CWD response management team will be notified and will expeditiously determine (in consultation with additional external experts, as needed) whether a new case is a new index case or one that it is likely related to existing cases so that notification can proceed either via A1 or A2 below. For the purposes of this plan, an **index case** is a new discovery of CWD that is not reasonably related to existing cases.

A1. General Communication Response Plan for a New Index Case:

1. Upon receiving notification of the first CWD-positive sample of a new index case from a U.S. Department of Agriculture (USDA) approved laboratory, VDGIF will advise the Governor's Office and the Secretary of Natural Resources Office that a preliminary positive case of CWD has been found in a new area of Virginia 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, the Governor's and Secretary's offices will be notified. No further actions will be taken.

2. If the new index case is confirmed by a second independent USDA-approved laboratory, VDGIF will notify the hunter/landowner/facility owner who submitted the sample, Governor's Office, the Secretary of Natural Resources Office, the Virginia Department of Agriculture and Consumer Services (VDACS), the Virginia Department of Health, USDA

Veterinary Services, 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 Deputy Director and Assistant Bureau Director of the Wildlife Resources Bureau for the region in which the CWD index case has been found will be informed of the situation. VDGIF Media Relations will begin preparing a press release.

4. Concurrently, Bureau and Division Directors or their designees will make calls to key constituency/stakeholder groups, including surrounding Mid-Atlantic States, appropriate federal agencies, legislators, and local community officials in the area where the new index case was found.

5. Within 48-72 hours of confirmation of a new index case within Virginia, the media will be advised through a press release from the VDGIF's Richmond Office. The press release will include media packets providing background information on CWD, a synopsis of Virginia's CWD surveillance efforts, an outline of tentative CWD response management actions (likely similar to those taken in Frederick County), and any other CWD-related materials deemed needed or appropriate. Otherwise, media releases will be prepared as necessary.

6. The existing CWD response management team will be augmented with regional biologists and Law Enforcement from the newly diagnosed CWD-positive area. The CWD response management team will continue to include representatives from the Virginia Department of Agriculture and Consumer Services, the United States Department of Agriculture - Animal and Plant Health Inspection Services, , and the Virginia Department of Health, along with VDGIF personnel including, at minimum, the Wildlife Bureau director or designee(s), wildlife veterinarian, law enforcement representation, appropriate regional staff, deer program representation, and the media relations coordinator. This team will guide the operational response and will also determine the research and data needs necessary to effectively manage the outbreak.

7. A limited number of VDGIF staff members (to include a Wildlife Bureau designee, the wildlife veterinarian, and the media relations coordinator) will be assigned as VDGIF CWD media contacts through which all CWD-related questions from the public and the media would be routed, including public appearances and interviews. These persons will comprise the Department's CWD media relations committee.

8. Implement appropriate disease containment measures as allowed by current regulations. Pursuant to VAC 15-40-240 whenever the health or general condition of a species indicates the need for population reduction the director is authorized to issue special permits to obtain the desired reduction by licensed hunters on areas prescribed by VDGIF wildlife biologists. In addition, VAC 15-20-220 provides for the Director to take measures as necessary to control disease outbreaks including, but not limited to, designation of mandatory CWD testing surveillance areas, extended deer seasons and increased bag limits, special designated CWD check stations, prohibition of deer rehabilitation and deer feeding, prohibition of

carcass transportation, and implementation of necessary depopulation and indemnification of captive cervids, fence security and quarantine of cervid facilities.

9. As soon as management actions are finalized, and not later than 3 months following confirmation of the positive case, public meetings will be held in area of the new CWD index case, as necessary.

A2. General Communication Response Plan for Additional Cases Geographically Related to Existing Known Cases:

1. Upon receiving notification of a CWD-positive sample from a U. S. Department of Agriculture (USDA) approved laboratory, VDGIF will send back-up samples to be 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, no further actions will be taken.

2. If the positive case is confirmed by a second independent USDA-approved laboratory, VDGIF will notify the hunter/landowner/facility owner who submitted the sample. If back up samples for confirmatory testing are not available then the case will be considered a true positive.

3. Intradepartmental notification will begin proceeding down the Bureau chain of command. The Deputy Director and Assistant Bureau Director of the Wildlife Resources Bureau for the region in which the CW- positive case has been found will be informed of the situation.

4. Notification of key state officials (e.g., Governor's office) and key stakeholders may be postponed until after test results for all samples collected within the season have been received. Under some circumstances (e.g., when a press release will be prepared), these contacts can be made per A1.2 and A1.4 above.

5. Following confirmation of an additional positive case(s), or after test results for all samples collected within the season have been received, the media will be advised of the positive CWD case(s) through a press release from the VDGIF's Richmond Office. The press release will provide information on Virginia's ongoing CWD surveillance and management efforts. Otherwise, media releases will be prepared as necessary.

6. The CWD response management team assembled following discovery of the index case (as outlined in A1.6) will continue to guide the operational response. Members may be added or removed, as needed.

7. The Department's CWD media relations committee assembled following discovery of the index case (as outlined in section A1.7) will continue to cover media contacts.

8. Appropriate disease management measures will be continued or expanded, as determined by the CWD response management team.

9. Although public meetings may not be necessary following the discovery of each new positive case, the existence of any additional case(s) and its implications will be addressed in any public meetings or outreach efforts going forward.

FIELD RESPONSE PLANS

Definitions:

Containment Area (CA): Area where CWD has been confirmed in the wild deer population and management actions, such liberalized seasons, deer rehabilitation restrictions, and/or carcass export restrictions, have been instituted. Borders of the CA are determined by the CWD response management team.

Surveillance Area (SA): Area encompassing at least a 15-mile radius circle drawn around the location of each CWD-positive deer. SA includes all Prevalence Areas plus at least a 10-mile buffer around the Prevalence Areas. SA may or may not have the same borders as the CA.

Prevalence Area (PA): 5-mile radius circle drawn around the location of each CWD-positive deer. Prevalence of infection in the PA will be assessed each year until CWD is determined to be endemic in the wild deer population.

Endemic Area (EA): Area where CWD is determined to be established in the wild deer population, based on a review of cumulative prevalence and distribution data by the CWD response management team. Borders of the EA are determined by the CWD response management team.

B1. Field Response Plan for Free-Ranging Cervids:

In the event a new CWD index case is identified in Virginia, the following management actions will be implemented as rapidly as possible:

1. Geographic Information Systems (GIS) will be used to map the exact location of the index case. A five-mile radius circle (79-mi^2 area) will be drawn around the index case (Figure 6) to delineate a PA. If a portion of the PA encompasses another state, an interstate PA will be established. A larger CA (management actions instituted within) and SA (yearly collection of samples within) will be delineated around the PA. The SA will be overlaid with a square mile grid to ensure adequate sample resolution for hunter-killed deer (Figure 7).

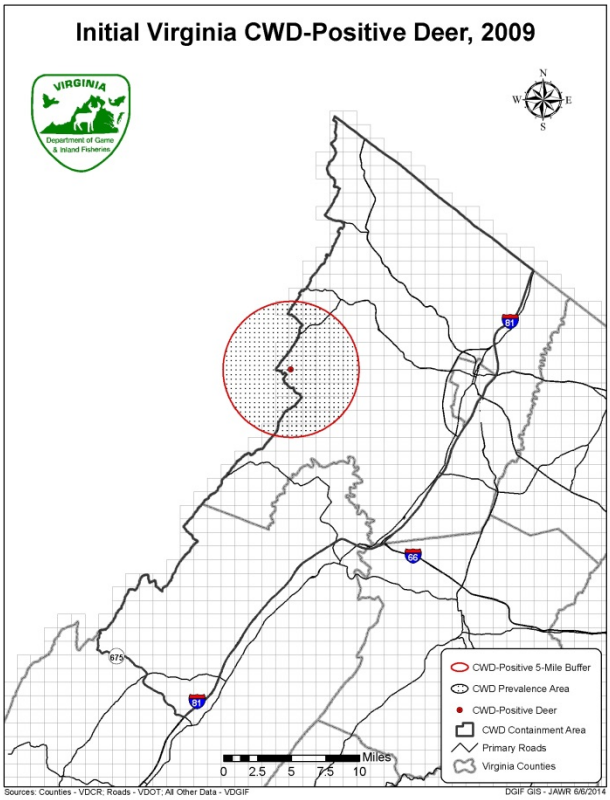

Figure 6. Initial Virginia CWD-positive deer, 2009.

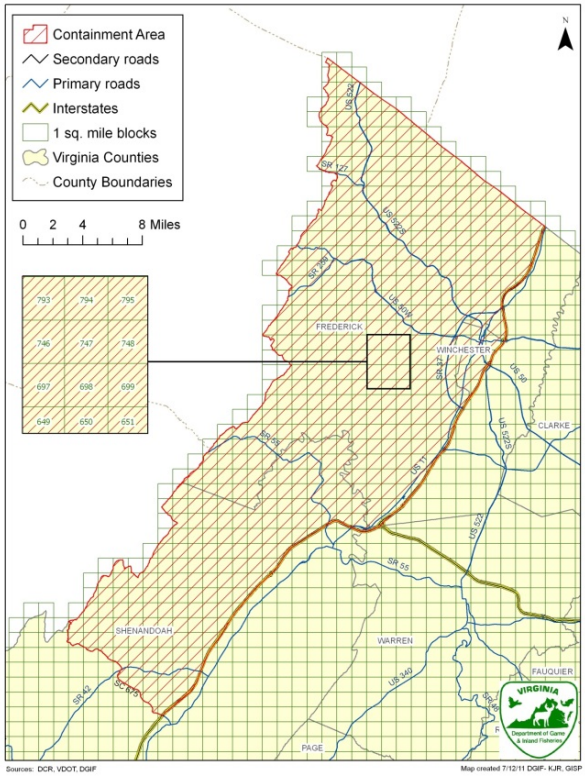

Figure 7. One-square mile grid in CWD Containment Area.

2. Current regulations (VAC 15-20-220) allow for the Director to take appropriate disease containment measures to control disease outbreaks. These measures, which include the prohibition of deer rehabilitation, deer feeding, and carcass transportation out of the CA, shall be enacted immediately upon discovery of an index CWD positive.

3. Within 60 days of confirmed diagnosis of a new CWD index case in Virginia, VDGIF staff will determine the number of samples collected within the CWD PA during the previous 12 months. The assembled CWD response management team will determine when and how additional samples will be collected in order to assess prevalence of infection and geographic distribution of the disease, so long as the target sample size is reached within 12 months of the initial positive. If the next hunting season is to commence in six months or less, hunting opportunities and hunter-harvested deer may be used as the primary means of assessing CWD prevalence and geographic distribution. If there are more than six months between the discovery of an index CWD positive wild deer and the next hunting season, the CWD response management team may assess disease prevalence and geographic distribution through the use of any or all of the following methods to supplement samples expected to be collected during the following season: designating special hunts, issuance of landowner shooting permits or damage permits, collection of road-killed deer, and agency-directed culling, in addition to opportunistic and targeted surveillance. These efforts will likely be followed up by liberalized hunting opportunities and active hunter-harvested surveillance (i.e., mandatory sampling of deer harvested within the SA or portions of the SA on specific days) during the next fall hunting season. Sample size (n = 54) will be sufficient to estimate prevalence with an error of +/- 5% at 90% confidence (active surveillance samples shall be from deer greater than 16 months of age, clinical suspect samples shall be from deer greater than 6 months of age). Although the prevalence rate would still be unknown, the target sample size of n = 54 is based on an expected prevalence rate of 5% in the CWD PA.

4. During the first hunting season following a new CWD index case in Virginia, VDGIF will collect a statistically valid number of samples from the SA. The borders of the SA may extend beyond the borders of the CA. Based on the most current estimate of prevalence (i.e., from the initial sampling or an estimate from previous years), annual sample size shall be sufficient to estimate prevalence with an error of +/- 2% at 90% confidence, if feasible. The sample size ($n \geq 230$), outside the PA but within the SA, will be large enough to result in at least 90% confidence that CWD will be detected if the prevalence of the disease is $\geq$ 1%. Sample size may be obtained via mandatory sampling of all free-ranging deer $\geq$ 16 months of age killed by hunters on specific days within the SA, assistance of Deer Management Assistance Program cooperators, sharp-shooting, collection of road-killed deer, assistance from local taxidermists and processors, and/or issuance of damage permits.

    a. Deer heads will be collected by VDGIF personnel or their designees, samples taken (i.e., medial retropharyngeal lymph nodes) by VDGIF personnel at Department facilities or directly at the check station, and tested by immunohistochemical methods (IHC) or Enzyme Linked Immunosorbent Assay (ELISA) at a USDA-approved laboratory.

b. All unused tissues will be disposed of in licensed lined landfills; sites to be determined in consultation with the Virginia Department of Environmental Quality or incinerated at a VDACS laboratory.

5. Additional PAs will be established for all subsequent CWD cases, and relatedness of new CWD positives to the index case will be determined by the CWD response management team.

6. The CA will be extended as necessary to ensure 5-mile radius from all CWD-positive cases, per the recommendation of the CWD response management team. A positive detected outside of the CA will result in the extension of the CA if the case is reasonably related to existing known cases, per the recommendation of the CWD response team. If the new case appears to be a new introduction of CWD in Virginia, it will be considered a new index case and actions under sections A1 and B1 will be implemented.

7. Yearly CWD testing will be continued in the SA for a minimum of two years or until it is determined that the disease is endemic. Sample sizes in the PA shall be sufficient to estimate prevalence with an error of +/- 2% at 90% confidence. The sample size (n>230), outside the PA but within the SA, will be large enough to result in at least 90% confidence that CWD will be detected if the prevalence of the disease is > 1%.

   a. Factors to be considered to determine if CWD is endemic in a particular area include the following: combined prevalence (combined prevalence greater than 5% may suggest the disease is endemic), increasing or stable yearly prevalence (sustained prevalence of 2.5% or greater), increase in geographic distribution of the disease (multiple CWD-positive cases diagnosed within 5- to 10-miles from each other), or the combined or yearly prevalence and change in geographic distribution in a neighboring state if an interstate PA has been established.

8. Once the disease is determined by the CWD response management team to be endemic in a particular area of the CA, that specific area of the CA will be considered a CWD Endemic Area (EA). Sampling should then shift to reflect greater emphasis on monitoring the geographic distribution of the disease versus monitoring the change in prevalence of infection in the EA. This may be done by shifting sample focus to the remainder of the SA outside the newly delineated EA; however, a statistically valid number of samples should be collected from the EA at least every three years or a 3-year aggregate sample may be used to achieve targeted precision and sample sizes. Sample sizes for determining prevalence in the EA shall require sufficient precision for proportional standard errors to be < 25% or an error bound that is +/- 2% at 90% confidence, whichever requires the smaller sample size, where,

   Proportional standard error = (SE/prevalence estimate)*100.

   Geographically expanded surveillance may be accomplished by rotating sample focus each year to maximize sample effort and track geographic distribution of the disease in the SA as accurately as possible, yet continuing to monitor prevalence in the EA on a rotating schedule.

Alternatively, geographically expanded surveillance may be accomplished by shifting annual surveillance effort to the portions of the SA outside the EA or by enlisting the assistance of local road-kill contractors, taxidermists, and processors. Sample collection in the EA may be enhanced if focus shifts to the remainder of the SA outside the EA via enlisting the assistance of local road-kill contractors, taxidermists, processors, and Deer Management Assistance Program cooperators, and the issuance of damage permits. Management actions and CWD regulations previously established for the CA will remain in effect if yearly sampling is discontinued in the EA.

a. If neither prevalence nor spatial data clearly suggest that CWD is endemic to any portion of the SA after five years of sampling, then the sampling scheme will continue unchanged in the SA. The prevalence and spatial data will be examined each year thereafter to assess the state of CWD in the SA.

9. If no additional CWD-infected free-ranging deer are found in the CWD SA during at least five consecutive years of CWD testing of a subset of hunter-killed deer, the CWD response management team will reevaluate the risk and determine if continued monitoring in the SA is necessary.

10. Multiple management tools may be applied to minimize CWD spread including, but not limited to, deer population reduction and measures outlined in Section A1.8. Some of these measures may be applied to geographic areas outside the CA, per the recommendation of the CWD response management team. Adaptive management will be used to modify techniques based on evaluation of management actions and new information as it emerges. The CWD response management team will be responsible for determining tools that will be applied as well as evaluating management actions.

11. If captive deer facilities (e.g., exhibitors, etc.) are present within the CWD CA, they will be inspected as soon as possible following confirmation of CWD and then every six months by VDGIF personnel. Per current requirements, all captive cervids $\geq$ 6 months of age that die will be tested for CWD. VDGIF personnel will check the integrity of the perimeter fence every 6 months.

B2. Field Response Plan for Captive Deer:

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 the free-ranging deer surrounding the CWD-infected captive deer facility. In the event a CWD-infected captive deer is identified, the following measures will be implemented as rapidly as possible:

1. Quarantine the facility for a minimum of five years.

2. Under applicable statutory and regulatory authority provided by emergency regulations, and if federal or state funds are available for indemnification or the cervid facility owner volunteers to depopulate in the absence of indemnification, depopulate all cervids from the facility. Cervid depopulation of the entire premises is the preferred method of response.

a. If indemnity funds are not available, and the captive cervid facility owner does not voluntarily depopulate, develop a herd plan that also includes a premises plan. Herd/premises plan shall include cleaning and disinfecting procedures, future land use plans in terms of restocking, provision of and maintenance of fencing to prohibit access by wild cervids, and the time period for and testing requirements of surveillance.

2. Modify or augment the fence surrounding the facility to exclude free-ranging native deer. Costs associated with fencing improvements will be the responsibility of the owner of the captive deer facility. If fencing construction is undertaken by VDGIF, the Department may seek reimbursement for the costs of improving fencing, so long as the amount of the reimbursement is not tantamount to taking the property itself.

3. Decontaminate the facility to the maximum extent possible following the USDA-APHIS guidelines. Costs associated with decontamination will be the responsibility of the owner of the captive deer facility. If decontamination procedures are undertaken by VDGIF, the Department may seek reimbursement for the costs of decontamination, so long as the amount of the reimbursement is not tantamount to taking the property itself.

4. Conduct trace-back and trace-forward epidemiological investigations to determine potential exposure between the known positive cervid and other susceptible cervids.

   a. Trace-forward herds – removal and testing of the exposed animal if indemnity available or owner volunteers:
      If an exposed animal is positive, then the entire herd is considered positive.
      If an exposed animal is negative, routine surveillance (test of death losses over twelve months of age) shall continue for 60 months.

   b. Trace-back herds:
      Quarantine herd for 60 months from the last case traced back to herd.
      Herd surveillance (CWD testing of all age cerivds) shall be conducted during the quarantine.

5. For depopulated herds, prohibit re-population of facility with any species of cervid. Facility will be released from quarantine only once an agreement with VDGIF and the owner stating that the facility will only be utilized for non-cervid species has been reached.

6. Implement the management actions described in section B1 around the captive facility.

B3. Field Response Plan for Discovery of CWD within 50 miles of Virginia Border:

1. Upon confirmation of a new index case in a neighboring state within 50 miles of the Virginia border, VDGIF will notify appropriate parties using means identified in section A (“General Response”) above.

2. All Virginia counties that are partially or wholly included within the 50-mile radius of an index case in a neighboring state will be considered at elevated risk and enhanced surveillance will be initiated per the CWD response management team's recommendations.

3. Emergency regulations and policies as described in A1.8 will be initiated by VDGIF as necessary; e.g., prohibition of carcass transportation, deer rehabilitation, deer feeding, and the designation of CWD testing SA(s).

4. If CWD is known to exist within 5 miles of the Virginia border, either inside or outside of Virginia, VDGIF will coordinate with the neighboring state's wildlife agency to define and establish an appropriate interstate PA. VDGIF's objective will be to achieve a statistically valid number of samples to estimate prevalence for the interstate PA per B1.3 and B1.4.

SURVEILLANCE PLANS

C1. Targeted Surveillance Plan for Statewide Free-Ranging Clinical Suspects:

Statewide targeted surveillance of free-ranging CWD clinical suspects will be performed as they are reported and if they are accessible. CWD clinical suspect deer are defined as deer that are 6 months or older, are emaciated, and those that have neurological signs consistent with CWD including, but not limited to, abnormal behavior, increased salivation, tremors, stumbling, ataxia, difficulty swallowing, excessive thirst and excessive urination. Regional staff are encouraged to respond to all calls regarding these deer, and information campaigns for the general public and hunters should be conducted to encourage the reporting of deer with clinical signs consistent with CWD. Brochures and posters are available that can be used for this purpose.

C2. Targeted Surveillance Plan for Free-Ranging Elk in Southwest Virginia:

VDGIF considers free-ranging elk to be a target population, and active surveillance of road and hunter-killed elk as well as targeted surveillance of clinical suspects (see definition above) will continue. All elk mortalities shall be tested for CWD via collection of both retropharyngeal lymph nodes and obex.

C3. Active Surveillance Plan for Statewide Captive Cervids:

The Department currently considers all captive cervid species to be high-risk for CWD infection. Therefore, all captive cervid mortalities over 6 months of age shall be tested for CWD. The cervid owner is required to submit the head to VDGIF staff or a Virginia Department of Agriculture and Consumer Services laboratory within 48 hours of death. In addition, cervid owners are required to inform VDGIF of any animals showing clinical signs consistent with CWD (see definition above). In consultation with a VDGIF Deer Project Coordinator or the VDGIF Wildlife Veterinarian these animals will be humanely dispatched and tested for CWD.

Any wild white-tailed deer that intrude into a captive facility and that cannot be easily and quickly returned to the wild within 24 hours shall be humanely dispatched and tested. Any cervids that escape from a captive facility that cannot be retrieved by the owner will also be

humanely dispatched and tested by VDGIF staff, as appropriate. Illegally imported and/or possessed cervids and cervids within illegal facilities or operations will be humanely dispatched and tested, as appropriate.

There are 4 registered white-tailed deer hunting enclosures in Virginia (see Figure 8). These "grandfathered" facilities enclosed free-ranging native white-tailed deer prior to a 2001 moratorium on such facilities. These facilities are managed pursuant to Department guidelines and annual inspections. While CWD risk associated with these facilities is presumably low, facilities are required to submit for testing all non-hunting mortalities that occur within the enclosures. These facilities have also been requested to submit a small sample of hunter-killed deer for CWD testing, so appropriate regional staff shall continue to coordinate with these facilities for such submissions.

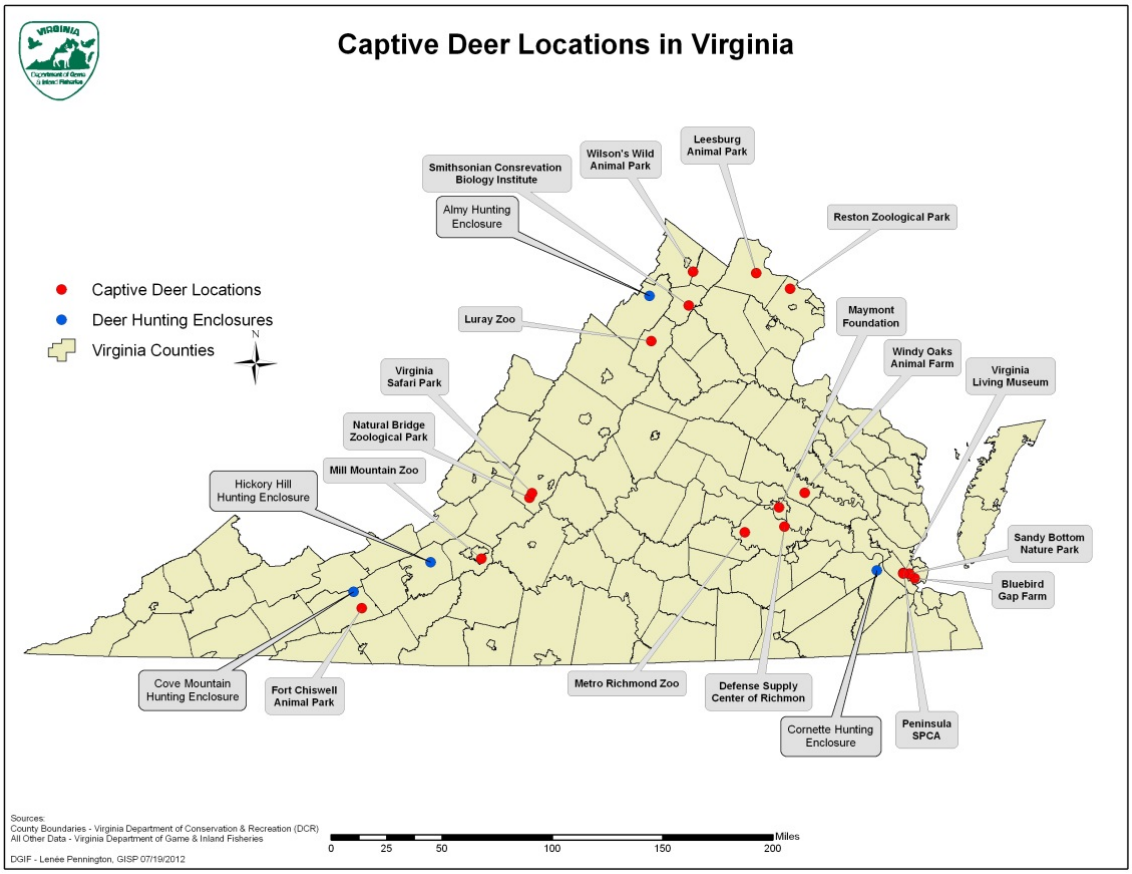

Figure 8. Captive cervid facilities in Virginia.

SAMPLING PROTOCOL

(1) Active Samples - Hunter Killed, Road Killed, Active-Other

a) Only deer older than *16 months* of age should be sampled.

b) Remove and cut both retropharyngeal lymph nodes (RLN) longitudinally (i.e, pole to pole) and place half from each RLN in 10% buffered neutral formalin. *Send to Verona office with data card within 30 days of sample collection.*

c) Place the remaining ½ RLNs in a Whirl Pak for freezing. *Archive in region.*

(2) Targeted Samples - Clinical Suspects

a) Cervids greater than *6 months* of age should be sampled.

b) Remove the obex and place in 10% buffered neutral formalin.

c) Remove and cut both RLNs longitudinally (i.e., pole to pole) and place half from each RLN in the same 10% buffered neutral formalin as the obex. *Send to Verona office with data card within 30 days of sample collection.*

d) Place the remaining ½ RLNs in a Whirl Pak for freezing. *Archive in region.*

(3) Targeted Samples – Free-Ranging Elk and Captive Cervids

a) This includes tame or illegally-possessed white-tailed deer.

b) Cervids greater than *6 months* of age should be sampled.

c) If tagged, record the ear tag number (plastic dangle tag) and/or the USDA number (metal ear tag) on the data card.

d) Remove the obex and place in 10% buffered neutral formalin.

e) Remove and cut both RLNs longitudinally (i.e., pole to pole) and place half from each RLN in the same 10% buffered neutral formalin as the obex. *Send to Verona office with data card within 30 days of sample collection.*

f) Place the remaining ½ RLNs in a whirl pack and freeze for TB testing. *Send to Verona office with data card within 30 days of sample collection.*

g) If tagged, remove ear with tag(s) and place in a Whirl Pak for freezing. Place inWhirl Pak in a sandwich bag. *Archive in region.*

When heads must be removed, use a knife and loppers, leaving about 2-4 inches of the neck. The head should be put in a large Ziploc bag, the air squeezed out, and sealed. This bag containing the head should be put inside a second large Ziploc bag, and sealed (all heads will be double bagged if possible). The data card (inserted and sealed in a Ziploc sandwich bag) should be placed in between these two large bags to keep it dry.

This package (head bagged with the completed data card in a sandwich bag inside) should be refrigerated or put on ice as soon as possible. Refrigerators are located at 10 locations: Region 1, Chesapeake, Hog Island, and Rice Center; Region 2, Farmville and Forest; Region 3, Blacksburg and Marion; Region 4, Ashland, Edinburg, Fredericksburg, and Verona. The heads should be taken to the most convenient location. As long as the head is refrigerated or kept on ice, then the required samples can often be collected as many as 4-5 days later; however, any unnecessary delay should be avoided as sample quality can be compromised.

Permission should be granted from the hunter before sampling a harvested buck. For bucks that require CWD testing, antlers can be cut off individually through the pedicel using loppers or a saw; alterniatively,the antlers with the skullcap may be removed with a saw as long as the brain left below the saw cut is not disturbed. If it is a buck that is going to be mounted at a taxidermist, the head can still be used after it has been caped out and the skullcap has been removed.

It is imperative that samples are collected and labeled appropriately and delivered to Verona within 30 days. If the source of the sample cannot be traced, it will markedly delay CWD control efforts.

Archived samples **must be maintained for 1 year**. These frozen tissues will be stored in regional VDGIF freezers, under the custody of regional terrestrial staff. After 1 year, archived samples may be discarded, along with other biohazards or unneeded chemicals (e.g., expired formalin), at VDACS laboratories.

Cervids that need to be concurrently tested for CWD and rabies shall not have the obex extracted in the field because its removal may negatively affect the rabies testing procedure. The entire head should be submitted intact to a VDACS laboratory and both CWD and rabies testing should be requested.

Personal Protection:

1) Gloves will be worn at all times when collecting and handling tissue samples.
2) The use of goggles or face shields is encouraged.
3) Do not remove the obex from any cervid that is considered a rabies suspect. Take the deer head to the nearest VDACS laboratory for rabies and CWD sample collection.

DATA COLLECTION AND DATABASE AND REPORTING RESULTS

Legibly record as much information on the data card as possible, including name of tissue sampler (not the person who collects the head, if different), date of sampling, species, age, sex of the animal, tag number (if any) and captive facility (if any). It is important to make sure that the Deer ID number on the card corresponds with the samples by using the stickers provided on the card.

The following definitions describe the *origin* and *sample type* to be recorded on the data card:

Active-Hunter killed:	Deer and elk that have been collected as part of random active surveillance that have been killed by hunters.
Active-Road killed:	Deer and elk that have been collected as part of random active surveillance that have been killed by motor vehicles.
Active-Other:	Deer and elk that have been collected as part of random active surveillance that have been killed by other means; for example, kill permits.
Targeted-Clinical suspect:	Cervids that are clinically ill displaying signs consistent with CWD.
Targeted-Other:	Clinically normal cervids that are considered high risk such as captive cervids, free-ranging elk, intrusions into captive facilities, illegally possessed animals, and etc.

Specific location of the deer - in particular, road mile markers or junctions - should be recorded in addition to geographic coordinates (latitude/longitude preferred). Also, the predetermined 1 square mile grid numbers should be recorded on the data card for deer killed in the CA. *Otherwise, the grid numbers blank should not be used.* Comments concerning anything that is unusual or unclear should also be recorded. If the deer is hunter-killed, as much contact information about the hunter as possible should be recorded on the reverse of the card. The bottom part of the data card should be removed along the perforation and given to the hunter. Hunters should be advised that they will be able to check the results on the VDGIF Web site (www3.dgif.virginia.gov/web/cwdresults/) using their initials and one of the following: the Sample ID, big game license number, or check card/confirmation number.

Once data has been entered in the online CWD database (see next page), please send the data card and tissue samples to the Verona office to the attention of "CWD" within 30 days of sample collection.

All data recorded will be maintained on a web-based SQL server database. VDGIF staff will be granted access to the database as necessary. *Regional staff should enter data into the database before sending the data cards and tissue samples to the Verona office.* The database can be located at http://dgifinternal1/cwd/, and staff can obtain access to the database by contacting the Department's Information and Management Services. A manual on how to use the database is available upon request. In order to track submitted samples, information from the data card will be entered into the database directly after collection and given a status of "pending." Upon receipt, conclusive results will be entered, and the status of that sample will change to a "good test". Samples not submitted to the laboratory, for whatever reason, will also be tracked and the reason for rejection will be recorded in the database. Inconclusive results will also be noted and tracked. Using the coordinates or grid number provided, a GIS dataset will be created. This will allow tracking of surveillance efforts and the appropriate response to a positive test result. Updates to this spatial dataset will be delayed by any errors in data recorded or entered, as well as samples that do not contain coordinates or grid numbers.

LABORATORY ANALYSIS

Immunohistochemistry (IHC) or enzyme-linked immunosorbent assay (ELISA) testing will be conducted at a laboratory approved by US Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS) on (1) medial retropharyngeal lymph nodes (RLN) from free-ranging white-tailed deer collected under active surveillance, and on (2) both the RLN and obex for clinical suspect white-tailed deer, hunting enclosures, captive cervids, elk, and all other deer collected under targeted surveillance. If an initial CWD test result is positive, samples will be sent to the National Veterinary Services Laboratory (NVSL), Ames, Iowa, for confirmatory testing.

Valid tests *for white-tailed deer* will be defined as adequate sampling and testing of RLNs. *For all other species*, both the RLNs and obex must be adequately sampled and tested for it to be considered a valid test. All animals that are not adequately sampled and tested will be classified as no test or invalid test.

CONTACT INFORMATION

Dr. Megan Kirchgessner
Wildlife Veterinarian
VA Dept. of Game and Inland Fisheries
2206 South Main Street
Blacksburg, Virginia 24060
C: 804-837-5666
Email: Megan.Kirchgessner@dgif.virginia.gov