

New York State Interagency CWD Risk Minimization Plan

New York State Department of Environmental Conservation

Division of Fish and Wildlife

Division of Law Enforcement

New York State Department of Agriculture and Markets

Division of Animal Industry

Cornell University College of Veterinary Medicine

Animal Health Diagnostic Center

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New York State Interagency CWD Risk Minimization Plan

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Date


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Date

Taking an ecosystem approach also means recognizing the North American deer herds as one and not two entities. While some cooperation exists between regulators of wildlife and livestock, it is clearly insufficient and almost non-existent in some jurisdictions. That cooperation also needs to include both game farmers and hunters, who have the most to lose in the long term. The time for finger pointing is over; the time for an integrated approach has begun.

– P. James 2008
Both Sides of the Fence: A Strategic Review
of Chronic Wasting Disease

Executive Summary

Chronic wasting disease (CWD) represents a serious threat to New York State's wild white-tailed deer and moose populations and captive cervid industry with potentially devastating economic, ecological, and social repercussions. This plan presents recommendations to reasonably minimize the risk of re-entry and spread of chronic wasting disease (CWD) in New York State from an Interagency CWD Team, comprised of New York State Department of Environmental Conservation (DEC) Division of Fish and Wildlife, DEC Division of Law Enforcement, New York State Department of Agriculture and Markets (DAM) Division of Animal Industry, and Cornell University College of Veterinary Medicine Wildlife Health faculty. The legal mandate and agency missions support preventive action as being the only proven management tool for CWD. Reintroduction of CWD into New York State by either captive or wild cervids would have severe consequences for both sides of the fence and therefore, it is critical that both agencies support these preventive measures. Actions were considered based on expert CWD risk assessment, scientific evidence, field surveys, participant knowledge specific to New York, and a desire to develop a plan that both agencies could endorse and implement. The recommendations for actions are based on three overarching goals: 1) keep infectious material and animals out of the state to prevent new introductions; 2) prevent exposure of infectious material to wild white-tailed deer and moose in New York; and 3) provide education to increase the public understanding of CWD risks and impact on wild deer health. This plan provides specific strategies and associated actions for implementation that address regulation changes, field activities, and education plans for both agencies over the next five years.

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Agency Missions

DEC Bureau of Wildlife

To provide the people of New York the opportunity to enjoy all the benefits of the wildlife of the State, now and in the future. This shall be accomplished through scientifically sound management of wildlife species in a manner that is efficient, clearly described, consistent with law, and in harmony with public need.

DEC Division of Law Enforcement

To protect and enhance the environment and natural resources of the State of New York while also protecting the health and safety of its people through the enforcement of Environmental Conservation and related laws and public education.

DAM Division of Animal Industry

To promote sustainable animal production agriculture and the safety of the animal origin food supply. These goals are accomplished through regulatory and cooperative educational efforts with various agencies, both public and private. The Division seeks to detect, control and eradicate communicable diseases in food and fiber producing animals. These diseases cause severe livestock production and economic losses and often pose a significant threat to public health.

Cornell University College of Veterinary Medicine Animal Health Diagnostic Center

To improve the health of food and fiber producing animals, companion animals, sport and recreational animals, exotic animals, and wildlife. These activities protect and improve public health, promote environmental stewardship, and foster economic growth.

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Introduction

Chronic wasting disease (CWD) is an untreatable and fatal disease of deer, elk, reindeer, and moose that poses a serious threat to wild populations nationwide. CWD is caused by abnormally shaped proteins called prions. When a prion enters an organism, it causes existing, healthy proteins to convert into diseased, misfolded proteins. Prions accumulate in tissues of the brain, eyes, tonsils, spleen, lymph nodes, intestinal tract, and spinal cord; eventual disease results in emaciation, disorientation, and death. Prion diseases, such as CWD, scrapie in goats and sheep, mad cow disease in cattle, and Creutzfeldt-Jacob disease in humans are known as "transmissible spongiform encephalopathy" (TSE) diseases. While CWD is similar to these diseases, it is the only TSE that affects free-ranging species. At the present time, CWD is not known to infect deer in New York.

New York State Department of Environmental Conservation (DEC) and New York State Department of Agriculture and Markets (DAM) are committed to preventing the reoccurrence of CWD in New York by identifying a comprehensive list of risks for disease entry and exposure and mitigating those risks. This plan presents the recommendations of an interagency panel to minimize the risk of entry and spread of CWD in New York State. The Interagency CWD Team (Team) was comprised of DEC Division of Fish and Wildlife, DAM Division of Animal Industry, Cornell University College of Veterinary Medicine Wildlife Health faculty, and DEC Division of Law Enforcement. DEC has conducted CWD surveillance since 2002. Beginning in 2011, the Team embarked upon a risk pathways analysis, qualitative risk assessment, and field surveys conducted during on-site visits at taxidermists, deer processors, and captive cervid facilities. Scientific evidence and information on potential risks within New York was systematically gathered by Regional DEC and DAM field staff. A quantitative risk assessment was conducted to prioritize actions. The Team met over the course of several months and crafted recommendations for disease prevention. The suggested courses of action were determined after extensive discussion and represent the best options based on the Team's knowledge of CWD, disease management protocols, the cervid industry, and compliance with existing CWD regulations. These actions apply not only to CWD prevention, but to best management practices for other serious diseases such as tuberculosis and brucellosis.

DEC and DAM released a draft CWD Risk Minimization Plan for public review and comment from August 2 to September 15, 2017. A subgroup of the Team reviewed and assessed the comment that was submitted (Appendix I). As a result of the public feedback, the Team has made the following changes to the final plan:

- Action 1.1.2 –additional assessment will be completed prior to initiating any future action to prohibit the use of cervid urine. DEC will encourage hunters to refrain from using natural cervid urine lures due to CWD risks. Only synthetic products can be guaranteed as CWD free.
- Action 2.3.1 – due to logistical considerations, DEC and DAM will not initially require testing of all CWD-susceptible species that are killed or die in all Special Purpose herds. Rather, DEC and DAM will seek the best approach to significantly increase testing levels and explore the possibility of transferring testing costs to cervid owners.

Problem Statement

Chronic wasting disease continues to pose a serious threat to New York’s white-tailed deer population, deer hunting tradition, and the many other benefits associated with the species. New York has a captive cervid industry that would also be severely impacted if CWD is rediscovered or reintroduced in the state. In the long term, CWD could have many potential consequences, including ecological as the herbivory related to a significantly diminished deer herd could result in changes to plant communities at landscape levels; monetary as funding from unrelated programs is redirected toward CWD response; recreational as hunters’ attitudes toward potentially diseased deer decreases participation, and societal as the public view sick deer and perceive deer as a disease threat to humans. The impact on captive cervid owners would be immediate, with strict limitations on their abilities to move animals and sell products. Additionally, if CWD is discovered in a captive herd, all animals would likely be destroyed and the land quarantined behind a deer-proof fence for at least 5 years. Thus, it is imperative that all reasonable measures be taken to prevent the introduction or spread of CWD in New York.

New York State has CWD regulations in effect, but they are no longer adequate to prevent CWD from re-entry into the state. Revisions are necessary to better reflect recent advances in the science associated with the disease and current status of CWD on the greater landscape ([Figure 1](#)). Consideration of more restrictive regulations related to the movement and management of potentially CWD infected materials is needed now to stop actions and movement of animals that could potentially infect New York’s wild deer and moose herds now and for generations into the future ([Appendix II](#)).

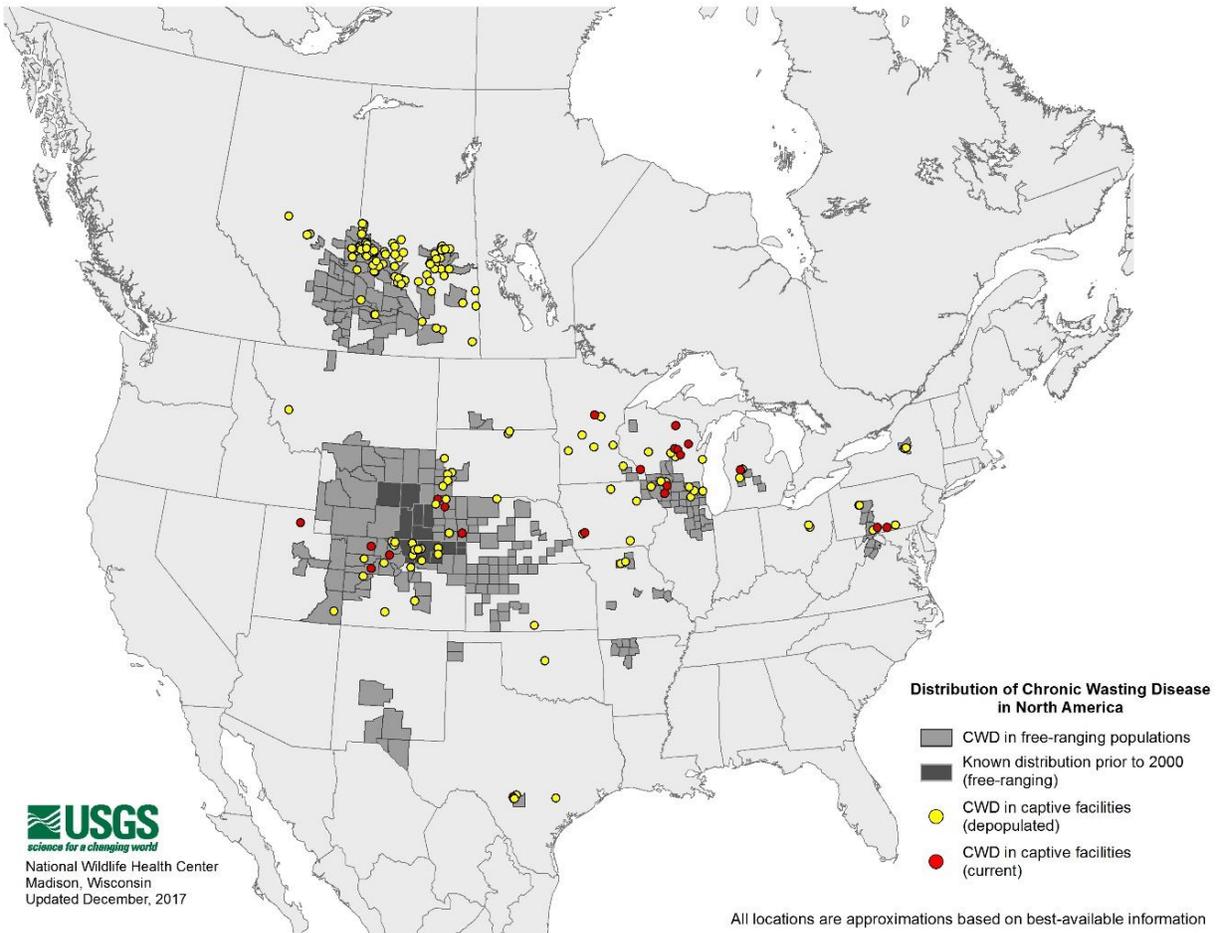


Figure 1. Chronic wasting disease has been detected in 24 states and three Canadian provinces in both captive (n=19 states & provinces) and wild (n= 24) cervid (deer, elk, and moose) species. New York found CWD in both captive and wild white-tailed deer in 2005 with no subsequent detections despite intensive surveillance.

Why is a comprehensive risk minimization plan necessary for New York?

Prevention is the only proven effective method of wildlife disease management. Once a disease is introduced into a wild population, it is extremely difficult and costly to manage or control. New York's experience with the discovery of CWD and subsequent surveillance efforts from 2005 through 2009 highlighted the challenges faced by agencies in collecting adequate samples, enforcing special regulations, and maintaining the long-term public interest and support for the effort. New York is the only state that has not discovered additional cases of CWD after the initial cases were confirmed ([Figure 1](#)). However, scientific information and recent confirmation of CWD in new states indicate that current disease prevention measures and CWD control programs and regulations are inadequate. Because of the nature of the disease and the challenges associated with management, it is necessary and appropriate to take the most cautious approach yielding the most stringent measures possible to minimize the risk of CWD entering the state and exposing both New York's captive cervids and the wild white-tailed deer and moose populations. CWD can be spread by live infected animals, by infected carcasses, parts, urine, feces, blood, and saliva, as well as by plants that have taken up prions from their surfaces or contaminated soil. Prions can remain active for long periods of time under conditions that kill bacteria and viruses. Moreover, recent research involving macaques indicates that oral consumption may transmit disease to the primates. However, this research is not complete at this time and has not been published. Regardless, a comprehensive risk minimization plan, addressing all possible avenues of CWD introduction, is the only effective way to prevent the human-assisted movement of the disease into New York.

Crtl+Click hyperlinks to go directly to Figures or Question & Answer information in Appendix II

Legal Mandate

DEC and DAM have statutory authority for different aspects of CWD, CWD-susceptible animals, the welfare of the wildlife resources of the state and the welfare of the domestic animals of the state. The agencies, particularly in the case of DEC, operates under the Public Trust Doctrine, that administers trust resources (i.e., wildlife) as a valued public resource to be managed by the government for the benefit of the general public, both current and future generations. To ensure this intergenerational fairness, it is the responsibility of the state agencies to ensure that risks to trust resources are avoided until otherwise proven to not be harmful (e.g., precautionary principle, Decker et al. 2016).

The DEC Commissioner, pursuant to the New York State Environmental Conservation Law (ECL) section 3-0301, has the authority to protect the wildlife resources of the state. ECL section 11-0325 (Control of Dangerous Diseases) provides DEC with the authority to take actions necessary to protect wildlife from dangerous diseases. If DEC and DAM jointly determine that a disease, which endangers the health and welfare of wildlife populations, or domestic livestock, exists in any area of the state or is in imminent danger of being introduced into the state, DEC is authorized to adopt measures or regulations necessary to prevent the introduction or spread of such disease. For CWD, DEC has promulgated a Chronic Wasting Disease regulation, 6 New York Codes, Rules, and Regulations (NYCRR) Part 189.

In addition, ECL section 11-1905 provides DEC with authority to regulate the possession, propagation, transportation and sale of captive-bred white-tailed deer. This statute exists because wild white-tailed deer and captive-bred white-tailed deer are the same species.

ECL section 27-0703 (Powers and Duties of the Department; Solid Waste Management Facilities) provides DEC with the authority to regulate the disposal of solid waste including the solid waste generated by businesses such as deer processors (butchers) and taxidermists. DEC solid waste management regulations are contained in 6 NYCRR Part 360.

Agriculture and Markets Law sections 72 and 74 provide the Commissioner of DAM with the authority to take measures to prevent the introduction and spread of, including eradication of, infectious or communicable disease affecting domestic animals or carried by domestic animals and affecting humans. For CWD, DAM has promulgated a regulation entitled Captive Cervid Health Requirements, 1 NYCRR Part 68. This regulation incorporates language for the CWD Herd Certification Program from the USDA-APHIS CWD rule 9 Code of Federal Regulations Part 55.

Background

In spring 2005, CWD was first detected in New York in a captive deer herd in [Oneida County](#). A second infected deer was discovered in a nearby captive herd within days of the index case. Deer had been exchanged between the two herds. Both herds were depopulated and indemnification was paid by DEC. Five captive deer tested positive for CWD. The index herd also had a [taxidermy](#) studio and engaged in the rehabilitation of white-tailed deer; deer may have been exposed to CWD via improperly handled taxidermy waste (salt). Immediate intensive sampling efforts began in a 10-mile radius “containment area” around those herds. Two wild deer tested positive for CWD during that sampling effort. Emergency regulations were subsequently enacted, which included:

- mandatory hunter check stations and testing of all harvested deer from a 23-township containment area;
- bans on: movement of intact carcasses outside the containment area, deer rehabilitation, possession and use of deer or elk urine taken from the containment areas, and possession of a deer killed by a motor vehicle;
- requirements for taxidermist record keeping, reporting, and contact barriers with live cervids.

Within the containment area, surveillance efforts detected no additional CWD-positive wild deer from more than 7,000 deer tested in a five-year period from 2005 - winter 2009/10. The containment area was decommissioned in 2010. Estimated cost to DEC in handling the one disease event in April of 2005 was over \$1 million. The former [Oneida-Madison County CWD containment area](#) may remain a source for future infection because of environmental contamination. DEC has conducted enhanced CWD surveillance in this area each year during the deer hunting season.

More than 49,000 wild white-tailed deer have been tested statewide since 2002 with no new cases of the disease being discovered in New York State since 2005. In 2013, DEC initiated a [risk-based weighted surveillance method for determining CWD testing](#). The new surveillance strategy was informed by the results of an evaluation of potential risks related to CWD introduction and exposure to wild white-tailed deer in New York. County-level sampling quotas are determined based on an analysis of field survey data collected by regional staff, deer population density estimates, and proximity to states with known CWD occurrences. A point system is used for the sampling quotas, in which each deer sampled is given a point value based on its sex and age. This point system encourages the collection of adult deer to increase their representation in the sample. In 2013, DEC also began a program whereby taxidermists collect retropharyngeal lymph nodes to obtain more samples from mature bucks and reduce DEC staff processing time. Adult bucks are valuable samples because they have the highest prevalence rates in states with CWD. This is likely due to their large home ranges and behaviors during the rut. Wild deer reported to be behaving abnormally are targeted for testing as they may be a clinical-suspect for CWD. Each year, DEC necropsies and tests 80-110 clinical suspects. Given the current surveillance system, DEC is able to determine with 95% confidence that if CWD is present in New York’s wild deer herd it is at a prevalence rate of <0.1%. The DAM Captive Cervid Program exceeds the US Department of Agriculture (USDA) CWD Program Standards for CWD certification. Herds not able to meet certification standards are required to conduct annual testing of 10% of their estimated population, up to 30 animals.

Many states and Canadian provinces conduct CWD surveillance in both captive and wild deer herds; however, the long incubation period and varied intensity of disease surveillance among jurisdictions introduce uncertainty that locations which have not identified CWD are actually free of the disease. As a result, an abundance of caution is necessary when dealing with possible CWD introduction from other states and provinces. An [Interagency NYS CWD Response Plan](#) exists to guide agency actions following detection of CWD within New York or [close to the border](#), triggering intensive surveillance efforts in counties adjacent to the neighboring state's disease management area.

In spite of a range of Federal, state, and local laws, regulations, and other measures intended to prevent the spread or reduce CWD prevalence, the disease continues to be identified in new areas annually. Since 2012, CWD has been detected in 30 captive cervid herds across the U.S., including 12 herds that had 5 or more years of disease monitoring prior to detection and nine that were enrolled in USDA programs. Thus, federal CWD standards, and the state CWD programs that mirror federal standards, are effective at eventually detecting disease, but not preventing disease from spreading to new areas.

Economic Costs

Lessons learned from CWD-positive states demonstrate the economic impact of the disease. Wildlife agencies typically take on responsibilities regardless of whether CWD is found in the wild or captive animals. Hunter participation may decline if hunters become disenchanted in pursuing animals that may be infected or worry for their own health (Vaske et al. 2004). Hunting participation in Wisconsin declined by 10%, and other wildlife programs dependent on hunting license dollars, suffered as funding was redirected (Vaske et al. 2004). The estimated value of New York State's wild white-tailed deer herd is just under [\\$1.5 billion per year](#), and the potential economic losses of a 10% decline in hunting participation following the discovery of CWD could be over \$150 million. Recent research that macaques (primates) are susceptible to CWD from consumption of contaminated venison has raised concerns about the risk of transmission to humans. If CWD was found to infect humans, hunting participation is projected to decrease 68%, based on results of a hypothetical question posed to hunters in a multistate survey (Needham et al. 2004). The decrease in license sales and indirect economic contributions from hunters would be significant. The introduction of a uniformly lethal disease causes wild deer populations to decrease over time (Edmunds et al. 2016, DeVivo et al. 2017) so agencies may need to reduce license sales in order to maintain minimum population goals.

With a CWD detection, direct economic expenses from managing the disease in wild or captive population(s) are immediate and substantial for agencies and private individuals. Additional state agencies, outside of wildlife and agriculture, may be also become involved through changes in regulations, staff time, and potential litigation. Wisconsin, which has been managing CWD since 2002, spent more than \$32 million in the first five years of their efforts (Wisconsin Legislative Audit, Nov. 2006) and was unsuccessful in eradicating or stopping the spread of the disease. Missouri reported a nearly 30-fold increase in staff time dedicated to CWD surveillance and response between 2008 and 2017 following detections of CWD in a captive cervid facility in 2010 and subsequent detections in wild deer (J. Sumners pers. comm. 2017). Lawsuits have been filed in several states, such as Missouri and Iowa, around CWD issues in recent years. If a captive cervid facility is found to be infected with CWD,

most states depopulate the herd. USDA has [\\$1M in indemnity funding annually](#), but this amount has been insufficient for depopulation of entire CWD-infected herds. USDA maximum payment per animal is limited to \$3000. There have been 85 CWD-positive captive cervid herds in 16 states as of May 2017 (T. Nichols, pers. comm. 2017). State agriculture or natural resource agencies may decide to pay indemnity (based on animal valuation by an independent appraiser) to the herd owner to cover these animals or apply animal quarantine restrictions. The agencies may also choose to fence the property to exclude wild animals and require a five-year quarantine where no live CWD susceptible cervids can be placed back in the premises. In addition to expenses of handling a disease outbreak for indemnity and loss of land use, there are additional significant costs for carcass disposal and lost revenues from captive-cervid or hunting-related businesses.

Prior to discovery of disease, CWD presents substantial costs as most states conduct some level of surveillance. DEC spends \$300,000 annually to conduct surveillance in wild white-tailed deer given staff time for collection, sampling, testing, and payments to cooperators. In captive animals, DAM currently sends a veterinarian or veterinary technician to facilities that hold CWD-susceptible species in order to collect and submit specimens from mortalities and for routine surveillance testing. Additionally, the cost for testing privately-owned captive cervids is currently paid for by DAM. Other states require cervid owners to pay for the cost of testing, which can reduce owner compliance in reaching the highest level of herd certification. In the past, the USDA CWD Program provided limited but important funding to states to offset the cost of diagnostic testing and indemnification, but this funding is no longer available. Some state wildlife agencies have reduced their wild deer surveillance due to this lack of funding. This may affect a state's ability to detect the disease before it becomes established. In November 2017, H.R. 4454 was introduced to Congress to provide funding to states to develop and implement management strategies, as well as support for applied research regarding the causes and methods to control spread of CWD.

Economic Value of Hunting and the Captive Cervid Industry in New York

Wild deer population and hunting: \$1.50B annually

Direct revenue of Big Game Licenses: \$22.1M¹

Indirect economic input of deer hunting in New York: \$1.47B²

Includes:

\$777.2M in retail sales (\$804.2M total - \$21M license sales)

\$458.1M in salaries & wages

\$123.8M in state & local taxes

\$116.5M in federal taxes

Big Game Hunting License Holders: 574,600¹

Annual additional values – Food and Recreation: \$479.3M

\$57.4M in venison for households (9.59M lbs¹ @ \$6/lb for ground venison)

\$418.3M in recreational value (10,459,000 days hunting² deer @ \$40/day)

Value of Captive Industry: \$13.5M annually³

Direct sales (deer only): \$5.1M

Indirect sales (includes other game): \$8.4M

Estimated number of facilities: 276⁴

Deer and Elk facilities inventory by value: \$4.7M

Employment (labor): \$425,000

Direct full time: 267

Direct part-time: 228

Indirect full-time: 117

Indirect part-time: 100

Comparison of economic values

	WILD DEER (2012)	CAPTIVE CERVIDS (2008)
Direct sales:	\$21.0M	\$5.1M
Indirect Sales:	\$1,475.6M	\$8.4M
Total:	\$1,497.6M	\$13.5M

Sources

¹ NYS Department of Environmental Conservation Automated Licensing System, 2016-17 license year.

² Hunting in America: An Economic Force for Conservation. Produced for the National Shooting Sports Foundation in partnership with the Association of Fish and Wildlife Agencies. Southwick Associates. 2012.

³ The Economic Impact of New York State Deer & Elk Farms. Prepared for the New York Deer & Elk Farmers Association. Shepstone Management Company. 2008.

⁴ New York State Dept. of Agriculture and Markets. 2016 data.

Risk Assessment

Risk is defined as the actual probability and consequence of undesired outcomes. Risk perceptions are defined as intuitive risk judgments and are a byproduct of risk assessment and risk communication (Slovic 1987). Risk perceptions have an element of experience with a particular hazard, which for the public are largely influenced by the media. For CWD, biologists, veterinarians, and administrators are on the forefront of a very complicated issue involving science and public perception. When looking specifically at disease management, strategies are typically aimed at reducing assessed risks determined by characteristics of disease epidemiology and potential consequences of the disease. To assess perceptions among various stakeholder groups of risks for introduction and spread of CWD associated with both wild and captive cervids in New York, Schuler et al. (2016) surveyed biologists and administrators from DEC, veterinarians and administrators from DAM, independent researchers and administrators from state and federal agencies and universities that all have experience with CWD in New York or other states, hunters, and captive cervid owners. The study identified that all groups except captive cervid owners considered any pathway involving interstate import of live cervids as a high risk. Other high risk hazards included CWD undetected in the wild cervid population for more than a year, reduced testing of captive cervids without federal or state subsidies, high wild white-tailed deer herd densities (>10 deer/km²), escaped captive cervids that were not recaptured, fence-line contact from captive to wild cervids, and import of wild deer heads for taxidermy purposes. Captive cervids owners generally ranked hazards lower than the other groups, but were most concerned about importation of wild cervid parts that were then left out on the landscape where they could be encountered by other cervids or scavengers. Expert opinion in a Canadian survey yielded similar results: targeted herd depopulation, natural barriers to wild animal movement, live animal transport bans, double fencing, reducing stray owned cervids, and carcass disposal were likely the most effective options for controlling CWD (Oraby et al. 2016).

For the greater public, the risk perception of wildlife disease varies across gender, education, prior exposure to the disease, and concern for health or economic interests. While CWD is in the same family as “mad cow disease,” it is generally not considered a public health concern. There have been no known cases of CWD in humans; however, the [Centers for Disease Control](#) (CDC) recommends that no one consumes venison from a known positive animal. Recent experiments have shown CWD can be transmitted to macaques (monkeys) that were fed infected meat (muscle tissue) or brain tissue from CWD-infected deer and elk. Some of the meat came from asymptomatic deer that had CWD (i.e. deer that appeared healthy and had not begun to show signs of the illness yet). These experimental studies raise the concern that CWD may pose a risk to people and suggest that it is important to prevent human exposures to CWD. Prions can also be taken up from soil and adsorbed by plant tissues (Pritzkow et al. 2015) of commonly consumed plants such as tomatoes, barley, and wheat; which represent an additional avenue of exposure to humans. Therefore, limiting the geographic distribution of CWD is important. The [Canadian Food Inspection Agency](#) is concerned that moving agricultural products (e.g., cereal grain screenings) is a major risk factor in the spread of CWD. The agency is examining restrictions on the movement of cereal grain screenings within and out of the province of Saskatchewan and parts of southern Alberta where CWD is currently endemic. Further identification or perception of human susceptibility to CWD prions could potentially impact international agricultural trade.

Chronic Wasting Disease Prevention

Considering the economic costs, risks to wild and captive herds, and perceived risks by the public, the Team spent considerable time crafting goals that achieved scientifically appropriate disease prevention actions and educational strategies.

Goals:

- 1. Keep infectious material and animals out of New York to prevent new introductions**
- 2. Prevent exposure of infectious material to CWD-susceptible species in New York if CWD is present and undetected**
- 3. Provide education to increase the public understanding of CWD risks and impact on deer health**

Goal 1: Keep infectious material and animals out of the state to prevent new introductions

Ensuring infective prions do not enter New York State is the highest priority and the best means of disease management. A long-term study of Wyoming white-tailed deer demonstrated that the deer population declined 10% annually in a high prevalence (>30%) endemic area; the authors stressed that the best management strategy remains minimizing movement of CWD to new areas (Edmunds et al. 2016). Based on extensive discussion and evidence from other states, [live captive cervids](#) present the greatest risk for CWD introduction because of extensive captive animal movement (sales and breeding) and the lack of a currently acceptable antemortem (live animal) test. For more than a decade, states have employed CWD certification programs for captive cervids to stop the spread of CWD. Despite these efforts, CWD continues to be detected in states previously thought to be CWD free; since 2010, the first cases of CWD have been documented in Arkansas, Iowa, Maryland, Minnesota, Missouri, Montana, North Dakota, Ohio, Pennsylvania, and Texas.

Species currently known to be susceptible to CWD:

White-tailed deer (*Odocoileus virginianus*)
Mule deer & Black-tailed deer (*O. hemionus*)
Red deer (*Cervus elaphus*)
Elk (*C.e.canadensis*)
Moose (*Alces alces*)
Sika deer (*Cervus nippon*)
Caribou/Reindeer (*Rangifer tarandus*)

Currently, the list of prohibited states continues to grow as each state detects CWD. A 2013 survey of New England states demonstrated surveillance levels that may be insufficient to identify a CWD

outbreak in a timely manner (Appendix III). This lag in detection and public knowledge creates difficulties in enforcement, which is why a ban on import from all states is preferable.

As a result of the continued spread of CWD, DAM revised 1 NYCRR Part 68 to prohibit importation of live CWD-susceptible cervids into New York State, exempting American Zoological Association collections ([Figure 2](#)). The regulation was adopted in October 2013. A hearing was held in March 2017 to determine if the regulation should be amended, repealed, or continued, but official adoption is pending. Germplasm (semen, embryos) has not demonstrated infectivity and would be permitted for import into New York unless future information identifies a risk of transmission. We also have taken steps to ensure that the hunting public is not illegally importing whole (field-dressed) wild cervid carcasses from prohibited states by seizing and destroying improperly processed carcasses, regardless of test results.

Other potential routes of CWD introduction into New York are from CWD-susceptible animal parts and products (e.g., deer urine). A complete import ban from all states regardless of CWD status is recommended on whole cervid carcasses ([Figure 3](#)). Current regulations permit hunters to import whole carcasses of CWD-susceptible cervids from other states until CWD is detected in that state. However, by the time CWD is detected in a state, it may have been in an area for years. Carcass importation associated with hunting activity could move prions to new areas where prions can remain viable for years. There are no disposal requirements prohibiting an individual New York hunter from disposing of his or her deer carcass on his or her property. However, businesses, such as taxidermy or deer processing, are required to dispose of their waste products in a municipal solid waste landfill or at a rendering facility. Thus, a hunter, disposing of the waste from his or her deer, could potentially distribute prions on the landscape if that deer was infected with CWD. Scavengers, such as crows and coyotes, are capable of passing prions through their digestive tract and these remain infectious in feces (Nichols et al. 2015). We encourage all hunters to ensure that their harvested deer carcasses end up in a municipal solid waste landfill whether they are processing their animals at home or using a deer-related business. We may facilitate appropriate carcass disposal by identifying cooperating taxidermists and deer processing business that use municipal landfills for carcass disposal, combined with enforcement efforts for those businesses not following DEC Solid Waste regulation 6A-2 NYCRR Part 360.

Figure 2. Multiple states and provinces restrict captive cervid activities by prohibiting captive white-tailed deer (WTD) or live import from all states or CWD-positive states or areas.

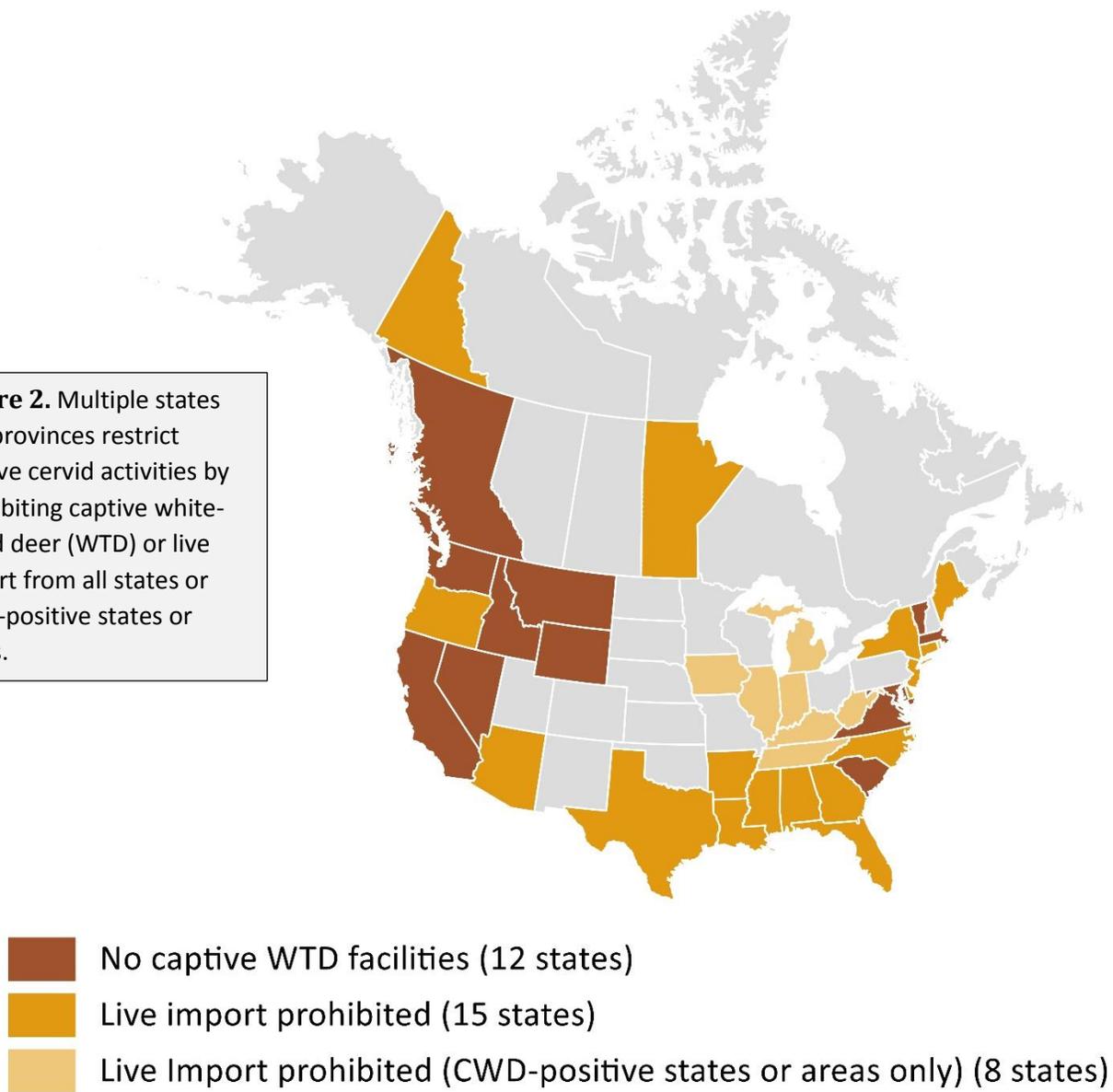
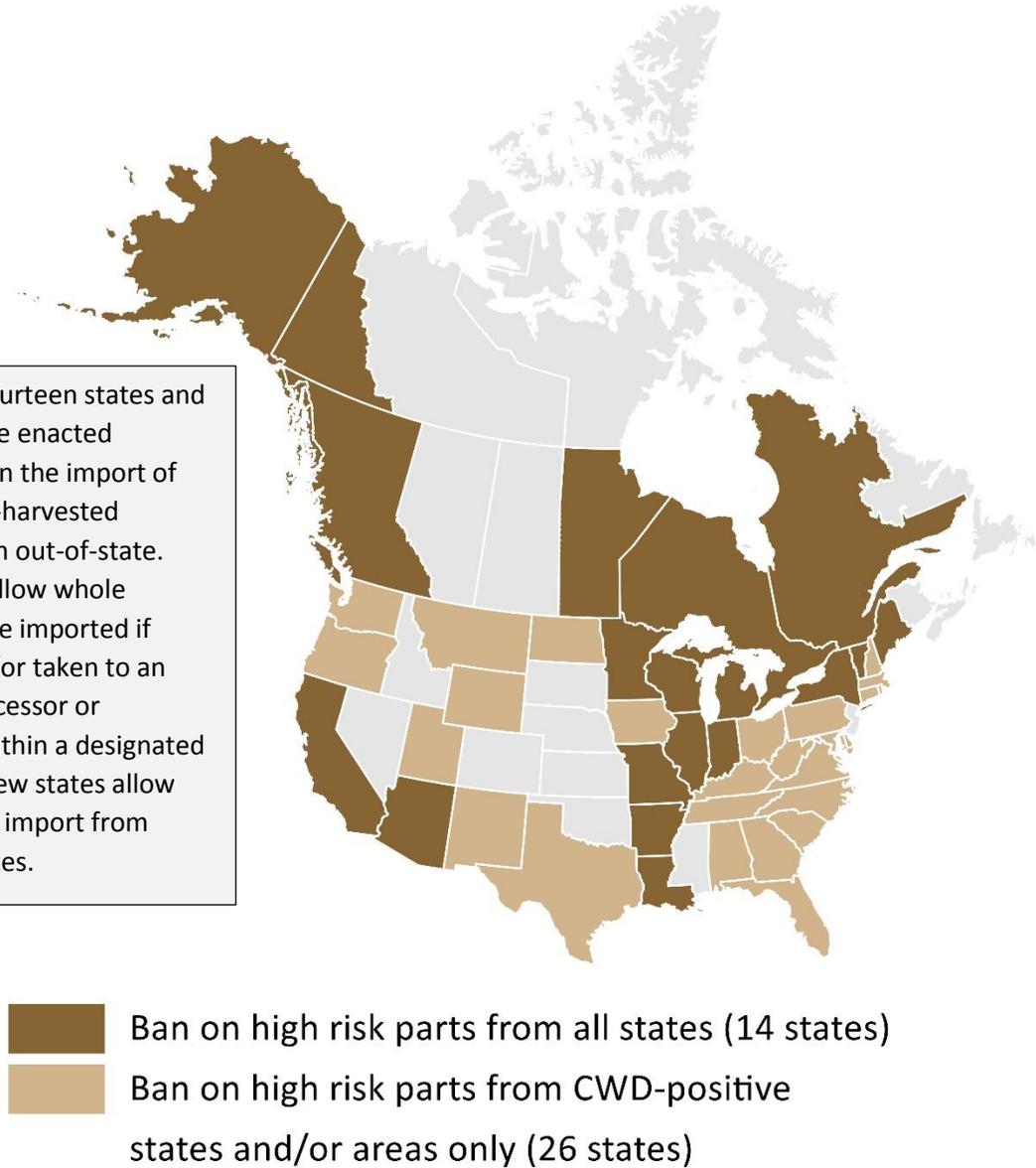


Figure 3. Fourteen states and provinces have enacted prohibitions on the import of whole hunter-harvested carcasses from out-of-state. Some states allow whole carcasses to be imported if reported and/or taken to an approved processor or taxidermist within a designated time limit. A few states allow whole carcass import from bordering states.



While the highest concentrations of prions are found in central nervous tissues and lymphoid organs, CWD-infected cervids also shed prions in smaller quantities in body fluids and tissues. Prions have been detected in saliva, feces, blood, velvet, and urine (Angers et al. 2006, Angers et al. 2009, Henderson et al. 2015, John et al. 2013, Mathiason et al. 2006, Plummer et al. 2017). Most urine sold commercially is collected from captive cervid facilities. It may be batched from several locations and can be distributed across the country via retail, internet, and catalog sales. As previously stated, movement of animals and failures in CWD certification programs indicate that captive cervids present a higher risk for CWD. If natural cervid urine containing prions is put on the landscape by deer hunters, in a scrape or other area

used by cervids, prions may bind to soil and contaminate that location for years or decades. Prions deposited in this manner will have a cumulative effect over time. Plants are capable of binding prions on leaves and taking up prions into their tissues; those prions remain infectious (Pritzkow et al. 2015). Cervids attracted to that location (cervid urine is marketed as a deer or elk attractant) have the potential to then ingest prions and become infected.

Alaska, Vermont, Virginia, and several Canadian provinces have already banned natural cervid urine for hunting because of these risks. There is no “safe” dose of prion; exposure to one prion may be enough to cause infection (Fryer and McLean 2011). Once infected, exposed cervids shed prions into the environment where they can be encountered by unexposed deer. Infected cervids are known to shed prions prior to showing signs of disease. There is currently no rapid, cost effective test to determine if collected urine contains prions (John et al. 2013).

Strategy 1.1: Enhance DEC regulated activities such as to not allow entry of CWD into New York State

- Action 1.1.1: DEC will amend Part 189 to implement a comprehensive ban on importation of certain parts or tissues of hunter-harvested cervids (deer, elk and moose), regardless of origin. Importers shall only import the deboned meat, [cleaned skull cap](#), antlers with no flesh adhering, raw or processed cape or hide, cleaned teeth or lower jaw, and finished taxidermy products.

Advantage: 1. Standardizes regulation to reduce confusion in hunting community and law enforcement because only deboned meat etc. may be imported into New York regardless from the place of origin; 2. Prevents delay in identifying the new states with CWD and prohibiting imports by amending the CWD regulation.

Disadvantage: Increased effort for hunters traveling outside of New York to comply because they cannot import whole carcasses.

- Action 1.1.2: DEC will continue to assess the risk posed by use of products composed of urine and excreted substances from any CWD-susceptible animal as a route for introduction and spread of CWD in New York and propose appropriate steps to address this threat.

Advantage: Allows continued scientific input to the risks of natural deer urine products and the risks for disease transmission associated with their use.

Disadvantage: Allows natural deer urine products to be sold and used without oversight by any agency or organization.

- Action 1.1.3: DEC will amend 6 NYCRR Part 189 to only include a list of known CWD-susceptible species by removing those species that have not been found to be susceptible to CWD.

Advantage: Removing species that are not known to be susceptible from regulation provides regulatory relief without compromising CWD prevention.

Disadvantage: Will require DEC to amend the CWD regulation as new species are found to be CWD susceptible.

Goal 2: Prevent exposure of infectious prions to CWD-susceptible species in New York State if CWD is present but undetected

Though we have no evidence that CWD is currently present in New York, if the disease is present but undetected, numerous measures should be taken to reduce risk of disease amplification and dispersion. Among wild deer and moose, risks are most directly tied to illegal feeding and baiting situations. Also, the mishandling of deer or cervids or products thereof that may be infected with CWD prions, could result in an exposure to wild deer.

Captive cervid facilities pose a high risk of disease entry and spread through the movement of live animals and potential exposure to wild cervids through fence lines or [escapes of captive cervids](#) into the wild (Appendix IV). Because of these risks, the [captive cervid industry](#) should be held to high standards within New York. Numerous states have banned the ownership of captive cervids or specific species ([Figure 2](#)). Likewise, the Team discussed eliminating or reducing captive cervid facilities in New York. However, DAM took a great stride in protecting wild and captive deer by revising 1 NYCRR Part 68 to prohibit importation of live CWD-susceptible cervids into New York State so the Team chose to identify key actions that would further reduce risks to wild and captive cervids.

FEEDING OF WILD DEER: Concentrating any wild species around a food source has the potential to increase spread of infectious disease by direct animal-to-animal contact, aerosol transmission, ingestion of feed contaminated with fluids (i.e., saliva) from another infected animal, or contact with body fluids, such as urine or feces. Similar to CWD, bovine tuberculosis is another disease in white-tailed deer that can be spread more efficiently through supplemental feeding. Novel food sources can lead to other nutritional issues, such as rumenitis and bloat, and death when white-tailed deer consume large quantities. Concentrating deer around feeding sites can cause damage to the habitat through trampling and increased herbivory, as well as increase the incidence of deer vehicle collisions. Species other than deer can visit feeding piles and have similar negative effects. Wildlife accustomed to supplemental feeding can have behavioral changes, such as habituation, that can become a public nuisance. New York State Environmental Conservation Law prohibits feeding deer within 300 feet of a public road and placing salt licks on lands inhabited by deer. Additionally, DEC regulations have prohibited feeding deer and moose statewide since 2002, though recent legal challenges have compromised enforcement. DEC intends to revise the regulation to clarify and strengthen the prohibition and ensure enforceability statewide.

CERVID FACILITIES GOING OUT OF BUSINESS: For those captive cervid owners looking to close their facility, DEC and DAM will implement a coordinated program to eliminate herds without creating a risk of illegal liberation to the wild. Special Purpose or Monitored herds, primarily in use as high fence shooting operations, are those that do not meet [USDA criteria for certification](#), and thus are held under quarantine and cannot move live animals except directly to an approved facility for immediate slaughter. The current national USDA CWD Herd Certification Program has developed minimum standards to prevent the spread of CWD by instituting mandatory testing only on herds that enroll voluntarily. DAM reviewed their regulation [1 NYCRR 68.5 (f)] and determined that it provides a safe, effective and legal course of action for cervid facilities to close their operations. DEC will review Domestic Game Animal Breeder license conditions, and amend if necessary, to ensure that captive white-tailed deer licensees are able to comply with the provisions of DAM protocols for decommissioning a white-tailed deer facility.

DEC REGULATORY ENFORCEMENT AND AGENCY OVERSIGHT: The Team recommends that DEC CWD regulations be amended to streamline enforcement of DAM regulations by DEC Environmental Conservation Officers and that enforcement of these regulations include all instances of any failure to adhere to license conditions including recordkeeping and compliance with CWD testing requirements. DEC law enforcement officers currently possess the authority to enforce DAM regulations pursuant to their status as peace officers provided in the New York State Criminal Procedure Law, but mirroring components of DAM's CWD rules in DEC regulations will allow DEC officers to better address violations and allows the person in violation to handle the matter more efficiently.

DEC will collaborate with DAM on site visits to facilities holding a Domestic Game Animal Breeder License to examine record keeping, conduct a fence inspection to make sure the facility is secure and limits opportunity for contact with wild deer, and provide a herd inventory or estimates. It is the practice of DEC that all escapes of any captive CWD-susceptible cervid species be euthanized unless authorities are informed that the owner is making immediate, ongoing, and substantive efforts to recapture escaped or liberated animals (Appendix IV). DAM and DEC should also institute new standards for traceability including permanent identification for all cervids from birth to death and require biosecurity and herd closure plans for disease containment. The Team discussed numerous options for fencing requirements for captive facilities, but concluded that adding further regulations would not be effective until existing rules were consistently complied with and enforced. In addition, specialized fencing prevents nose-to-nose contact of animals, but it does not prevent movement of infected material through runoff, disposal of waste, scavengers, or mechanical vectors (vehicles and equipment). Captive facilities will be advised to protect their animals from possible CWD introduction via wild deer by using mechanisms to prevent nose-to-nose contact through the fence line by installing electric fence on outriggers, visual barriers, slant fencing, or double-fencing with alleys between.

TESTING REQUIREMENTS FOR CAPTIVE CERVID OPERATIONS: We recommend DAM adopt a more stringent reporting system for any natural death, harvest, or euthanasia of a CWD-susceptible cervid over 12-months of age for both Certified and Special Purpose herds. Immediate reporting will allow samples to be collected for CWD and tuberculosis testing.

Commercial shooting operations enrolled as Special Purpose herds present a greater risk because they frequently bring in adult male deer as “shooter bucks” that are the sex/age class with the highest CWD prevalence rates. These animals may not be tested because only 10% of the herd or up to 30 animals must be tested annually. The herd owner can choose the animals to be tested, thus allowing an unscrupulous owner to avoid testing of suspect animals, even though CWD-clinical suspects must be reported and all natural mortalities are required to be tested. Because of the lack of requirement for a complete herd inventory and identification of all individuals in these herds, animals may die without detection or testing.

Ideally, all carcasses leaving Special Purpose herds would be tested. Currently, all CWD testing of captive cervids is funded by DAM, which may not be feasible with higher sample volumes. DEC will collaborate with DAM to identify a more optimal testing regime, provide assistance in specimen collection, and explore the possibility of holding captive cervid owners financially responsible for testing costs.

WILDLIFE REHABILITATION OF WILD WHITE-TAILED DEER: If CWD is present in or introduced to New York, it likely will be detected in an adult deer through annual surveillance activities rather than in a rehabilitation facility which predominantly handle fawns rather than adults. White-tailed deer fawns or moose calves have potential to be exposed to CWD, but even in infected herds, CWD prevalence in fawns or calves is low. However, moving and concentrating wild deer in confinement at a rehabilitation facility could potentially spread disease to a group of wild deer that would be liberated back into the environment. Another concern is the distance that wild deer are moved to a wildlife rehabilitator (Figure 4). In some cases, the long distance transport of an ‘abandoned fawn’ is facilitated by a misguided but well-meaning attempt by a private citizen. Ideally, all wild deer that are brought to rehabilitators should be accurately recorded and tracked while in rehabilitative care in a manner that allows DEC to do trace-outs if CWD is confirmed in a wild deer that has been in the wildlife rehabilitation system.

Our recommendation is to increase DEC oversight and collaboration with wild deer rehabilitators by developing special license conditions to ensure that wildlife rehabilitators are using best management practices to reduce transmission through exposure, movement, and liberation of potentially diseased animals. Increased DEC oversight of wild deer rehabilitation includes using electronic reporting systems to identify which rehabilitators take in deer. These facilities should be inspected by DEC on a regular basis and meet basic standards outlined by the International Wildlife Rehabilitation Council. One goal is to establish better working relationships with wildlife rehabilitators to facilitate information transfer for all potential disease situations. Deer rehabilitators will be required to provide carcasses or samples for diagnostic testing, and they must report any deer exhibiting clinical signs consistent with CWD (uncoordinated gait or stumbling, drooling, head tilt, emaciation). Fawns should not be overwintered except for those fawns that require continued rehabilitative care. Deer rehabilitators must maintain accurate records for all deer that are handled under the authority of their Wildlife Rehabilitator License including all deer transferred to another rehabilitator, released to the wild, euthanized, or that have died.

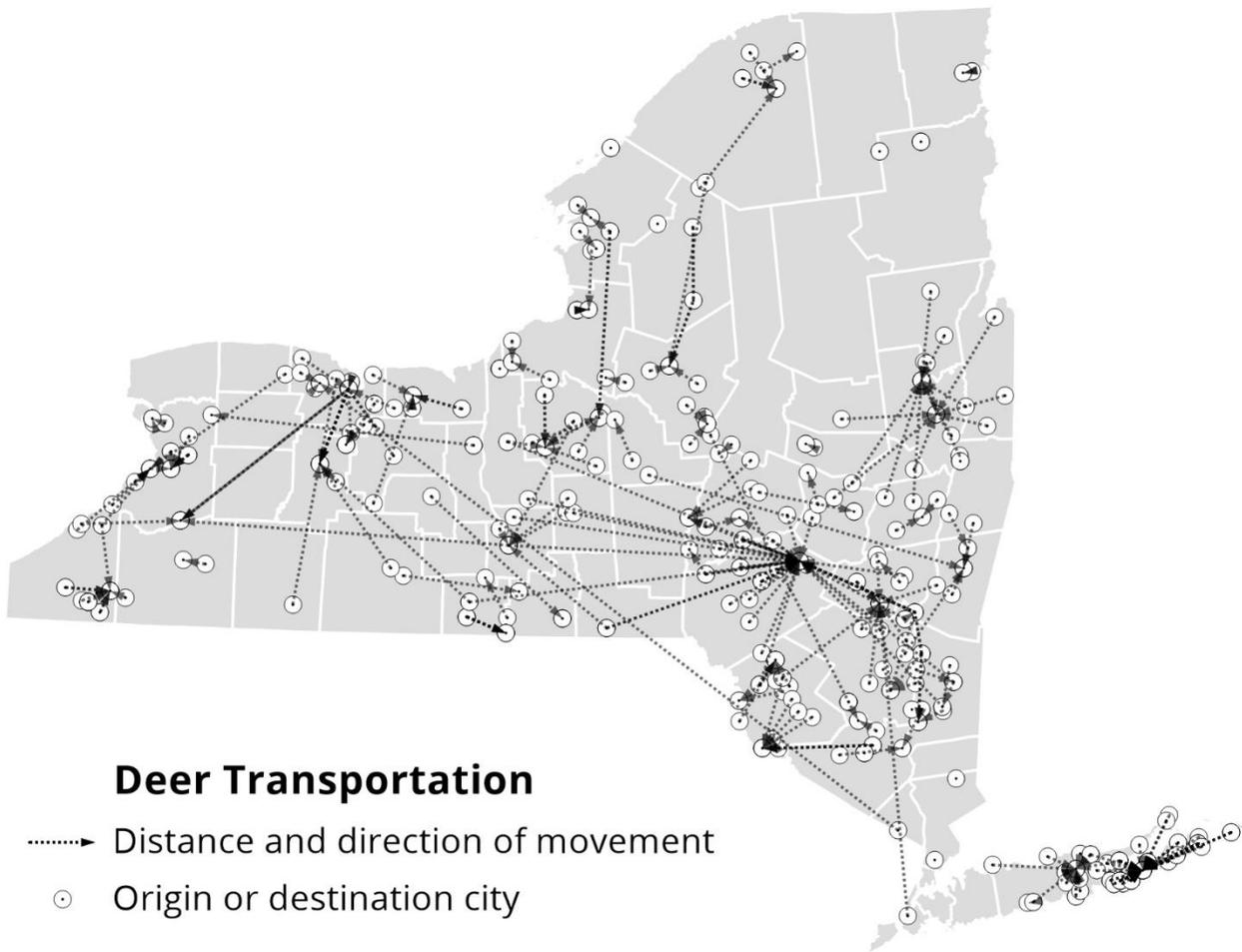


Figure 4. Movement patterns for white-tailed deer taken in by licensed rehabilitators in 2012. Most deer released were young-of-the-year (fawns). Several deer were moved more than 40 miles to a rehabilitation facility. Release locations for deer were not available.

Strategy 2.1. Stop feeding wild white-tailed deer by the public because it presents a variety of ecological and behavioral problems, in addition to increasing infectious disease transmission and nutritional deficiencies.

- Action 2.1.1: DEC will prohibit feeding of wild deer via regulation 6 NYCRR Part 186.

Advantage: Prohibition on feeding will prevent artificial congregation of cervids and associated ecological and disease impacts. Saliva, feces, and urine of CWD infected animals left at feeding sites can serve as a source of environmental contamination that may remain infectious for years. Exemptions to a prohibition on feeding include planting of crops or food plots, feeding associated with livestock husbandry, feeding of legally possessed captive cervids, cutting trees or brush, and use of 4-Poster™ deer treatment devices. Use of 4-Poster™ deer treatment devices to dispense 4-Poster™ Tickicide for control of ticks will be allowed via a permit from DEC as part of a municipality's comprehensive deer management program, but use of 4-poster devices would be curtailed in the event of a disease outbreak.

Disadvantage: Some of the public feels that deer feeding is important and they like to see the deer.

Strategy 2.2. DEC and DAM will collaborate more closely on oversight of captive CWD-susceptible cervid operations

- Action 2.2.1: DEC will amend Part 189 to clearly incorporate DAM CWD regulations to allow DEC Environmental Conservation Officers to better enforce violations of the CWD regulations.

Advantage: 1. Allows ECOs to issue tickets pursuant to provisions of Part 189 where such violations would also be a violation of DAM CWD regulations; 2. More efficient enforcement of CWD regulations. 3. DAM does not have the same law enforcement capabilities as DEC.

Disadvantage: None.

- Action 2.2.2: Annually, DEC Special Licenses Unit and DAM Division of Animal Industry cross reference DEC records for DEC Domestic Game Animal Breeder licensees with DAM records for captive white-tailed deer facilities and DAM shares records of other known CWD-susceptible cervid facilities in New York to ensure consistency. DEC and DAM will maintain accurate records and share annual reports, reports of facility inspections, reports of escapes or sick or dead animals, reports of cervid moved from facility-to-facility and reports of any alleged violations of license conditions or regulations.

Advantage: Accurate records of the captive cervid industry in New York and shared information related will reduce non-compliance with license conditions or regulatory mandates.

Disadvantage: Time invested by DEC and DAM personnel.

- Action 2.2.3: DEC and DAM will review and amend as needed existing procedures and requirements for decommissioning (closure) a cervid facility operation to ensure no threat of disease transmission to wild deer or other captive cervids. Herd closure options (1 NYCRR Part 68) will be made available by DEC Special Licenses Unit as part of the application process and as a license condition on the Domestic Game Animal Breeder License.

Advantage: 1. The two agencies should have a sound process that allows cervid operations to go out of business without creating an impetus to release the animals to the wild; 2. Decrease the number of captive cervid operations in the state.

Disadvantage: There may be issues with trying to place a large number of live captive cervids when a cervid operation elects to go out of business.

- Action 2.2.4: DEC and DAM will review current recordkeeping processes to ensure information collected is consistent and useful for both agencies.

Advantage: Will avoid unnecessary duplication of records, reduce paperwork for the cervid operations and provide critical information for CWD management.

Disadvantage: None.

- Action 2.2.5: DEC and DAM will explore the feasibility of employing some type of permanent identification for all captive cervids and, if feasible, take the necessary measures to make permanent identification a requirement.

Advantage: 1. Improves the ability of both agencies to trace an animal in the captive cervid system; 2. Provides both agencies with critical information about an animal's movement should CWD be found in a captive herd.

Disadvantage: 1. Will increase costs for cervid operators; 2. Will require maintaining additional records by DEC and DAM and the cervid owner; 3. It would be difficult to mark all natural birth animals in Special Purpose herds because of the lack of handling facilities and inability to capture all animals in large enclosures.

- Action 2.2.6: DEC and DAM will implement joint compliance inspections, facilities inspections and enforcement investigations to ensure that captive cervid operations are in compliance with DEC and DAM CWD prevention measures.

Advantage: Enforce regulations with a standardized method. This may be particularly important for new facilities that may have other regulatory issues.

Disadvantage: Increased time dedicated to inspections and enforcement.

Strategy 2.3: DEC and DAM review and revise regulations to reduce CWD risk from captive CWD-susceptible species and increase responsibility of owners of captive CWD-susceptible species facilities.

- Action 2.3.1: DEC and DAM will explore the feasibility of testing a higher percentage or all CWD-susceptible species that are killed or die in all Special Purpose herds and the possibility of requiring captive cervid owners to pay for testing.

Advantage: 1. Increase surveillance sample at locations known to bring in larger numbers of adult males; 2. Limit possibilities for clinical suspects to avoid detection.

Disadvantage: 1. Financial cost to DAM if they continue to collect samples and fund testing; 2. Captive cervid operators will object to paying for testing; 3. Increased DEC staff time to assist DAM with sample collection for testing.

- Action 2.3.2: DEC will amend Part 189 to prohibit distribution or disposal of [taxidermy](#), deer processor waste or byproducts (salt), and captive cervid operation waste on the landscape and conduct site visits to businesses to ensure compliance with solid waste regulations (6 NYCRR Part 360).

Advantage: Enforce existing regulations and improve security of hunting-related businesses and eliminate or significantly reduce an avenue of CWD transmission to wild deer.

Disadvantage: Time invested by DEC and DAM personnel to conduct compliance inspections.

- Action 2.3.3. DEC will explore the feasibility of legislative action to require a bond from Domestic Game Animal Breeder license applicants. This bond would be held to offset costs resulting from escape of captive CWD-susceptible cervids into the wild that DEC must remove or in the event that CWD has been introduced into New York by the actions of a Domestic Game Animal Breeder licensee.

Advantage: 1. Limits the state's financial burden if CWD is detected on a captive cervid operation; 2. Requires responsibility to be taken by captive cervid owners

for potential damage caused by their activities; 3. May encourage better fencing and routine maintenance.

Disadvantage: Existing Environmental Conservation statute related to Domestic Game Animal Breeder Licenses does not allow DEC to collect a bond.

- Action 2.3.4. DEC will explore options for assessing fines from actions involving captive cervids that have escaped into the wild and have the potential to introduce CWD to the wild deer herd.

Advantage: 1. Requires responsibility to be taken by captive cervid owners for potential damage caused by their activities; 2. May encourage better fencing and routine maintenance.

Disadvantage: 1. Some owners may not come forward to report escapes if they will be held liable; 2. Lack of permanent marking in Special Purpose herds makes differentiation of captive cervids difficult.

- Action 2.3.5: DEC and DAM will collect information on rendering of deer carcasses and composting road-killed wild deer to assess risks to human health and disease exposure to wild deer.

Advantage: Be able to make informed decisions about CWD and prions resulting from rendering or composting of CWD-susceptible animals.

Disadvantage: Composting road-kill is broadly practiced by NYSDOT and county municipalities, but not standardized across the state.

Strategy 2.4. DEC will minimize risk posed by rehabilitation of white-tailed deer.

- Action 2.4.1: DEC will develop license conditions that have appropriate procedures and protocols to ensure wildlife rehabilitation activities do not pose a threat of disease transmission and contribute to disease surveillance. These include record keeping and mortality reporting, facility inspections, movement restrictions, diagnostic testing and marking requirements, and disposal of carcasses in an approved manner.

Advantage: 1. License conditions will be systematically evaluated for the potential for wildlife disease transmission; 2. Rehabilitators have the potential to participate in disease surveillance activities.

Disadvantages: Limited oversight may cause difficulties ensuring compliance by the regulated community.

Goal 3: Provide education to increase the public understanding of CWD risks and impact on animal and human health

Wildlife disease prevention and management often involves changing human behaviors that contribute to disease introduction and transmission. It is the responsibility of DEC and DAM to not only inform the public, but to provide information about diseases, such as CWD, to engender support for management decisions made by DEC and DAM to protect the wildlife resources and the interests of livestock owners. Such education efforts must be based on the best scientific information and risk assessments available, and they must be developed and implemented in partnership with by experts in education and information (public relations/advertising professionals) for all the people of the state. As a relatively recently discovered disease, research on CWD is ongoing and new information becomes available monthly. There are several components of the etiology, monitoring, and management of the disease that are important to convey to the public so they understand the long-term consequences of CWD for the wild white-tailed deer population of New York State and public health concerns.

Disease detection and perceived threats to human health may contribute to a decline in hunter participation and recruitment (Vaske et. al. 2004). In turn, decreased hunting would reduce the effectiveness of the primary method that natural resource agencies use to control deer populations. [Higher deer densities](#) can lead to increased incidence of disease. Once the disease is established, managing the deer population will be costlier and less predictable. These facts are important for both the public and policy makers to understand in order to grasp the long-term consequences of CWD.

Epidemiologic studies, to date, have not provided any evidence of CWD transmission to humans, but follow-up of individuals at increased risk of exposure to CWD is ongoing. Laboratory research on primates and transgenic (e.g. humanized) mice is studying species barriers and routes of transmission. Inquiries about the safety of venison consumption should be handled by the New York State Department of Health (DOH). DEC and DOH continue to advise against consumption of ill or ill-acting animals.

Public interest in CWD waned in [Oneida County](#) and throughout the state several years after CWD was discovered in 2005. With no additional CWD cases discovered after intensive sampling from 2005 through 2009, it was difficult to engage stakeholder interest in the disease without substantial outreach efforts. However, it is the public trust duty of DEC to maintain the quality of wildlife for the people of the state for current and future generations. Diseases are a threat to wildlife resources and, consequently, to the quality of life in New York. In particular, CWD is a slowly progressive disease that may not be immediately devastating to wild deer populations, but could have significant impacts over the course of decades. It is incumbent on DEC, with their scientific and technical expertise, to explain the nature of these disease threats to the wildlife resources with the purpose of educating and informing the people of the state. To do this, a comprehensive, targeted communication strategy must be developed for various stakeholder groups to address concerns specific to their interests. These groups include hunters, the general public, captive cervid owners, landowners, and other groups or businesses handling deer (NYS Department of Transportation, [taxidermists](#), deer processors, rendering companies,

wildlife rehabilitators, landfill operators). Messages should be crafted in partnership among agencies to be disseminated across multiple media venues: print, online, social media, in person/hands-on, and lecture. Information should be targeted to:

1. Prevent introduction of CWD-infected materials by following regulations related to importation of live cervids, cervid products (e.g., urine), and hunter-killed carcasses;
2. Eliminate possible introduction of prions to wild white-tailed deer or moose by disposing of deer parts and processing waste where they are not accessible to wild animals, such as a municipal solid waste landfill;
3. Understand the biology of prion diseases that makes them unique among infectious agents because of the difficulties with detection and disinfection, long infection period when animals are shedding prions, ability to bind to the soil and plants and remain infectious (environmental contamination), potential population-level effects, and lack of immunity, treatment, vaccine, or effective management strategies for wild deer;
4. Recognize actions that contribute to disease transmission, such as concentrating animals around bait piles or feeding, mixing activities such as taxidermy, deer rehabilitation and captive cervid ownership including canned hunting operations;
5. Be aware of Interagency Response Plan actions to prevent the disease from becoming established and continue maintenance actions in areas if the disease is established.

Public engagement in CWD management and trust in the state wildlife agency are critical elements in the success in message delivery. Our recommendation is to develop avenues to inform the public about risks and engender support for disease prevention and control actions.

Strategy 3: Develop a communication plan defining messages and audience, outreach, and advertising strategy to re-engage various stakeholder groups in CWD education

- Action 3.1: DEC will take the lead in educating DEC agency personnel, hunters, policy makers, and public through increased information available in print (CWD Fact Sheet and poster at all DEC offices and Sportsmen Education classes, DEC press releases, The Conservationist), online (DEC website, websites of partner agencies and organizations), and in-person (meetings/conventions of hunting and other conservation organizations, Sportsmens Education Instructor Refresher meetings)

Advantage: Re-engage stakeholders in a conservation message related to disease prevention.

Disadvantage: Requires considerable effort from multiple divisions and outside assistance.

- Action 3.2: DAM will take the lead in educating captive cervid owners on the risks of CWD

Advantage: Provide a balanced and scientific view of why CWD presents a risk to their industry and wild deer.

Disadvantage: Requires considerable effort by agency personnel.

- Action 3.3: DEC will take the lead in ensuring landfill operators understand the importance of proper disposal of deer carcasses and allow use of their facilities for disposal. Work with DEC Waste Management to educate landfill operators (Completed Summer 2014)
- Action 3.4: DEC will include the NYS Fish and Wildlife Management Board and NYS Conservation Council in discussions of CWD prevention to ensure engaged stakeholders have a better understanding of CWD implications (Completed 2013-2014)
- Action 3.5: DEC will provide information on CWD regulations online and in the annual hunting regulation guide.

Definitions

Captive cervid facility – facility that raises and sells deer and elk or their products (urine, velvet, venison, antlers, shooting opportunities), 8-ft fence required, and permit from DEC for white-tailed deer

Certified herd – captive cervid operation that participates in DAM CWD Herd Certification Program by identifying animals, reporting and testing all mortalities in deer over 12-months and is able to move live deer and elk off the premises

Cervid – hooved mammal that typically grows and sheds antlers yearly; includes deer, elk, and moose

Cleaned skull cap – Topmost portion of the skull with antlers (hardened or velvet) and pedicle attached. No adhering brain material, skin, or other soft tissue. The skull portion should be treated for one hour in a 10% bleach solution to denature prions.

Environmental contamination – prions shed in carcasses, urine, feces, and saliva bind to the soil and plants and remain infectious to deer

Index (herd or animal) – first disease detection in a location or animal that starts the epidemiology investigation

Prevalence – Number of animals positive for CWD divided by number of animals in the population

Prion – misfolded protein that is the infectious agent of CWD

Commercial fenced shooting operation (canned hunt, shooter herd, preserve) – facility that sells the opportunity to shoot a captive animal within a fenced enclosure; does not require a license; pricing is typically based on animal’s antler size; falls into the “Special Purpose” category for testing

Special purpose (Monitored) – captive cervid operation that does not have live animals leaving the facility unless going to slaughter; current CWD testing is 10% of the total population up to 30 animals per year; animals are not required to be identified or inventoried. Facilities are not required to have animal handling equipment

Trace-back – epidemiological investigation examining all animals and parts imported into a location to determine the source of infection

Trace-outs – epidemiological investigation examining all the movements of animals into and out of a facility to determine the source of infection and any possible exposures of other animals to an infected animal

Velvet antler – whole cartilaginous antler prior to calcification

References

- Almberg, E.S., P.C. Cross, C.J. Johnson, D.M. Heisey, B.J. Richards. 2011. Modeling routes of chronic wasting disease transmission: environmental prion persistence promotes deer population decline and extinction. *PLoS One* 6:e19896. Doi:10.1371/journal.pone.0019896
- Angers, R.C., S.R. Browning, T.S. Seward, C.J. Sigurdson, M.W. Miller, E.A. Hoover, G.C. Telling. 2006. Prions in skeletal muscles of deer with chronic wasting disease. *Science* 311:1117
- Angers, R.C., T.S., Seward, D. Napier, M. Green, E. Hoover, T. Spraker, K. O'Rourke, A. Balachandran, G.C. Telling. 2009. Chronic wasting disease prions in elk antler velvet. *Emerging Infectious Diseases* 15:696-703
- Decker, D.J., K.L. Schuler, A.B. Forstchen, M.A. Wild, and W.F. Siemer. 2016. Wildlife health and public trust responsibilities for wildlife resources. *Journal of Wildlife Diseases* 52:775-784.
- DeVivo, M.T., D.R. Edmunds, M.J. Kauffman, B.A. Schumaker, J. Binfet, T.J. Kreeger, B.J. Richards, H.M. Schätzl, and T.E. Cornish. 2017. Endemic chronic wasting disease causes mule deer population decline in Wyoming. *Plos ONE* 12 (10): e0186512. <https://doi.org/10.1371/journal.pone.0186512>
- Edmunds, D.R., M.J. Kauffman, B.A. Schumaker, F.G. Lindzey, W.E. Cook, T.J. Kreeger, R.G. Grogan, and T.E. Cornish. 2016. Chronic wasting disease drives population decline of white-tailed deer. *Plos ONE* 11(8): e0161127. doi:10.1371/journal.pone.0161127
- Fryer, H.R., A.R. McLean. 2011. There is no safe dose of prions. *Plos ONE* 6: e23664. doi:10.1371/journal.pone.0023664
- James, P.C. 2008. Both sides of the fence: A strategic review of chronic wasting disease management costs and benefits. A report prepared for the Canadian Wildlife Federation. Regina, Canada: University of Regina, 55pp.
- Georgsson, G.S., S. Sigurdarson, and P. Brown. 2006. Infectious agent of sheep scrapie may persist in the environment for at least 16 years. *Journal of General Virology* 89:3737-3740.
- Hanisch-Kirkbride, S.L., S.J. Riley, and M.L. Gore. 2013. Wildlife disease and risk perception. *Journal of Wildlife Diseases* 49:841-849. doi: 10.7589/2013-02-031
- Henderson, D.M. N.D. Denkers, C.E. Hoover, N. Garbino, C.K. Mathiason, E.A. Hoover. 2015. Longitudinal detection of prion shedding in saliva and urine by chronic wasting disease infected deer by real-time quaking-induced conversion. *Journal of Virology* 89:9338-9347. doi:10.1128/JVI.01118-15
- John, T.R., H.M. Schätzl, and S. Gilch. 2013. Early detection of chronic wasting disease prions in urine of pre-symptomatic deer by real-time quaking-induced conversion assay. *Prion*. doi.org/10.4161/pri.24430

Kramm, C., S. Pritzkow, A. Lyon, T. Nichols, R. Morales, and C. Soto. 2017. Detection of prions in blood of cervids at the asymptomatic stage of chronic wasting disease. *Scientific Reports* 7:17241. DOI: 10.1038/s41598-017-17090-x.

Long, E.S., D.R. Diefenbach, C.S. Rosenberry, and B.D. Wallingford. 2008. Multiple proximate and ultimate causes of natal dispersal in white-tailed deer. *Behavioral Ecology*. doi:10.1093/beheco/arn082

Mathiason, C.K., J.G. Powers, S.J. Dahmes, D.A. Osborn, K.V. Miller, R.J. Warren, G.L. Mason, S.A. Hays, J. Hayes-Klug, D.M. Seelig, M.A. Wild, L.L. Wolfe, T.R. Spraker, M.W. Miller, C.J. Sigurdson, G.C. Telling, E.A. Hoover. 2006. Infectious prions in the saliva and blood of deer with chronic wasting disease. *Science* 314:133-136.

Miller, M.W., H.M. Swanson, L.L. Wolfe, F.G., Quartarone, S.L. Huwer, C.H. Southwick, P.M. Lukacs. 2008. Lions and prions and deer demise. *Plos One*. doi:10.1371/journal.pone0004019

Needham, M.D., J.J. Vaske, and M.J. Manfredo. 2004. Hunters' behavior and acceptance of management actions related to chronic wasting disease in eight states. *Human Dimensions of Wildlife* 9:211-231.

Nichols, T.A., J.W. Fisher, T.R. Spraker, Q. Kong, and K.C. VerCauteren. 2015. CWD prions remain infectious after passage through the digestive system of coyotes (*Canis latrans*). *Prion* 4:0. [Epub ahead of print]

Plummer, I.H., S.D. Wright, C.J. Johnson, J.A. Pedersen, and M.D. Samuel. 2017. Temporal patterns of chronic wasting disease prion excretion in three cervid species. *Journal of General Virology* DOI 10.1099/jgv.0.000845

Pritzkow, S., F. Moda, U. Khan, G.C. Telling, E. Hoover, and C. Soto. 2015. Grass plants bind, retain, uptake, and transport infectious prions. *Cell Reports* 11(8):1168-115, doi:10.1016/j.celrep.2015.04.036

Romano, M. 2012. The Effects of Chronic Wasting Disease on the Pennsylvania Cervid Industry Following its Discovery. Master of Public Health Thesis, Drexel University, Philadelphia, Pennsylvania.

Oraby, T., M.G. Tyshenko, M. Westphal, S. Darshan, M.C. Croteau, W. Aspinall, S. Elsaadany, N. Cashman, and D. Krewski. 2016. Using expert judgements to improve chronic wasting disease risk management in Canada. *Journal of Toxicology and Environmental Health, Part A*. 79:16-17, 713-728.

Schuler, K.S., A.M. Wetterau, E.M. Bunting, H.O. Mohammed. 2016. Exploring perceptions about chronic wasting disease risks among wildlife and agriculture professionals and stakeholders. *Journal of Wildlife Management* 40:32-40, DOI: 10.1002/wsb.625.

Slovic, P. 1987. Perception of risk. *Science* 236:280-85.

Vaske, J.J. N.R. Timmons, J. Beaman, J. Petchenik. 2004. Chronic wasting disease in Wisconsin: hunter behavior, perceived risk and agency trust. *Human Dimensions of Wildlife* 9:193-209.

VerCauteren, K.C., J.L. Pilon, P.B. Nash, G.E. Philips, and J.W. Fisher. 2012. Prion remains infectious after passage through digestive system of American crows (*Corvus brachyrhynchos*). *Plos One* 7(10):e45774, doi: 10.1371/journal.pone.0045774

Williams, E.S. 2005. Chronic wasting disease. *Veterinary Pathology* 42:530-549.

Appendix I. Assessment of Public Comments on the Draft New York State Interagency CWD Risk Minimization Plan

DEC received written comments from several hundred individuals and organizations on the draft Interagency Chronic Wasting Disease (CWD) Risk Minimization Plan during the public comment period (August 2 – Sept. 15, 2017). We appreciate the time and effort that so many took to express their views in writing.

DEC reviewed each of the comments and consulted with members of the Interagency CWD Team regarding appropriate response and actions. We did not count comments as though they represented a vote for or against a specific action; rather, we reviewed comments for substance, regardless of the number of people who commented similarly. We prepared this overview of the principal and most substantive comments in the order they are represented in the plan. We discuss each of these issues and explain our response to each below.

Comments ranged across a spectrum. In general, there was widespread recognition of the threat posed by CWD and considerable support for the intent to prevent the spread of CWD into New York, with strong endorsement for much or all of the plan by various New York and national hunting and conservation groups. However, comments also reflected significant difference in perception of the risks associated with various pathways of potential disease introduction or spread (e.g., natural cervid urine products, movement of live captive cervids). Some commenters felt that because CWD has not been detected in New York since 2005, proposed steps to further protect New York deer are unnecessary or that risks identified in the plan do not outweigh the perceived costs of the proposed actions. Alternatively, some comments indicated that the actions described in the draft plan should go further, specifically suggesting that captive cervid breeding and fenced shooting facilities in New York be eliminated or a moratorium established to prohibit new facilities or transfer of ownership.

Summary of Comments by Proposed Action or Strategy

Action 1.1.1: DEC will amend 6 NYCRR Part 189 to implement a comprehensive ban on importation of certain parts or tissues of hunter-harvested cervids (deer, elk and moose), regardless of origin. Importers shall only import the deboned meat, cleaned skull cap, antlers with no flesh adhering, raw or processed cape or hide, cleaned teeth or lower jaw, and finished taxidermy products or tanned hides.

Summary of Comment: *Though a few hunters disagreed with the comprehensive carcass import ban, preferring the ban only extend to jurisdictions where CWD has been detected, other hunters and hunting organizations agreed that this was a reasonable protective measure. One writer asked for clarification and recommended procedure for cleaning a skull cap.*

Response: Disease prevention regulations and CWD surveillance intensities vary considerably among jurisdictions (i.e., state to state). As explained in the plan, by the time CWD is detected in a state or province, it may have been present in that state or province for several years. Thus,

prudence dictates that carcass importation be prohibited from all jurisdictions. We appreciate the suggestion to provide greater clarity regarding carcass parts that can be safely brought into New York and will address that in the final plan.

Action 1.1.2: DEC will amend 6 NYCRR Part 189 to prohibit retail sale, and possession, use, and distribution while afield of the urine, glands, or other excreted substances or products containing the urine or excreted substances from any CWD-susceptible animal for any purpose.

Summary of Comment: This proposed action generated the most attention, with strongly opposing viewpoints.

Several New York hunting and conservation organizations and numerous hunters expressed strong support for the recommended action, stating that the continued use of cervid urine products is not worth the associated CWD risks. Many supporters noted that the health of our wild deer and moose populations are of greater importance than the potential impact of the prohibitions on the captive cervid industry within the state.

Conversely, the general sentiment expressed by those hunters who believe urine-based lures are important to their success, and by individuals and businesses that produce and sell urine-based lures, was that the risks associated with cervid urine products are too small to justify a ban on use and sale. Some hunters mistakenly believed that manufacturers were testing their products to ensure prion-free status. Others felt the proposed action is unenforceable, may lead to a black market of deer urine, or will decrease deer harvest leading to an increase of deer-related agriculture and forest damage or deer-vehicle collisions. Many dissenters, including scent producers and manufacturers, argued that CWD has not been definitively proven to be spread by commercial urine products or that the risks associated with cervid urine are negligible. They claimed that transmission of CWD through infected urine has only been demonstrated under artificial conditions using highly concentrated urine inoculated into the brain of mice or orally to deer. Many reiterated the statement of a prion researcher who suggested that the use of urine-based scents spreading CWD is “virtually zero.” Scent manufacturers and urine producers frequently mentioned the Archery Trade Association’s (ATA) Deer Protection Program voluntarily adopted by several large commercial deer urine distributors and their associated production facilities to reduce their CWD exposure risk. These industry representatives requested that the Interagency CWD Team consider permitting only cervid urine products from companies that participate in the ATA’s Deer Protection Program. Another alternative put forth by some captive cervid owners and urine producers in New York suggested that the Interagency CWD Team consider prohibiting urine-based products produced outside New York while allowing New York producers to continue to generate and sell their products.

Response: We have concerns that products containing urine, glands, or other secreted substances collected from CWD-susceptible species represent a risk for the introduction and spread of CWD

into New York (Appendix 1). CWD prions have been found in urine of infected and asymptomatic deer in multiple studies.

While the level of risk represented by urine products may not be easily quantified, the risk is not zero. Amplification of urine distribution through repeated use of natural urine-based products (often in the exact same location from one hunt to the next) makes the risk additive. CWD prions remain infectious in the environment for years. Therefore, repeatedly applying deer urine at the same place over time could potentially expose deer to infectious prions either remaining or added, increasing the probability of and opportunity for transmission. The risk is not quantifiable, but the risk is not zero.

The Northeast Deer Technical Committee, which is comprised of wildlife biologists from northeastern states and provinces, has recommended prohibitions on the use of natural cervid urine as lures and attractants. Similarly, the Northeast Association of Fish & Wildlife Agencies has urged every state and province in the region to take all possible measures to prevent the introduction and further spread of CWD, including restricting or eliminating products manufactured from captive cervids including their urine (2014; Appendix 2) and has encouraged all state and provincial wildlife agencies to ban the use of natural-based cervid urine products (2017; Appendix 3).

We likewise acknowledge that the proposed action would require the captive cervid facilities that produce urine in New York and the retailers who sell cervid urine products in the state to modify their business practices by selling their product outside New York or only sell synthetic alternatives.

As several comments noted, the Archery Trade Association (ATA) has promoted a voluntary program for scent manufacturers and cervid urine producers in an attempt to lower the risk of their products being infected with CWD prions. While we appreciate the initiative, the ATA's program does not seem to be adequate to prevent possible CWD transmission. At its core, the ATA program is based on the USDA CWD Herd Certification Program, which has been shown to be insufficient at preventing CWD from spreading among captive cervid facilities. Since 2012, CWD has been detected in 12 captive cervid herds with 5 or more years of monitoring, the minimum necessary for certification under the USDA program (these were certified herds actually infected with CWD). An additional concern is that the ATA's program, like the US Dept. of Agriculture (USDA) CWD Herd Certification Program it is built upon, is voluntary and would not reduce risks associated with scent manufacturers and cervid urine production facilities that do not participate or are removed from either program. In response, the ATA and participating scent manufactures have suggested that regulations be enacted which would allow only the use of urine products from manufacturers and producers that participate in the ATA's program, but it is not clear that this would be sufficient to address the concerns about the limitations of the program.

Our responsibility as wildlife managers is to recommend measures to prevent the introduction of CWD to the NY deer herd. Regulating the use of urine and scents containing urine is one viable measure based on our knowledge of prions and exposure of CWD susceptible animals to prions. However, best available science suggests the risk of CWD transmission through use of urine products is low. We will continue to review the science of prions in deer urine and the risks

associated with using natural urine products as an attractant by hunters through 2018. Thus, the Plan now reflects additional assessment to better determine actual risk will be completed prior to initiating any future regulatory action or other initiatives to limit or prohibit the use of cervid urine. Additionally, DEC will encourage voluntary restraint from use of natural cervid urine products as we more fully review risk.

Action 1.1.3: DEC will amend 6 NYCRR Part 189 to only include a list of known CWD susceptible species by removing those species that have not been found at this time to be susceptible to CWD.

Summary of Comment: *This action was supported by an organization representing captive cervid owners, but one writer suggested that species within the Genus Cervus, Odocoileus and Alces should be considered susceptible until scientifically demonstrated otherwise.*

Response: At this time, the CWD regulation contains the names of some species that have not been found to be susceptible to chronic wasting disease. DEC will amend this list of species to contain only those species found to be CWD-susceptible. In the event that a species is later found to be CWD-susceptible, DEC has the authority to promulgate an emergency amendment to this regulation and to immediately add the new species to the list.

Action 2.1.1: DEC will prohibit feeding of wild deer via regulation 6 NYCRR Part 186.

Summary of Comment: *Several writers indicated that feeding of wild deer should be lawful and expressed their belief that provision of supplemental feed is important for the welfare and survival of deer during winter in parts of the state. Others commented that the feeding regulations need to be carefully crafted to address incidental feeding and ensure enforceability. One writer suggested that DEC prohibit the sale of products (e.g., mineral blocks) used to attract and bait deer.*

Response: New York State Environmental Conservation Law 11-0505(8) currently prohibits feeding of deer within 300 feet of a public roadway. This arbitrary distance is insufficient to prevent the negative ecological and behavioral impacts and elevated risk of deer-vehicle collisions or disease transmission associated with intentional and incidental feeding of deer and moose. Thus, DEC has held a general prohibition of the intentional feeding of wild deer in regulation (6 NYCRR Part 189) since 2002. The proposed action of the Interagency CWD Risk Minimization Plan would strengthen the longstanding prohibition.

A broad prohibition on feeding deer and moose is a best management approach to reduce risks associated with CWD; however, the justification is equally applicable for reducing spread of other communicable diseases and minimizing ecological and behavioral impacts. Importantly, supplemental feeding to enhance the deer population is unnecessary in New York and may have significant ecological consequences through exacerbating deer damage to local habitats. Too, supplemental feeding can negatively affect deer behavior, leading to increased social conflict among deer, habituation of deer to human presence, and alteration of migratory movements to critical wintering areas.

DEC intends to propose a new regulation (6 NYCRR Part 186) to prohibit the intentional feeding of wild deer and moose and the incidental feeding of wild deer and moose after an initial warning from the Department. We will continue to provide exemptions for bird feeders, wildlife plantings, and bona fide agricultural purposes. Existing sections of Part 189 pertaining to the feeding of deer will be removed to avoid confusion with Part 186.

Strategy 2.2: DEC and DAM will collaborate more closely on oversight of captive CWD-susceptible cervid operations; and **Strategy 2.3:** DEC and DAM review and revise regulations to reduce CWD risk from captive CWD-susceptible species and increase responsibility of owners of captive CWD-susceptible species facilities.

Summary of Comment: Several writers and organizations commended the collaborative efforts of DEC and DAM in oversight, inspection, and enforcement of captive cervid facilities, suggesting that the proposed actions present a good model for other jurisdictions. A few individuals objected to DEC enforcing DAM regulations or expressed concern that DEC would abuse the scope of authority by attempting to assume total control of captive cervid facilities.

Several captive cervid owners or organizations representing their interests commented specifically that Actions 2.2.5 and 2.3.1, relating to permanent identification of all captive cervids and testing of all captive cervids that are killed or die in all Special Purpose herds, are not practical or would create an unbearable burden for facility owners. Additionally, captive cervid owners and representative organizations objected to the concepts presented in Actions 2.3.3 and 2.3.4 which would direct some financial responsibility to the captive cervid owner in the event an animal escapes or should CWD be introduced into New York due to the actions of a captive cervid owner. Their comments suggested that captive cervids be treated as livestock and questioned whether similar requirements exist for owners of cattle, sheep, goats, or horses.

In contrast, other writers agreed that captive cervid owners should be held responsible for costs incurred responding to escaped animals and risks associated with the potential introduction or dissemination of infectious CWD prions. In addition to fines and bonds, one writer suggested exploring possible insurance options for captive cervid owners to internalize industry-driven costs and address impact risks.

Response: Despite a range of Federal and state laws, regulations and other measures intended to prevent the spread or reduce CWD prevalence, the disease continues to be identified in new areas nationally, including 30 additional captive cervid facilities since 2012. State and provincial agriculture agencies are not well equipped to enforce laws and regulations regarding captive cervids, and oversight is often minimal (e.g., many state agriculture departments do not maintain a list of deer urine producers within their jurisdiction). As a result, nationally, there are numerous examples of prohibited activities occurring within the industry (i.e., illegal inter- or intra-state movement of live CWD-susceptible cervids, intentional releases, incomplete and/or falsified

records) that exacerbate risks of CWD spread within the captive cervid industry and to surrounding wild cervid populations.

Specifically, in New York, several captive cervid facilities have failed to maintain compliance with either DEC or DAM CWD requirements including: failure to obtain or maintain proper licensing, failure to submit the required number of samples from CWD-susceptible cervids for testing, failure to maintain the integrity of fences and the subsequent failure to prevent escapes, failure to mark individual animals, and failure to adhere to reporting requirements.

Together these compliance issues present risks that would substantially complicate disease containment including DEC's and DAM's ability to conduct trace-outs (i.e., track where infectious material came from and where it has gone), should CWD be detected within a captive cervid facility in New York. Further, identifying and responding to patterns of non-compliance has been challenging because DAM and DEC have historically maintained separate records with separate reporting processes.

DEC and DAM currently share joint regulatory oversight for captive white-tailed deer, a structure that has fostered substantial collaboration and strengthens our CWD surveillance program and efforts to protect wild and captive cervids in New York from CWD. It should be noted that DEC law enforcement officers already possess the authority to enforce DAM regulations pursuant to their status as peace officers provided in the New York State Criminal Procedure Law. By mirroring certain specific language in DAM's CWD rules in DEC regulations, our Environmental Conservation Officers (ECOs) will be better able to address violations by issuing tickets pursuant to the Environmental Conservation Law. This streamlines the process, and allows the person in violation to handle the matter more efficiently, utilizing local town courts. The proposed action does not expand existing enforcement authority of ECOs.

The plan calls for DEC and DAM to explore the feasibility of permanent marking of all captive cervids. Prior to pursuing this strategy, DEC and DAM will work with cervid owners to best understand the challenges associated with permanent marking. However, the plan identifies the need to test all CWD-susceptible animals that are killed or die within Special Purpose (captive shooting) herds and permanent marking will help with this effort. Current rules require testing of only 10% or up to 30 animals annually, with animal selection at the discretion of the owner. This limited testing may fail to detect diseased animals, particularly if there is high turnover of animals with short durations between import and harvest. Though some captive cervids may die and be undetected for weeks or months within large enclosures, testing as near to 100% as possible will significantly improve disease surveillance.

Though captive cervid owners clearly objected to the notion of increased financial responsibility, bond-holding is a common requirement to ensure compliance with regulations. Nationally, livestock dealers must hold a surety bond prior to obtaining a state livestock dealer license. Similarly, DEC requires bonds for a variety of permitted and licensed activities, that if conducted poorly may result in substantial ecological and environmental damage (e.g., commercial timber harvest on state land, oil and gas well operation, and hazardous waste management). Given the clear ecological risk and

costs to DEC, DAM, and the people of New York State should CWD be detected within a captive cervid facility or in a wild cervid population as a result of the actions or inactions of a captive cervid owner, we believe demonstration of financial assurance by captive cervid owners is a reasonable requirement. Additionally, captive cervid owners may opt to purchase insurance for high-value animals or their entire herd, as described by the North American Deer Farmers Association (www.nadefa.org/articles/general-information-about-deer-farming).

Strategy 3: Develop a communication plan defining messages and audience, outreach and advertising strategy to re-engage various stakeholder groups in CWD education.

Summary of Comment: *The State Legislature needs to be a target for education too.*

Response: We agree.

Response to General Comments Not Associated with a Proposed Action or Strategy

Comment: The state should require CWD testing of all hunter-killed cervids or provide opportunity for hunters to voluntarily submit samples for testing.

Response: The laboratory test for CWD is not a food safety test. The results are either: 1) positive for CWD or 2) non-detect for CWD. A non-detect for CWD does not mean that the animal is free of CWD.

Comment: Since taxidermists are required to dispose of waste material in landfills, the state should allow intact cervid heads to be imported into New York for taxidermy purposes.

Response: People doing taxidermy for hire as a business are required to dispose of taxidermy waste in bona fide municipal landfills. However, not all taxidermists are doing taxidermy as a business. Recreational taxidermists would not be subject to the requirements for disposal in a landfill. In addition, DEC does not maintain a list of people doing business as a taxidermist and would not be able to confirm compliance with waste disposal requirements (Appendix V).

Comment: Consider passing on the costs associated with CWD testing of captive cervids from DAM to the special purpose herd operators.

Response: Additional information on the logistics, associated costs, and other aspects associated with such an action is necessary to determine if this option is feasible.

Comment: Consider an exemption to the general prohibition on deer feeding for trail camera surveys.

Response: At this time, we do not have any information to determine the size and scope of this activity and, therefore, exactly what such exemption would mean to a CWD disease prevention effort. Trail cameras, used for recreational wildlife-viewing purposes, can successfully be used without providing feed. If trail cameras are being used for surveys as part of a wildlife research

program, the research coordinator can request permission from DEC for the use of “bait” for this limited purpose.

Comment: Responsible movement of live cervids should be allowed from facilities that have had at least five years of herd monitoring.

Response: Within New York, DAM already allows the monitored movement of live cervids from certified facilities. The USDA CWD Program Standards, promulgated to ensure animals from Certified herds can be moved, has failed to prevent the movement of CWD. Neither DEC nor DAM has the ability to verify the compliance with CWD prevention measures on cervid facilities outside of New York. Any importation of live CWD-susceptible cervids into New York is an unnecessary risk. DAM already prohibits such importation.

Comment: Captive breeding and fenced shooting facilities in New York should be eliminated or a moratorium should be established to prohibit new facilities or transfer of ownership.

Response: The New York State Environmental Conservation Law (ECL) authorizes DEC to issue domestic game animal breeder licenses for the possession and propagation of captive white-tailed deer, but DEC does not have authority to issue licenses for the possession of captive elk or other CWD-susceptible cervids. Thus, a moratorium on new domestic game animal breeder licenses would not prevent establishment of new facilities for the shooting of captive elk or other captive CWD-susceptible cervids. However, the operation of captive facilities for any CWD-susceptible cervids poses a risk to New York State’s wild deer and moose.

The lawful possession of captive deer and elk dates to the establishment of New York’s Conservation Law in 1911 (§372), which authorized raising and selling of domesticated elk and deer “for breeding or stocking purposes and to kill and transport the same and sell the carcasses thereof for food.” The original law authorized the licensee to kill captive deer or elk and outlined requirements for tagging, transportation, and sale of venison. It is apparent that historically, the law was established to provide a legal supply of captive-raised venison into the commercial food market. Though sale of captive-raised venison continues to a limited extent today, the industry is currently focused on selective breeding of cervids, particularly white-tailed deer, to produce abnormally large antlers. These animals are then transferred to fenced shooting facilities, where the opportunity to kill the captive animal is sold, and the animals with the largest antlers garner the highest prices.

The shooting of captive cervids differs markedly from fair-chase hunting of wild deer, elk and moose. Laws and regulations that govern hunting, including specific seasons, limited methods in which animals may be taken, and required licenses and safety training, do not apply to individuals who pay to kill cervids confined within a fence.

Should the New York State Legislature reconsider the appropriateness and relative risks associated with captive shooting facilities, ECL §11-1904, which prohibits canned shoots of *non-native* big game animals, could be amended to also prohibit the taking of confined *native* big game animals and eliminate or expand minimum pen sizes. Alternatively, ECL §11-1905, governing the possession of

domestic game animals could be amended to prohibit the receipt of compensation for the shooting or killing of domestic game animals.

Conclusion

As wildlife veterinarians, disease ecologists, biologists, and law enforcement entrusted with the public trust stewardship responsibility of managing wild deer and moose for current and future generations of New Yorkers, we contend that CWD presents the greatest threat to wild cervids in North America, and therefore, strong and comprehensive measures must be implemented to prevent the introduction and spread of CWD into New York. We assert that collectively, the primary and greatest concern of conservationists, hunters, wildlife enthusiasts, and New Yorkers is to preserve the health and sustainability of our wildlife resources. That imperative should outweigh potential impacts on hunting or business practices when such practices pose a risk of irreparable damage to our wildlife resources.

Importantly, we note that both New York State Departments of Agriculture and Markets (DAM) and Environmental Conservation (DEC) have already undertaken numerous steps to address several key risk factors to limit the potential introduction of CWD to New York. DAM adopted a rule prohibiting importation of live CWD-susceptible cervids into New York. DEC prohibited importation of CWD-susceptible cervid carcasses and high-risk carcass parts into New York from a broad swath of North America, including all states and provinces where CWD has been detected in wild or captive animals. Additionally, DEC has prohibited all importation of CWD-susceptible cervid carcasses or high-risk carcass parts from captive animals killed within any fenced shooting facility. Together, these rules present a foundational first-level defense. The intention of the Interagency CWD Risk Minimization Plan is to strengthen that foundation, isolating and minimizing to the extent possible other controllable avenues of potential CWD introduction and spread.

Appendix I-A: CWD Risk Related to Cervid Urine Products

- Prions have been detected in saliva, feces, blood, velvet, and urine (Angers et al. 2006, Angers et al. 2009, Haley et al. 2011, Henderson et al. 2015, Mathiason et al. 2006, Plummer et al. 2017).
- Infected deer may shed prions in their urine for months prior to developing symptoms and may shed thousands of prion infectious doses over the course of CWD infection (Henderson et al. 2015).
- Urine sold commercially is collected from captive cervid facilities. Extensive movement of animals, limited and delayed testing, and shared equipment between breeder herds and shooting herds on the same facility make captive cervids a high risk for CWD.
- Nationally, CWD continues to be found at captive cervid facilities. Since 2012, CWD has been detected in 30 captive cervid facilities, including 8 fenced shooting facilities, 1 exhibition facility, and 21 breeding facilities. Of the 21 breeding facilities where CWD was detected, 9 were enrolled in the USDA CWD Herd Certification Program, and 12 facilities had been monitored for CWD for five or more years.
- Cervid-urine products are frequently batched from multiple locations and distributed across the country via retail, internet, and catalog sales. Urine production and sale is not regulated by any agency, nor are there any testing or marking requirements of urine products.
- CWD prions are excreted in higher concentrations in saliva and feces than in urine (Henderson et al. 2015, Plummer et al. 2017). Deer urine is often collected through a grate system which allow mixing of saliva and feces with the urine prior to filtering. This mixing could increase the likelihood of CWD-infected urine entering the scent market.
- There is no “safe” dose of prion (Fryer and McLean 2011).
- There is currently no rapid, cost effective test to determine if collected urine contains prions (John et al. 2013).
- Prions readily bind to soil minerals and remain infectious (Johnson et al. 2006). If cervid urine containing prions is put on the landscape by deer hunters, in a scrape or other area used by cervids, prions may bind to soil and contaminate that location for years or decades.
- Models have demonstrated that risk of CWD transmission from the environment increases over time as prions accumulate (Almberg et al 2011). Repeated applications of deer urine at the same place over time could potentially build a reservoir of prions, increasing the likelihood of transmission.
- Plants are capable of binding prions on leaves and taking up prions into their tissues; those prions remain infectious (Pritzkow et al. 2015). Cervids attracted to that location have the potential to then ingest prions in plants or soil and become infected.
- Healthy deer have contracted CWD when held within a paddock used 2 years previously by infected deer (Miller et al. 2004) and when exposed to water, feed buckets, and bedding of infected deer (Mathiason et al. 2009).
- Bans on use of natural cervid urine products currently exist in Alaska, Arkansas, Arizona, New Mexico, Vermont, and Virginia, and Manitoba, Nova Scotia, Ontario, and Yukon Territory.
- The Northeast Deer Technical Committee (biologists from agencies across northeastern US and Canada) recommends prohibitions on the use of natural cervid urine as lures and attractants.
- The Northeast Association of Fish & Wildlife Agencies has urged every state and province in the region to take all possible measures to prevent the introduction and further spread of CWD and

strongly encourages agencies to ban the use of natural-based cervid urine products and other bodily fluids in their respective jurisdictions (<http://www.neafwa.org/resolutions.html>).

Bottom Line

- ⊙ No effective test for CWD on live cervids
- ⊙ No rapid, cost-effective test to detect prions in urine-based products
- ⊙ The exact risk of CWD introduction through urine products is unknown, but it is not zero.
- ⊙ The only guaranteed CWD-free scents are fully synthetic.

References

- Almberg, E.S., P.C. Cross, C.J. Johnson, D.M. Heisey, and B. J. Richards. 2011. Modeling routes of CWD transmission: environmental prion persistence promotes deer population declines and extinction. <http://dx.doi.org/10.1371/journal.pone.0019896>
- Angers, R.C., S.R. Browning, T.S. Seward, C.J. Sigurdson, M.W. Miller, E.A. Hoover, G.C. Telling. 2006. Prions in skeletal muscles of deer with chronic wasting disease. *Science* 311:1117
- Angers, R.C., T.S., Seward, D. Napier, M. Green, E. Hoover, T. Spraker, K. O'Rourke, A. Balachandran, G.C. Telling. 2009. Chronic wasting disease prions in elk antler velvet. *Emerging Infectious Diseases* 15:696-703
- Fryer, H.R., A.R. McLean. 2011. There is no safe dose of prions. *Plos ONE* 6: e23664. doi:10.1371/journal.pone.0023664
- Gough, K.C. and B. C. Maddison. 2010. Prion transmission. *Prion* 4:275–282.
- Haley, N.J., C.K. Mathiason, S. Carver, M. Zabel, G.C. Telling, E.A. Hoover. 2011. Detection of CWD prions in salivary, urinary, and intestinal tissues of deer: Potential mechanisms of pathogenesis and prion shedding. *Journal of Virology* 85:6309-6318. doi:10.1128/JVI.0425-11.
- Henderson, D.M., N.D. Denkers, C.E. Hoover, N. Garbino, C.K. Mathiason, E.A. Hoover. 2015. Longitudinal detection of prion shedding in saliva and urine by chronic wasting disease infected deer by real-time quaking-induced conversion. *Journal of Virology* 89:9338-9347. doi:10.1128/JVI.01118-15
- John, T.R., H.M. Schatzl, and S. Gilch. 2013. Early detection of chronic wasting disease prions in urine of pre-symptomatic deer by real-time quaking-induced conversion assay. *Prion*. doi.org/10.4161/pri.24430
- Johnson CJ, Phillips KE, Schramm PT, McKenzie D, Aiken JM, et al. 2006. Prions Adhere to Soil Minerals and Remain Infectious. *PLOS Pathogens* 2(4): e32. doi.org/10.1371/journal.ppat.0020032
- Mathiason, C.K., J.G. Powers, S.J. Dahmes, D.A. Osborn, K.V. Miller, R.J. Warren, G.L. Mason, S.A. Hays, J. Hayes-Klug, D.M. Seelig, M.A. Wild, L.L. Wolfe, T.R. Spraker, M.W. Miller, C.J. Sigurdson, G.C. Telling, E.A. Hoover. 2006. Infectious prions in the saliva and blood of deer with chronic wasting disease. *Science* 314:133-136.
- Mathiason C.K., S.A. Hays, J. Powers, J. Hayes-Klug, J. Langenberg, et al. 2009. Infectious Prions in Pre-Clinical Deer and Transmission of Chronic Wasting Disease Solely by Environmental Exposure. *PLoS ONE* 4(6): e5916. doi:10.1371/journal.pone.0005916

Miller M. W., Williams E. S., Hobbs N. T., and Wolfe L. L. 2004. Environmental sources of prion transmission in mule deer. *Emerging Infectious Disease* 10:1003-1006

Nichols, T.A., J.W. Fisher, T.R. Spraker, Q. Kong, and K.C. VerCauteren. 2015. CWD prions remain infectious after passage through the digestive system of coyotes (*Canis latrans*). *Prion* 9(5): 367-375.

Plummer, I. H., S. D. Wright, C. J. Johnson, J. A. Pedersen, and M. D. Samuel. 2017. Temporal patterns of chronic wasting disease prion excretion in three cervid species. *Journal of General Virology* 98:1932-1942.

Pritzkow, S., F. Moda, U. Khan, G.C. Telling, E. Hoover, and C. Soto. 2015. Grass plants bind, retain, uptake, and transport infectious prions. *Cell Reports* 11(8):1168-115, doi:10.1016/j.celrep.2015.04.036

Appendix I-B: CWD Resolution



Northeast Association of Fish & Wildlife Agencies, Inc.

RESOLUTION

Chronic Wasting Disease

WHEREAS, the Northeast Association of Fish & Wildlife Agencies, Inc. (NEAFWA) is extremely concerned about the potential spread of Chronic Wasting Disease (CWD) in the white-tailed deer population within the Northeast; and

WHEREAS, all available measures should be employed to prevent or contain the spread of CWD in the region; and

WHEREAS, CWD is one of a group of diseases called transmissible spongiform encephalopathies (TSEs), caused by an abnormal form of a cellular protein called a prion which accumulates in lymphoid and nervous tissue and can pass from the animal in its body fluids and waste; and

WHEREAS, native species, such as white-tailed deer, elk, moose, and mule deer, and non-native sika deer, reindeer and muntjac deer are known to be susceptible to CWD, and the full extent of susceptible cervids is unknown; and

WHEREAS, chronic wasting disease is inevitably fatal, but it often takes one or more years for symptoms to appear, and no treatment or vaccine is available; and

WHEREAS, a well-documented method of spreading CWD across long distances is the movement of live cervids for commercial purposes; and

WHEREAS, to date, CWD has been documented in wild or captive herds of white-tailed deer in five states (MD, NY, PA, VA, and WV) within the region;

NOW, THEREFORE, BE IT RESOLVED, that NEAFWA urges every state and province within the region to take all possible measures to prevent the additional introduction and further spread of CWD; and

That these measures should include (1) restrict or eliminate captive cervid operations or, at minimum, prohibit all interstate movement of animals from those herds; (2) prohibit the movement of intact carcasses of hunter harvested CWD-susceptible cervids from known CWD-affected areas; (3) restrict or eliminate products manufactured from captive cervids, including their urine; and (4) maintain prohibitions on feeding and baiting deer where it



Northeast Association of Fish & Wildlife Agencies, Inc.

RESOLUTION

currently is prohibited, and eliminate the practice of feeding and baiting deer elsewhere unless deemed necessary for managing overabundant deer population; and

If CWD is detected in any state or province within the region, NEAFWA urges strict adherence by that state or province to guidelines set forth in the NEAFWA Chronic Wasting Disease Plan (Northeast Association of Fish & Wildlife Agencies, Inc. 2006).

Adopted: October 29, 2014

Appendix I-C: Cervid Urine Resolution



Northeast Association of Fish & Wildlife Agencies, Inc.

RESOLUTION

The use of products that include natural deer urine, feces, or any other bodily fluid or excretion and the risk of chronic wasting disease

WHEREAS, free-ranging cervids, particularly the white-tailed deer, are an important and valuable wildlife resource held in public trust by state and provincial governments; and

WHEREAS, Chronic Wasting Disease (CWD) is a known threat to the health of the region's free-ranging deer resource and hunting heritage; and

WHEREAS, previous resolutions adopted by the Northeast Association of Fish and Wildlife Agencies, Inc. (NEAFWA) regarding CWD (<http://www.neafwa.org/resolutions.html>) have cited the risks of captive cervids on the region's free-ranging deer resource, and the North American Model of Wildlife Conservation, and urge every measure possible be taken to prevent the spread of CWD; and

WHEREAS, the United States Department of Agriculture's (USDA) Federal Rule regarding captive cervids and CWD does not adequately protect the free-ranging deer resource; and

WHEREAS, industry standards are voluntary, unenforceable, and cannot guarantee that products that include natural cervid urine, feces, or other bodily fluids or excretions are free of disease causing agents; and

WHEREAS, CWD prions have been detected in urine, feces, saliva, and other bodily fluids of pre-symptomatic cervids and remain infectious in the environment for many years; and

WHEREAS, CWD prions shed into the environment by CWD infected cervids are sufficient to transmit the disease to uninfected deer for many years in the absence of direct animal-to-animal contact; and

WHEREAS, there is currently no USDA-approved ante-mortem test for CWD or available commercial test to detect prions in urine; and

WHEREAS, regulatory authority of captive cervid facilities frequently lie within state and provincial agricultural departments which have a different mission than state and provincial fish and wildlife agencies and often are not given adequate resources to monitor captive cervid facilities or enforce captive cervid regulations; and

WHEREAS, the economic impact of hunting and the intrinsic value of free-ranging deer resources far outweigh that of the captive cervid industry; and



Northeast Association of Fish & Wildlife Agencies, Inc.

RESOLUTION

WHEREAS, alternative synthetic products are readily available and studies have shown they are equally effective;

NOW, THEREFORE, BE IT RESOLVED, that NEAFWA strongly encourages all state and provincial fish and wildlife agencies to work diligently to ban the use of natural-based cervid urine products and other bodily fluids in their respective jurisdictions.

Adopted: November 1, 2017

Appendix II. Frequently Asked Questions about CWD and NY State's CWD Risk Minimization Plan

Why are live deer or elk (cervids) a risk for CWD entry into New York?

The importation of live deer and elk from other states is a risk of CWD entry into New York State. The reason live animals are a risk is because live animals are not tested before they are moved. The USDA CWD Herd Certification Program includes certain testing requirements of carcasses for interstate movement of captive cervids, but has not yet approved a live animal test although there are several live testing methods that are currently in development. Each state has individual requirements for the movement of cervids into the state that may be more stringent than the USDA Certification Program. Despite this level of government regulation, since 2012 CWD has been detected 30 captive cervid facilities in nine states. Of these, nine facilities were enrolled in the USDA program and twelve had undergone at least five years of monitoring prior to CWD detection.

The long latency period of CWD without any clinical signs makes antemortem (live) diagnosis difficult. Postmortem testing is insufficient to detect disease before animal movement occurs. As a result, all CWD Certified herds operate on a "trust" system that deer producers are consistently testing all mortalities for five years to achieve a certified status and to be permitted to export live animals. During these five years, certified facilities are permitted to import animals into their herds so testing of dead animals does not reflect the true herd status. The delay in detection of CWD because of postmortem testing is unlike antemortem tests available for tuberculosis (*Mycobacterium tuberculosis*) or *Brucella* spp. where animals can be tested before they are moved to a new herd. Live animals may be moved to multiple herds (Romano 2012) and thereby infect many other animals and premises. Our Team concluded live animal movement presents an unacceptable level of risk. Recent convictions of prominent deer breeders in Texas and Missouri demonstrates the potential for smuggling or illegal movement to meet the demands of the industry. Prior to the live cervid import ban in New York, thirty facilities imported deer into New York from outside the state and 65% of these imports came from states now known to be CWD-positive, such as PA or WI.

In 2017, there were 197 active cervid herds with CWD-susceptible species recorded in NY by DAM. Of these operations, 96 (49%) were CWD Certified herds and 101 (51%) were Special Purpose (Monitored) herds (see sidebar for designations). There were 12 locations that have both CWD Certified and Special Purpose herds with the same owner. The risk associated with dual cervid facility ownership is that a visibly sick or CWD suspect deer could avoid mandatory testing in a Certified herd by being moved to a Special Purpose herd. From a 2012 survey, there were 30 (11%) locations that imported cervids from outside of New York State. There were 44 (16%) facilities that were identified as commercial shooting operations by either DAM field veterinarians or DEC biologists, but these businesses are not separately identified from the rest of the Special Purpose herds in regulation. Commercial shooting facilities often bring in large numbers of adult males in the course of their operations and this sex/age class often has the highest CWD infection rates (Miller et al. 2008). Fence quality on 42% of all facilities was ranked as low or medium. At least 38 (14%) of facilities had escapes and 11 were listed as unsuccessful in their

recovery. There were 42 (15%) facilities with DAM compliance issues. Only 60 (21%) of herds were known to be under the routine care of a veterinarian. Finally, for potential co-mingling activities, 11 (4%) had taxidermy businesses on site, 2 (<1%) engaged in wild deer rehabilitation which is illegal under current regulations, and 72 (26%) butchered deer on site. The Oneida County CWD outbreak in 2005 was at a captive deer facility where the owner mixed taxidermy and deer rehabilitation activities together so NY has taken steps to limit co-occurrence of these activities. This captive facility was designated as Special Purpose (Monitored) and conducted required testing. The subsequent epidemiological investigation revealed CWD-positive animals in the facility and in the wild.

CWD-Certified Herd	Special Purpose (Monitored) Herd
Live animal imports	Live animal imports
Live animal exports	No live exports
Official and visual identification requirement	No identification requirement
Restraint system*	No restraint system
CWD testing for all natural mortalities of animals >12-months-old	CWD testing for 10% of herd up to 29 animals; ≤9 animals does not include lethal sampling
Typically breeding herds	May include commercial fenced hunts

*From publication of the new rule (Oct. 15, 2013) forward, all new CWD-certified herds will be required to have a restraint system.

Why are deer carcasses and parts a risk for CWD entry?

Prions are found throughout the body, but are in higher concentrations in specific tissues, such as the brain, spinal cord, tonsils, lymph nodes, spleen, and intestinal tract (Williams 2005). Disposal of deer carcasses by hunters is not easily regulated in New York. A deer carcass that is disposed of on the landscape where it is available to scavengers and wild deer presents a risk because prions are not easily degraded and can remain viable for an undetermined amount of time [>16 years for scrapie prions (Georgsson et al. 2006)]. Prions bind to soil particles and remain infectious and prions can be taken up by plants (Pritzkow et al. 2015). Scavengers may transport prions in feces (VerCauteren et al. 2012, Nichols et al. 2015). A minimum of 54,000 deer are taken to taxidermists and processors each year in New York and of those, an estimated 3-5% (>2000) are deer harvested from outside the state. When conducting a 2012 survey of deer hunting businesses in the state, DEC biologists found that many deer processors and taxidermists were unaware that DEC’s solid waste regulations applied to their businesses for waste disposal (Appendix V). For disposal, 50% of businesses used a landfill, 25% used rendering services exclusively, and 15% indicated they composted, used a pit, or otherwise left carcasses on the landscape where they could be encountered by wild deer and present a risk of disease transmission to wild deer. The remaining 10% used a variety of methods, with <1% choosing incineration. Our concern is that 25% of businesses (those not using landfills or rendering) were disposing of waste with a method that made prions directly available to wild deer.

Why are products that contain deer fluids (urine) a risk for CWD entry?

Deer infected with CWD begin shedding prions in urine more than a year before they appear ill (Plummer et al. 2017), resulting in thousands of prion infectious doses over the course of CWD infection (Henderson et al. 2015). Urine is collected from captive cervids in catch pens that also contaminate urine with feces and saliva, which also have prions (Angers et al. 2006, Angers et al. 2009, Mathiason et al. 2006, Plummer et al. 2017). Extensive movement of animals and limited and delayed testing make captive cervids a high risk for CWD. Nationally, CWD continues to be found at captive cervid facilities in increasing number [2013 – 1, 2014 – 5, 2015 – 6, 2016 – 8, 2017 – 11]. Urine from captive cervid producers may be batched from multiple locations by a vendor for retail sale, in which urine from one CWD-positive animal may contaminate multiple products. Urine products are distributed across the country via retail, internet, and catalog sales. Urine production and sales is not regulated by any agency, nor are there any testing or marking requirements. There is currently no rapid, cost effective test to determine if collected urine contains prions (John et al. 2013). If cervid urine containing prions is put on the landscape by deer hunters, in a scrape or other area used by cervids, prions may bind to soil and contaminate that location for years or decades. Plants are capable of binding prions on leaves and taking up prions into their tissues; those prions remain infectious (Pritzkow et al. 2015). Cervids attracted to that location have the potential to then ingest prions in plants or soil and become infected. There is no “safe” dose of prion; exposure to one prion may be enough to cause infection (Fryer and McLean 2011). Alaska, Vermont, Virginia, and several Canadian provinces have already banned natural cervid urine for hunting because of the risk of CWD. There are 92 known companies that produce 824 urine-related products, 20% of which are synthetic products that do not contain natural deer urine, so safe alternatives are available to hunters.

Additional details about the CWD risks associated with cervid urine products are provided in Appendix I (Summary of Comments, Action 1.1.2) and Appendix I.A (CWD Risk Related to Cervid Urine Products).

Why are live wild white-tailed deer a risk for CWD entry?

Chronic wasting disease in Pennsylvania was detected <100 miles of the New York border. Although the average dispersal distance for yearling bucks is less than 40 miles, deer have been documented traveling longer distances (Long et al. 2008). High deer densities may expose more animals and dispersal by juvenile animals may spread disease further toward NY. In addition, the epidemiological investigations from infected captive facilities in Pennsylvania and Ohio were incomplete, raising the possibility that there may be other unidentified exposed herds in Pennsylvania. Pennsylvania has over 1,100 captive cervid herds and Ohio has 540 captive herds distributed statewide.

Why is the area where CWD was detected in New York in 2005 still a risk?

Prions bind to the soil and remain infectious for many years (Georgsson et al. 2006). They can also be taken up in to plant tissues and remain infectious (Pritzkow et al. 2015). Prions are shed in feces, urine, and saliva of infected deer. Carcasses also contain prions in various tissues. Ingestion of soil contaminated with prions by a deer could cause an infection. While no other cases of CWD have been found in New York since 2005, it is possible that there is environmental contamination that remained infectious for an unknown period of time in the area where these positive deer were found.

Why is rehabilitation and release of wild deer a risk?

Wildlife rehabilitators in New York take in both adult and young-of-year (fawn) deer. Often, these deer are moved around the state with very little tracking. In 2012, 35% of deer taken in by wildlife rehabilitators were moved by the public or by the rehabilitator further than the closest rehabilitator, with a number of deer being moved over 50 miles. Movement of these animals presents a potential for diseases to spread to new areas of the state. Once in captivity, wild deer may be commingled with other wild deer being held, increasing contact rates and the likelihood of the property becoming a disease amplifier. Deer are also transferred between rehabilitators. From 2012 through 2014, 129 adult white-tailed deer and 1138 fawns were accepted by wildlife rehabilitators. The release rate for adults was 25% and 38% for fawns during this time period. Deer released after rehabilitation are currently not required to be identified or tracked.

Why is escape of captive deer into the wild a risk for exposure to New York's wild white-tailed deer?

Horizontal transmission through nose-to-nose contact is sufficient to transmit CWD. The longer an infected captive deer interacts with wild deer, the greater the chance of disease transmission. A deer that escapes captivity may not remain identified and therefore, cannot be easily distinguished from wild deer. Recapture can be very difficult or impossible. Many captive facilities, including the fenced shooting operations that offer hunting commercially, do not have an identification or inventory requirement, so these captive deer could be unaccounted for indefinitely. Based on informally reported information (including publicly reported sightings of tagged deer outside of known facilities), in 2010, DEC responded to 18 escape incidents involving 23 captive animals. In 2012, DEC responded to 10 incidents involving 55 escaped captive animals; in one event, 35 animals escaped from the premises and all were not recovered. A certified herd owner has 72 hours to recapture the deer (J. Lewis, DAM, personal communication). However, they may be concerned that bringing an escaped deer back into the herd would result in a loss of certification status; through regulation, we have negatively incentivized the recapture of an escapee.

Why is intrastate movement of captive deer a risk to wild deer?

A permit from DAM is required for movement of live captive animals within New York, but live captive animals cannot be tested for CWD before being moved to new facilities. If a herd discovers CWD, DAM must conduct extensive epidemiological 'trace backs' to find out where deer on the facility came from and 'trace forwards' to determine where infected animals may have gone. Depending on the level of investigation, multiple levels of tracing may be required to account for all animals. This entire system is based on the accuracy of the records reported by the captive cervid owner and maintained by the DAM.

For example, Pennsylvania Department of Agriculture (PDA) has sole responsibility for the oversight of captive cervids in PA. PDA was unable to trace all of the exposed animals sold from the index herd in order to perform CWD testing. The reported identity of the index animal was contradicted by DNA testing, therefore, all suspected source herds were removed from quarantine (14 herds). The source of infection and origin of the index animal remains unknown. The index herd shipped animals out-of-state and those animals are unaccounted for. One of the animals from the index herd was illegally sold to an unpermitted facility where it escaped and remained at large for months. As of October 25, 2017, 25

[herds in PA are under quarantine](#) because they have purchased animals that were exposed or resided at a facility that had CWD. An assessment of the risk of CWD transmission in PA stated that the major limitation was “the vast amount of missing cervid data (due to data entry, geocoding errors or lack of an official ID)” (Romano 2012). Depending on state regulations, it may be difficult or impossible to completely reconstruct movement patterns of deer potentially exposed to CWD. Within NY, conducting trace-backs to imported animals requires a tremendous amount of time and effort by DAM.

Why is high density of wild white-tailed deer a risk for CWD exposure?

CWD is primarily transmitted from deer-to-deer through direct contact or from environments contaminated with infected carcasses, feces, saliva, or urine (Almberg et al. 2011). Therefore, CWD is transmitted both in frequency-dependent (based on how often the deer contacts a contaminated environment) and density-dependent (how often a deer encounters another deer) modes of transmission. Deer attracted to specific areas, such as mineral licks or bait piles, are more likely to encounter other animals at those sites and leave their infected body fluids behind on that site as well.

Why is a wild deer trophy head a different risk than a wild deer carcass?

Typically, hunters are most likely to want older adult males (bucks) prepared as a taxidermy mount. In states with CWD, adult males are up to twice as likely to be infected as females. According to taxidermy records, New York hunters traveled to western states, such as Colorado, Wyoming, and Kansas and harvested trophy deer that they brought back to New York. To illustrate this point, the known CWD-positive cases from captive deer in Oneida Co. were suspected of having been exposed to CWD through taxidermy waste material, likely from trophy cervid heads brought into New York from a CWD-positive state. Disposal of deer carcasses and parts on the landscape could make prions available to wild deer. The concentration of prions is highest in brain and central nervous system tissues. In addition, waste or byproduct material from taxidermy businesses that are not disposed of in a landfill may become a source of infection for wild deer. Deer shot on captive commercial fenced operations are of particular concern because adult male deer are brought in from multiple sources.

What are the currently banned states for whole carcass importation?



 Import to New York Prohibited

STATE	DEER SAMPLED 2013	ELK/MOOSE SAMPLED 2013	DEER POP EST 2013	2013 DEER HARVEST	SAMPLING GOAL	CLINICAL SAMPLES	HUNTER HARVEST	ROADKILL	REGS for TAXIS/PROC	URINE BAN?
Connecticut	0	0		13,000	300 in 2014	Y	Y	Y	N	Not likely
Delaware	583			14,263	same in future	Y	Y	N	N	No, education for hunters
Maine	504	11	200,000	24,795	same in future	Y	Y	Y	N	News releases and hope to restrict in the future
Maryland	261		227,000	95,863	same in future	Y	Y	Y	Y-taxis, N-processors	No. Focus on education.
Massachusetts	6 (1 captive fallow, 2 WTD, 1 roadkill WTD, 2 illegal PA WTD)	1 (emaciated)	100,000	11,566	same in future	Y	N	N	N	No internal discussions
New Hampshire	405		113,300	12,540	400 annually and clinical suspects	Y	Y	N	N	Hoping to ban. Publishing info.
New Jersey	514		105,535	51,595	same in future	Y	Y	N	N	No
New York	2597 (88 clinicals)	1	960,000	243,567	same in future	Y	Y	N	N	Assessing risk; educating hunters
Pennsylvania	5114	73 elk		352,920	same in future	Y	Y (4105)	Y (930)	N	Yes, regulated in DMAs
Quebec	1130	16 moose (clinical)	400,000	61,067	not sure - funding	Y (12)	Y (733)	Y (385)	N but could	Maybe in 5 years
Rhode Island	178		15,000	2458	same in future	Y	Y	Y	Y	Under consideration only
Vermont	8	1	135,000	14,000	same in future	Y	N	N	N	Oct. 2014 - planning to ban natural deer urine
Virginia	406		945,000	244,440		Y	Y (CA)	Y (CA)	Y	2015 plan for urine ban, education for hunters now

STATE	CAPTIVE CERVIDS?	# CAPTIVES	SHOOTING OPS	CAPTIVE IMPORTS?	TESTING CAPTIVES	AGENCY REG CAPTIVES
Connecticut	Y		N (allowed, but 12 none exist)	N	No	Dept. of Ag
Delaware	Y	7 (3WTD, 1Sika, 2 fallow, 1 red deer)	N	N	All cervids >1.5 yrs old tested	FW for native, Ag for non-natives
Maine	Y	74 farms	Y	Y (except WTD)	Test all that die or killed (>12 mon) or show clinical signs	Dept. of Ag
Maryland	Y	11 with 150 animals	N	N	Test any animals that die	FW
Massachusetts	Y	10 (no WTD)	N	N	Test all deer that die or are killed	FW
New Hampshire	Y	16 farms	N (1 grandfathered)	Y (non-native only, no intrastate transfers)	Voluntary herd certification	FW for native, Ag for non-natives
New Jersey	Y		14 Y (archery only)	N	No, owners report suspicious mortality	Wildlife
New York	Y	279 in 2012	Y (at least 44)	N	Cert. -Morts >12 mon., Monitored - 10% up to 30	FW and Ag for WTD, Ag for all others
Pennsylvania	Y	1100	Y	Y	2,200 of 25,000 tested 2013	DOA
Quebec	Y	170 with 9477 cervids	Y	Y	All slaughterhouse and voluntary program	FW regulated but DOA tests
Rhode Island	N		0	N	None exist	FW
Vermont	Y	16 farms (2 reg by FW, 14 by Dept of Ag)	Y (non-native)	Y	Test all harvested susceptible spp.	FW and Dept. of Ag
Virginia	Y	16 (no farms, mostly exhibitors)	Y (4 grandfathered, 3 active)	N	Samples from all captive cervids	FW

Appendix IV

New York State Department of Environmental Conservation Bureau of Wildlife Protocol for Reported Captive Cervids at Large (Appendix to CWD Manual)

Background

Many species of deer and elk, the family Cervidae, may be legally held in captivity under permits issued by the NYS Department of Agriculture and Markets. As of October 2002, Agriculture & Markets estimates that less than 1,000 animals in this family are held in NY on about 150 premises. These animals of unknown origin at large in the state pose a disease risk (tuberculosis, brucellosis, chronic wasting disease) to wild and other captive cervids, and therefore such animals at large should be removed from the wild.

Legal Authorities

ECL 11-0325 Control of dangerous diseases. The Commissioner of Agriculture and Markets certified on December 22, 1999 that the running at large of Cervids of unknown origin and unknown health status posed an imminent danger of introducing disease into the State, endangering the health and welfare of wildlife and domestic livestock. Further, 6 NYCRR Part 189 authorizes Department staff to undertake appropriate measures to control the risk of introduction or spread of chronic wasting disease. Under this regulation the following cervids have been identified as a potential threat. The Genus *Cervus* meaning the following species and hybrids: Thorold's Deer (*C. albirostris*), Visayan Deer (*C. alfredi*), Barasingha (*C. duvaucelii*), Elk (Red Deer, Wapiti) (*C. elaphus*), Eld's Deer (Thamin) (*C. eldii*), Philippine Sambar (*C. mariannus*), Sika Deer (*C. nippon*), Schomburgk's Deer (*C. schomburgki*), Sunda Sambar (*C. timorensis*) and Sambar (*C. unicolor*). The Genus *Odocoileus* meaning the following species and hybrids: Mule Deer (*O. hemionus*), Black-tailed Deer (*O. hemionus columbianus*) and White-tailed Deer (*O. virginianus*). And the Genus *Alces* meaning the following species and hybrids: Moose (*Alces alces*).

These species, and all other cervids (including Fallow Deer (*Dama dama*)) also pose a risk of introduction or spread of tuberculosis that could endanger the health and welfare of wildlife and domestic livestock. The following protocol should be applied to all at-large cervids.

Protocol

1. When an observation of a captive Cervid at large is reported, determine the date, time, location, and nature of the observation from the person reporting it. Ask for any information regarding the sex of the animal, condition/behavior (i.e. health) and if the animal had any type of identifying tag. Thank the caller for reporting their observation, and explain that DEC will check with Agriculture and Markets to attempt to locate the owner. Advise them that certain Cervids such as elk are protected under New York law and cannot be hunted, but the State may remove them from the wild as a protective measure because of concerns that these animals of unknown origin pose a disease risk to wild deer and to deer and elk legally held in captivity.
2. If the circumstances regarding condition/behavior of the animal cannot be determined by phone, than a direct inspection of the animal and location should be attempted as soon as possible.
3. When reliable reports of animals at large are received, staff should notify Agriculture and Markets and make reasonable attempts to locate the owner of the escaped animal. If

observation of the animal shows no outward signs of disease, the owner will be allowed 48 hours to attempt to recapture his animal and return it to his premises.

4. If the animal at large is **exhibiting signs of illness or disease, removal of the animal from the wild will be considered a priority and options for live capture will not be considered.** To preserve tissues needed for pathological examination, head shots should be avoided if possible.
5. If the animal at large is not exhibiting signs of illness or disease, but the owner cannot be located, or if the owner is unwilling or unable to recapture the animal, DEC staff, Agriculture and Markets staff, or any law enforcement officer in the area will be authorized to destroy the at large animal.
6. If the at large animal is on private property, permission to access and collect the animal should be secured from the landowner or his agent via a signed written permission form or letter. If permission is denied and the animal exhibits signs of disease, staff shall notify Central Office for assistance in seeking legal authority for such entry and collection.
7. All animals killed will be removed from the site and submitted for necropsy by a wildlife pathologist or Agriculture and Markets veterinarian. Arrangements should be made to have the carcass immediately transported to a wildlife pathology unit, either the Wildlife Pathology Unit at the Wildlife Resources Center in Delmar or the Wildlife Services Unit at Cornell University in Ithaca. A copy of any and all investigative reports should accompany the carcass. Keeping the carcass cool will be required if there is a delay in transporting the specimen.
8. Handling procedure of the animal at large exhibiting clinical signs of illness or disease should follow those recommended by the NYS Department of Health protocol for rabies. Rabies is extremely rare in cervids but does occur. Additionally, all at large animals will be tested for rabies, chronic wasting disease or tuberculosis where applicable.
9. The following parties shall be kept apprised of plans and results of any response to an “At Large Cervid” situation: Regional Wildlife Manager, Regional Captain of Law Enforcement, Regional Director, Regional CP Specialist, Regional Agriculture & Markets veterinarian, Director of DFWMR, Chief Bureau of Wildlife, Director of Law Enforcement, Program Attorney for DFWMR, Press Officer, Wildlife Pathology Unit, Director of Animal Industry Agriculture & Markets. Primary responsibility for communications will lie with the Regional Wildlife Manager.

Recommended Disposal Options for Deer Carcasses and Parts

Placing deer carcasses and parts in a landfill is the best option for disposal of this waste and the preferred method in this plan. Deer waste can be generated by hunters directly, by hunters via deer processors and taxidermists, or by highway departments who pick up road-killed deer, but could also come from a targeted surveillance collection if CWD is found. Regulated sanitary landfills routinely cover their waste (at least once per day), minimizing the it is exposed to scavengers and the elements. Additionally, sanitary landfills are designed to contain any leachate with a system of liners, with this material ultimately going to a waste water treatment plant (although this type of treatment itself does not render prions inactive). Placing deer waste in a regulated sanitary landfill is nevertheless the safest, most practical, and most accessible means of disposal currently available to hunters, taxidermists, deer processors, and highway departments.

There are 26 sanitary landfills in New York, all regulated and permitted under NYCRR Part 360 (Figure 1). In the spring of 2014, we contacted all of the individual landfill operators to determine their willingness and ability to accept deer waste. In addition to discussing facility constraints and operating procedures, we also shared DEC's CWD plan and our approach to more strongly encourage hunters to dispose of deer carcasses and parts in the waste stream. All the landfills indicated they would accept deer waste, although conditions varied under which they would do so (Table 1). Most of the facilities also indicated they would assist DEC with larger scale disposals (sharpshooting, staff collections, etc.) if necessary. About half of the state's sanitary landfills are county operated, and half privately run.

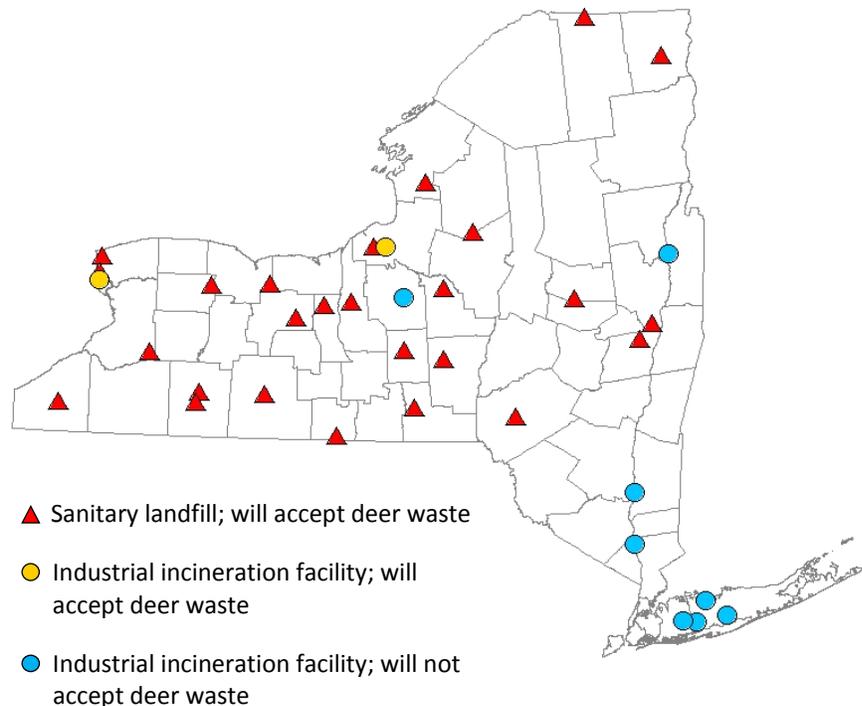


Figure 1. Locations of NY sanitary landfills and DEC-regulated industrial incineration facilities

Deer carcasses and parts can also be disposed of by incineration. It's important to note however, that incineration by itself is not a complete disposal method; the resultant ash needs to be then deposited in a sanitary landfill, albeit in much reduced volume. There are ten industrial incineration facilities in the state regulated by NYSDEC (Figure 1). In the summer of 2014, we contacted all of these facilities to determine their willingness and ability to accept deer waste. Only two were willing and able to do so (Table 1).

Reasons for negative responses to incineration varied, but could be grouped into four categories:

- 1) Their contract with another regulatory entity (not DEC) precludes it;
- 2) Due to their size and composition, deer carcasses do not fully combust;
- 3) They are located in a residential area or otherwise concerned about negative reactions from people, including staff;
- 4) Small size of their facility limits the overall volume they can accept

Due to the greater number of facilities, their accessibility, and intake volume that landfills afford as compared to industrial incineration facilities, we recommend landfilling as the preferred method of disposal for deer and deer parts in New York. Nothing in the preceding statement, however, would preclude us from using incineration as an additional disposal method in the future if we so choose.

Table 1. New York's sanitary landfills and industrial incineration facilities, grouped by their policies on acceptance of deer waste (red & yellow = will accept, blue = will not accept)

Facility Type	Policy	Facility	County	Town	DEC Region
Sanitary Landfill	Will take carcasses and parts; prior notice for large volume (62%)	Colonie Sanitary Landfill	Albany	Colonie	4
		Clinton County Landfill	Clinton	Black Brook	5
		Broome County Landfill	Broome	Nanticoke	7
		Auburn Landfill No. 2	Cayuga	Auburn	7
		Chenango County Landfill	Chenango	Pharsalia	7
		Cortland Co. Westside Extension Landfill	Cortland	Solon	7
		Madison Co. Westside Extension Landfill	Madison	Lincoln	7
		Chemung County Sanitary Landfill	Chemung	Chemung	8
		Seneca Meadows Landfill	Seneca	Seneca Falls	8
		Bath Sanitary Landfill	Steuben	Bath	8
		Chautauqua Landfill	Chautauqua	Ellery	9
		Modern Landfill	Niagara	Lewiston	9
		Ontario County Sanitary Landfill	Ontario	Seneca	8
		Allegany County Sanitary Landfill	Allegany	Angelica	9
		Ava Landfill	Oneida	Ava	6
Hyland Landfill	Allegany	Angelica	9		
Facility Type	Policy	Facility	County	Town	DEC Region

Sanitary Landfills	Will take carcasses, parts, and large volume; prior notice needed for all (15%)	Franklin County Regional Landfill	Franklin	Constable	5
		Fulton County Landfill	Fulton	Johnstown	5
		Devel. Authority of the North Country Landfill	Jefferson	Rodman	6
		Bristol Hill Sanitary Landfill	Oswego	Volney	7
	Will take carcasses and parts; paperwork needed for large volume (15%)	High Acres Western Expansion Landfill	Monroe	Perinton	8
		Mill Seat Sanitary Landfill	Monroe	Riga	8
		Chaffee Landfill	Erie	Sardinia	9
		Allied Waste Niagara Falls Landfill	Niagara	Niagara	
	Will take some carcasses and parts with prior notice; no large volume (4%)	Albany Rapp Road Landfill	Albany	Albany	4
	Will take parts and carcasses, but no large volume (4%)	Delaware County Solid Waste Management Facility	Delaware	Walton	4
Incinerators	Will take, but may limit amount/day (10%)	Oswego County Energy Recovery Facility	Oswego	Volney	7
		Covanta Niagara, L. P.	Niagara	Niagara Falls	9
	Will not take carcasses or parts (80%)	Hempstead Resource Recovery Facility	Nassau	Hempstead	1
		Babylon Resource Recovery Facility	Suffolk	Babylon	1
		Covanta MacArthur Renewable Energy	Suffolk	Islip	1
		Huntington Resource Recovery Facility	Suffolk	Huntington	1
		Dutchess County Resource Recovery Facility	Dutchess	Poughkeepsie	3
		Wheelabrator Westchester	Westchester	Peekskill	3
		Wheelabrator Hudson Falls	Washington	Kingsbury	5
		Onondaga County Resource Recovery Facility	Onondaga	Onondaga	7