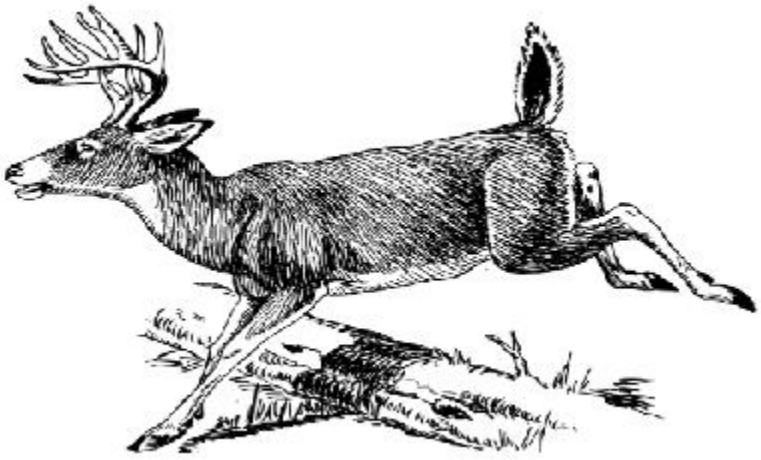
Chronic Wasting Disease Response Plan

Iowa Department of Natural Resources
2025 - 2030



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EXECUTIVE SUMMARY

This plan outlines the Iowa Department of Natural Resources (DNR) comprehensive strategy for managing Chronic Wasting Disease (CWD) in Iowa's wild white-tailed deer population over the next five years. CWD, a fatal neurological disease, poses a significant threat to white-tailed deer, Iowa's most culturally and economically impactful wildlife species. Given the persistent obstacles to eradicating CWD, this plan shifts focus towards mitigating its spread and managing its impacts through informed, science-based strategies.

The overall objective of Iowa DNR's CWD Response Plan is to **document the spread of the disease while balancing deer herd health with quality hunting opportunities, for as long as possible, while preparing Iowans for our future with CWD.**

The plan emphasizes adaptive management, recognizing the evolving nature of CWD and the need for flexible responses. Key components include:

- Surveillance and Monitoring: Utilizing a weighted surveillance protocol to prioritize high-risk areas and maximize the efficiency of sample collection. This includes partnerships with hunters, taxidermists, and other stakeholders to ensure robust data collection.
- Diagnostic Testing: Employing validated diagnostic tests, such as ELISA and IHC, through partnerships with the Iowa State University Veterinary Diagnostic Laboratory and the USDA National Veterinary Services Laboratory, to ensure accurate and timely disease detection.
- Harvest-based Management: Implementing targeted management strategies, such as Deer Management Zone Hunts and Incentive Hunts, to control deer populations in CWD-affected areas, when appropriate.
- Policy and Regulation: Maintaining and enforcing existing policies, including the ban on hunting over bait, interstate carcass transport restrictions, and regulations for hunting preserves, to minimize disease transmission.
- Public Education and Outreach: Collaborating with Iowa State University Extension and Outreach to deliver effective communication and education programs, fostering public awareness and participation in CWD management.
- Stakeholder Engagement: Continuing to engage with diverse stakeholder groups, including hunters, landowners, and agricultural producers, through the Deer Study Advisory Committee and DNR Listening Sessions, to ensure management decisions reflect public concerns and values.

The Iowa DNR aims to responsibly steward the state's deer population, balancing disease management with the preservation of Iowa's hunting tradition and ecological integrity. By prioritizing data-driven decisions, stakeholder collaboration, and adaptive strategies, this plan seeks to minimize the impact of CWD on Iowa's natural resources and encourage a sustainable future for its white-tailed deer population.

GLOSSARY OF TERMS

Bait (in hunting context): Grain, fruit, vegetables, nuts, hay, salt, mineral blocks, or any other natural food materials; commercial products containing natural food materials; or by-products of such materials transported to or placed in an area for the intent of attracting wildlife.

Cervid: A member of the deer family, including deer, elk, moose, and reindeer.

Chronic Wasting Disease (CWD): A fatal, contagious neurological disease that affects cervids.

Depredation: Damage caused by wildlife, particularly to agricultural crops.

ELISA (Enzyme-Linked Immunosorbent Assay): A laboratory technique used to detect and measure antibodies, antigens, and other substances. In this context, it is used as an initial screening test for CWD.

Endemic: Regularly found among particular subjects or in a certain area. In the context of CWD, refers to areas where the disease is consistently present.

Geographic Distribution: The spatial pattern of where a species or disease is found.

IHC (Immunohistochemistry): A laboratory technique used to detect specific antigens in tissue samples. In this context, it is used as a confirmatory test for CWD.

Lymph Nodes: Small, bean-shaped structures that are part of the body's immune system. In the context of CWD, the medial retropharyngeal lymph nodes are commonly used for disease testing.

Natural Resources Commission (NRC): A group of appointed citizens within the Iowa DNR that provides policy oversight over Iowa's natural resource protection and enhancement efforts.

Obex: A caudal part of the brain stem, used for CWD testing when lymph nodes are not available.

Pre-clinical Period: The stage of a disease before symptoms appear.

Prions: Proteins that reside on the surface of brain cells. Infectious prions can cause transmissible spongiform encephalopathies (TSEs), including CWD.

Prevalence: The proportion of a population that has a particular disease at a specific time.

Retropharyngeal Lymph Node: Lymph nodes located in the back of the throat, commonly used for CWD testing.

Spillover: The transmission of a disease from one species to another.

Transmissible Spongiform Encephalopathy (TSE): A group of progressive, fatal neurological diseases that affect the brain and nervous system of animals and humans including Bovine Spongiform Encephalopathy (Mad Cow Disease), Scrapie, and Creutzfeldt-Jakob Disease.

Weighted Surveillance: A disease monitoring strategy that assigns different values to samples based on the perceived disease risk of sex-age categories, prioritizing samples from higher-risk individuals (e.g., adult bucks).

INTRODUCTION

Prelude

The mission of the Iowa Department of Natural Resources (DNR) is to conserve and enhance our natural resources in cooperation with individuals and organizations to improve the quality of life in Iowa and ensure a legacy for future generations. Chronic Wasting Disease (CWD) poses a significant challenge to conserving and enhancing Iowa's white-tailed deer, one of the state's most culturally and economically important wildlife species.

The negative consequences of CWD in Iowa's white-tailed deer extend beyond biological impacts, potentially altering attitudes and experiences related to Iowa's natural heritage. Although the risk of a disease spillover into humans is currently unknown, perceived health risks associated with hunting CWD-infected deer can lead to changes in hunter behavior, causing potential adverse effects on agriculture, the timber industry, vehicle collision rates, suburban conflicts, natural plant communities, and local economies.

The objective of this plan is to provide a comprehensive framework to guide the management, monitoring, education, and outreach of CWD in Iowa over the next five years. This timeline underscores the importance of remaining adaptive to emerging techniques and research, as well as providing opportunity for reassessments in light of the inevitable spread of CWD in Iowa. This document outlines the various operations, strategies, and efforts of the Iowa DNR related to CWD. This plan also seeks to emphasize accountability through the evaluation of past and current successes and challenges, stressing the need for adaptive solutions in light of new information and changing circumstances.

Given the complicated nature of CWD, disease mitigation efforts have proven challenging in affected areas. Despite scientific approaches to harvest-based management, strategic monitoring and surveillance, and regulatory policies promoting best practices, geographic distribution and prevalence of CWD continue to increase across North America. Therefore, this plan seeks to redefine success in CWD-related efforts as not measured by the infeasible eradication or cessation of CWD in Iowa. Rather, the DNR will strive to use the best available science to mitigate the spread of CWD in Iowa's deer population through the responsible use of departmental resources, ensuring that management practices are carefully balanced to consider the overall health of the resource and longstanding tradition of quality deer hunting in Iowa.

Background Information

CWD is an infectious disease of cervids that has been detected in captive or free-ranging populations of deer, elk, moose, and reindeer in the United States, Canada, Norway, Finland, Sweden, and South Korea. This disease was first identified in 1967 in a herd of captive mule deer maintained at a research facility in Fort Collins, Colorado. Since then, it has been detected in free-ranging mule deer, white-tailed deer, elk, and moose in at least 36 states and four Canadian provinces within North America. Since 2016, it has also been detected in free-ranging reindeer, moose, and red deer from northern Europe. Though South Korea imported CWD-positive elk in the mid-1990s, spillover into wild populations of native cervids remains undocumented.

CWD is a transmissible spongiform encephalopathy (TSE), named for the plaques or "holes" that accumulate in the brain with advanced disease. These lesions produce the classic signs of CWD such as progressive weight loss, abnormal behavior, and drooling. These signs can also increase the likelihood of other causes of mortality such as aspiration pneumonia, vehicle collisions, or predation. Other TSEs of animals include scrapie in sheep and goats, transmissible mink encephalopathy in farmed mink, bovine spongiform encephalopathy ("mad cow disease") in cattle, as well as Creutzfeldt-Jakob disease and others in people. Importantly, TSEs are a group of diseases that worsen over time and are always fatal.

CWD spreads when normal proteins found in the body, called prions, misfold and become self-propagating such that they accumulate in tissues and cause disease. As they get released in excreta they can also infect others. Deer are most at risk of infection when prions enter their system through oral or nasal fluids (i.e., direct transmission). After infection, prions first accumulate in the lymph nodes that drain the head, especially the medial retropharyngeal lymph node, which is commonly used for disease testing, before spreading throughout the body. Infected deer can start releasing prions in their saliva within three months and in their urine by six months (Henderson et al. 2015). Prions have also been found in feces, blood, antler velvet, and semen (Mathiason et al. 2006, Angers et al. 2009, Tamgüney et al. 2009, Kramm

et al. 2019), creating multiple ways the disease can spread even before clinical signs appear. For 16 months up to three years, deer may appear healthy and behave normally while shedding infectious prions on the landscape, making disease management especially difficult since transmission can occur through direct contact or exposure to a contaminated environment.

CWD surveillance began in Iowa in 2002 in response to detections of the disease in neighboring states, namely Wisconsin (Table 1). In 2013, Iowa's first positive case of CWD in wild white-tailed deer was detected and confirmed in Allamakee County located in northeast Iowa. Since 2013, a minimum of 4,000 individual deer have been sampled, including deer from every county, on an annual basis. As of 2025, CWD has been found in wild deer within 29 counties and in captive deer within six counties in Iowa.

To date, other state agencies have attempted management of CWD by targeting three broad aspects of the disease ecology: changing the age structure, reducing densities, and preventing the creation of environmental reservoirs. However, states typically find an expanding geographic distribution and increasing prevalence despite these management approaches (Miller and Fischer 2016, Uehlinger et al. 2016). Regardless of strategy, the objective of any CWD response plan should be the responsible stewardship of the resource, with an emphasis on balance and sustainability.

It is now evident from case studies in other states that CWD can drive regional population declines. Edmunds et al. (2016) found that CWD-positive white-tailed deer from an endemic region of Wyoming had significantly lower survival, driving >10% population loss per year. Left unabated, this population was expected to go extinct within the next 50 years. Similar trends have been observed in Wisconsin, where CWD-positive white-tailed bucks have a 50% lower probability of annual survival within several endemic counties. Further, they estimate population declines once prevalence in adult does reaches 29%. Taken together, these findings reinforce the serious threat of CWD to preserving the long-term health of free-ranging cervids in North America, as well as a long, proud tradition of hunting and natural resource stewardship.

Iowa DNR Deer Program Overview

The Iowa Deer Program manages the white-tailed deer population through an engaged stakeholder process, which is reflected by the annual meeting of the Deer Study Advisory Committee. This committee includes a balanced number of stakeholder groups representing agricultural, recreational, and economic special interests. A series of DNR Listening Sessions is also held each spring to capture perspectives from members of other key stakeholder groups, such as hunters and landowners, which are summarized and provided to the Natural Resources Commission.

The Iowa Deer Program aims to manage county deer populations within an acceptable management objective, which balances quality recreational hunting and viewing opportunity with negative impacts such as property and crop damage caused by overabundance. While a majority of Iowa's counties are considered within management objectives, issues such as habitat availability, property access, disease, and contrasting landowner interests have the potential to exacerbate localized deer-human conflicts.

The Iowa DNR collects and maintains more data on white-tailed deer than any other wildlife species in the state. The Iowa Deer Program is able to inform management decisions based on a number of independent datasets: bowhunter observation report, reported deer harvest, deer-vehicle collision data, and spring spotlight survey counts. Fortunately, all of these data sources are collected annually at the county level. Due to relative strengths and weaknesses of each of these datasets, no single dataset is intended to be used exclusively. This system allows for county-based management to take place, a process which acknowledges that a "statewide" deer population is truly a composite of multiple regional deer populations that trend independently. For these reasons, managing a deer population on a statewide basis would inherently produce negative impacts to certain regional deer populations.

The Iowa Deer Program formally begins its annual management process by holding a series of DNR District Deer Meetings at the beginning of the year. These meetings are led by the State Deer Biologist and involve direct engagement with relevant DNR research personnel, depredation staff, field staff, and law enforcement officers within each geographic district. Prior to these meetings, the State Deer Biologist reviews population and harvest trends within each

county, using all available data to infer how each county deer population relates to management objectives. When appropriate, preliminary changes to harvest regulations (e.g., antlerless quotas, January antlerless seasons, buck-only restrictions, etc.) are proposed to guide discussion. A key component of this process involves insight from local staff, local hunters, landowners, and agricultural producers. This critical aspect of the meetings establishes an opportunity for local sentiment to influence final regulatory proposals, which emphasizes the model of engaging stakeholders and maintaining public trust. Ultimately, the Iowa Deer Program presents the final list of proposed regulatory changes to the Natural Resources Commission. If approved, these changes are incorporated into the regulatory framework for the subsequent deer hunting season.

Since deer management issues are not evenly distributed across the state, it remains critical to have a flexible regulatory framework that can be applied on a local scale. The future success of deer population management in Iowa relies on the ability to consider all available sources of data and public input through an engaged stakeholder process in order to guide county-based management strategies.

HISTORY OF CHRONIC WASTING DISEASE IN IOWA

1967

- CWD first identified in captive cervids in Colorado

1978

- CWD classified as a transmissible spongiform encephalopathy (TSE)

1981

- First detection in wild cervids (*Colorado, elk*)

2001

- First detection in wild white-tailed deer (*South Dakota)*
- Ban of hunting deer and turkey over bait first appears in Iowa DNR regulations

2002

- First detection in wild white-tailed deer east of the Mississippi River (*Wisconsin and Illinois*)
- Iowa DNR begins CWD surveillance efforts
- Iowa Department of Agriculture and Land Stewardship is granted authority over captive cervids in Iowa (DNR retains authority over wild and hunting preserve cervids)

2003

- Iowa legislature established Chronic Wasting Disease Task Force
- Iowa DNR develops first CWD Response Plan
- Midwest Fish and Wildlife Health Committee formed

2004

- Interstate carcass transport ban

2010

- Iowa DNR creates joint Chronic Wasting Disease Response Plan with the Iowa Department of Agriculture and Land Stewardship

2012

- First in-state detection in captive white-tailed deer

2013

- First in-state detection in wild white-tailed deer in **northeast Iowa** *(Allamakee County)*

2014

- Additional detections in Allamakee County suggest disease has become locally established

2015

- Scientific Collection Permits used to increase hunter harvest and CWD sampling in endemic area (2015-2018)

2016

- Switched to Lymph Node only sample collection for hunter-harvested wild cervids
- CWD detected in new county in **northeast Iowa** (*Clayton County)*

2017

- First CWD detection in **south central Iowa** (*Wayne County)*

2018

- DNR issues policy banning wildlife rehabilitation and rescue groups from accepting white-tailed deer for rehabilitation to prevent spread of CWD
- First use of Deer Management Zone Hunts for CWD affected areas
- First CWD detection in **east central Iowa** (*Dubuque County)*

2019

- Iowa DNR hires Wildlife Veterinarian
- CWD Research Consortium forms with Iowa DNR staff as active members
- First CWD detection in **west central Iowa** (*Woodbury County)*
- CWD detected in new counties in previously affected regions (*Decatur, Fayette, and Winneshiek counties)*

2020

- Weighted surveillance strategy piloted in Deer Management Zones
- Iowa DNR secures first two of a series of cooperative agreements with USDA APHIS's Chronic Wasting Disease Management and Response funding opportunities
- CWD detected in new counties in previously affected regions (*Appanoose and Jackson counties)*

2021

- Weighted surveillance implemented statewide
- CWD Incentive Hunt framework piloted in January (*Corydon*)
- CWD Ambassador Program begins in collaboration with Iowa State University Extension and Outreach
- Iowa DNR partners with Iowa State University Extension and Outreach to hire first CWD Outreach Specialists through USDA grant
- First CWD detection in **central Iowa** (*Greene County)*
- First CWD detection in **south western Iowa** (*Fremont County)*

2022

- CWD Incentive Hunts ran in January (*Corydon, Elkader, Harpers Ferry*)
- CWD detected in new counties in previously affected regions (*Grundy, Jasper, and Lucas counties)*

2023

- CWD Incentive Hunts ran in January (*Corydon, Elkader, Harpers Ferry*)
- Meskwaki Natural Resources announces first detection in wild deer harvested on Settlement land in Iowa
- CWD detected in new counties in previously affected regions (*Des Moines, Guthrie, Howard, Jones, Marshall, Monroe, Muscatine, and Tama counties*)

2024

- CWD Incentive Hunt run in January (*Corydon, Dubuque, Elkader, Harpers Ferry*)

- CWD detected in new counties in previously affected regions (*Cedar, Davis, Pottawattamie, Shelby, Story, and Wapello counties*)

2025

- CWD Incentive Hunts ran in January (*Corydon, Dubuque, Harpers Ferry*)

CWD-RELATED POLICY

Hunting Deer Over Bait

"Bait" is included as a prohibited device during deer hunting seasons. Iowa Admin. Code r. 571-106(11). Bait is defined as:

> "grain, fruit, vegetables, nuts, hay, salt, mineral blocks, or any other natural food materials; commercial products containing natural food materials; or by-products of such materials transported to or placed in an area for the intent of attracting wildlife."

As defined above, the term "bait" is specific to the activity of hunting and does not include food placed during normal agricultural activities nor for the intent of attracting wildlife in the absence of hunting.

Interstate Carcass Ban

Iowa law prohibits the importation of cervid carcasses into Iowa from a CWD endemic area, except for the meat from which all bones have been removed, the cape (skin), and antlers. Antlers may be attached to a clean skull plate from which all brain tissue has been removed. Iowa Admin. Code r. 571-104.21.

Hunting Preserves

The Iowa Department of Natural Resources (DNR) regulates captive cervids within high-fenced properties (≥ 8 ft.) that provide an opportunity for hunting (i.e., whitetail preserves, other ungulate preserves), while the Iowa Department of Agriculture and Land Stewardship (IDALS) regulates cervids on high-fenced properties used for cervid propagation, commonly known as deer farms. Iowa Admin. Code §§ 170.1A(2) and 484C.2(2).

Iowa Administrative Code outlines the regulatory framework relevant to the importation, transportation, and disease monitoring of captive hunting preserves. Iowa Admin. Code r. 571-104, r. 571-115.

For further guidance and protocols related to white-tailed deer hunting preserves, see Appendix.

Deer Rehabilitation Ban

In 2018, the Iowa DNR announced that it would no longer issue permits to groups that rehabilitate white-tailed deer. The goal of this policy is to prevent the potential spread of CWD to other deer treated at these facilities, as well as wild herds once rehabilitated deer are released back onto the landscape.

SURVEILLANCE AND MONITORING

Overview

Disease surveillance involves strategically sampling a subset of a population to detect, observe, and monitor infectious disease trends to inform control strategies. Early detection enables timely management interventions, potentially slowing disease progression and limiting geographic spread. Iowa's CWD surveillance strategies prioritize early detection through efficient and responsible use of resources. Since the onset of Iowa DNR's CWD surveillance program in 2002, efforts have aimed to balance broad geographic coverage with strategic focus on high-risk regions.

CWD surveillance in Iowa primarily relies on the voluntary sampling of hunter-harvested deer through the Statewide Surveillance Program and Hunter Submission Pathway. Opportunistic sampling of roadkill and suspect sick/injured deer also supports sampling goals, particularly in counties with lower deer harvest rates. Taxidermists represent an additional avenue to obtain high-value samples (i.e., adult bucks). Since 2022, a majority of tissue samples (80%) have been provided voluntarily through hunter harvest, with additional samples obtained from roadkill (17.5%) and dispatched sick/injured deer (2.5%).

History

Iowa's CWD Surveillance began in 2002, after CWD detections in wild deer in Wisconsin and Illinois marked the first detections east of the Mississippi River. Early CWD surveillance efforts were spatially comprehensive, with at least 94% of Iowa's counties being sampled each year (Table 1). Initial CWD surveillance efforts strategically concentrated on perceived high-risk regions, particularly in Iowa's northeastern corner due to its proximity to the initial CWD endemic zone in southwest Wisconsin. Between 2002 to 2013, four northeastern Iowa counties (Allamakee, Clayton, Dubuque, and Jackson) provided over 65% of deer sampled statewide. Sampling quotas were based on the total number of individual deer harvested. As other neighboring states reported positive samples near borders, sampling quotas increased for those counties including southeast Iowa counties adjacent to Missouri detections and western Iowa counties adjacent to Nebraska detections. After CWD detections in high-fenced facilities in Iowa, additional sampling quotas were prescribed in those areas as well, including Pottawattamie County, Davis County, and Cerro Gordo County.

In 2020, a weighted surveillance sampling protocol was initiated, beginning as a pilot program within CWD Deer Management Zones. The development of this protocol was informed by research from Jennelle et al. (2018), which quantified specific CWD risk-based values for various sex and age categories of deer.

In 2021, all Iowa counties were assigned annual, point-based sampling quotas according to perceived risk (i.e., proximity to confirmed detection of CWD). In CWD Target Surveillance Areas, larger quotas were implemented to enhance disease monitoring in established endemic regions. This weighted surveillance approach promotes efficiency by incentivizing samples from high value deer (e.g., adult bucks), which reduces associated staff time and testing costs while maintaining a statewide surveillance quota based on dynamic risks.

Protocol

Risk Assessment

Each Iowa county is assigned a CWD surveillance goal (i.e., sample quota) based on relative risk. Risk is assessed using the following factors in order of weight:

1. County is adjacent to a county with CWD detected in free-ranging wild deer
2. County has or is adjacent to a county with a nearby captive cervid facility in which a deer has tested positive for CWD
3. The total number of captive cervid facilities in the county
4. The annual proportion of hunters who reside in the county that reported harvesting a deer in a county with CWD in the wild.
5. The county borders a neighboring state
6. Estimated deer density for the county
7. Average estimated deer habitat suitability for the county
8. The total number of meat processors in a county
9. The total number of taxidermists in a county

Risk weights are calculated using the rank-sum formula:

$$w_i = (n - r_i) + 1$$

where w_i is the risk weight for factor i, n is the total number of factors (n = 9), and r_i is the mean rank of factor i. Risk points for each county are determined by multiplying the factor values by their respective weights. For binary factors (e.g., adjacency to a CWD-positive county), points are equal to the weight or zero. Continuous factors (e.g., number of facilities) are multiplied by the weights. The resulting risk points are standardized and summed to calculate each county's proportion of statewide risk.

County surveillance goals

Counties' risk proportions are multiplied by 3,000 points (to achieve 95% confidence of detecting at least one CWD-positive deer at 1.0% prevalence statewide). Point quotas are then rounded to 30, 60, 90, or 120 for field implementation. This approach balances surveillance efficiency with cost and logistics, enabling 95% confidence in

detecting at least one CWD-positive deer if prevalence ranges from 3.1% (with 30 points) to 1.0% (with 120 points) at the county scale, depending on the age and sex of deer tested within the county.

CWD-affected counties are excluded from this process and assigned separate quotas.

CWD Surveillance Program

The Iowa DNR implements an annual, statewide CWD surveillance strategy that combines weighted surveillance quotas for CWD-unaffected counties, targeted sampling quotas for CWD-affected counties, and specific disease surveillance protocols for detections in either wild or captive populations in designated Target Surveillance Areas. Annual CWD sampling seasons begin on April 1. There is no cost to hunters providing samples for this program. We exclude fawns from the surveillance program because they are the least likely to test positive for CWD due to their limited interaction with multiple deer and lowest risk of exposure to a contaminated environment.

- **CWD-unaffected counties**: Surveillance points are assigned based on the risk assessment process, totaling 3,000 points statewide. (see above for explanation of 3,000-point quota statewide).
- **CWD-affected counties** (outside Target Surveillance Areas): Weighted surveillance with a 150-point quota for each CWD-affected county.
    - In the event that a Target Surveillance Area encompasses a vast majority or all of a county, the county may be assigned a sample quota of 200 deer to accommodate a hybrid of the CWD-affected county and Target Surveillance Area approaches.
- **Target Surveillance Areas (wild population)**:
    - **Zones with >1 CWD-positive animal**: Collect 200 samples (excluding fawns) to estimate prevalence.
    - **Zones with a single CWD-positive animal**: Implement a weighted total quota of 750 points attainable over 3-5 years after initial detection. A quota of 750 points achieved over 3-5 years enables detection of at least one CWD-positive animal with 95% confidence if prevalence is approximately 0.1%. If no additional CWD-positive deer are detected once the 750-point quota is reached, we assume the Target Surveillance Area is effectively “free from disease” and the county will return to routine surveillance.
    - **Captive facilities**: Same approach as zones with a single CWD-positive animal above.

Point values for different sex-age categories based on disease potential (adults are defined as deer > 1.5 years old and yearlings as deer that are 1.5 years old):

- **Adult buck**: 3 points
- **Adult doe**: 2 points
- **Yearling buck**: 1 point
- **Yearling doe**: 0.5 points

On average, 1 sample equals ~2 points, with a 300-point quota corresponding to ~150 samples. Any samples collected from target/sick animals, collected as part of incentive hunts, or collected from shooting preserves will be in addition to any samples collected above. Point values are estimated using historical surveillance data in a proportional hazards model and are updated every 5 years.

Hunter Submission Pathway

The Iowa DNR has partnered with Iowa State University’s Veterinary Diagnostic Laboratory (VDL) to launch an accessible, decentralized option for testing hunter-harvested deer. The Hunter Submission Pathway allows both resident and nonresident hunters to submit deer samples for CWD testing, even if:

- The deer does not meet the DNR’s surveillance criteria (i.e. fawns), or
- The surveillance quota in the county/zone is already met.

Hunters can coordinate sampling by contacting their local Wildlife Biologist. If possible, hunters may also collect the samples themselves and send directly to the VDL. The Hunter Submission Pathway is available for hunters throughout all hunting seasons and generally provides expedited testing results compared to the Statewide Surveillance Program. The cost of testing through the VDL is $25 per deer, and payment can be made online through the CWD Testing Web Portal found on the Hunter Submission Pathway webpage.

Best Practices for DNR Staff

- **Sample early, sample often:** Consistent sampling efforts early in the season can alleviate pressure to meet sampling quotas during the gun deer seasons. While a vast majority of sampling is conducted during the gun seasons for efficiency sake, annual changes in hunter success, participation, and willingness to participate can lead to problems in high-quota counties. Therefore, staff are encouraged to consider many of the practices below for alternative sampling opportunities.
- **Roadkill**: Sampling roadkill deer is highly encouraged for all staff, though this practice can be particularly advantageous in counties with high sampling quotas and limited deer populations. Staff are encouraged to work with local Department of Transportation (DOT), law enforcement, and/or municipal departments for notification of roadkill throughout the year.
- **Hemorrhagic Disease Suspects**: While disease activity can fluctuate widely in location and intensity, samples collected from suspect mortalities can be opportunistically screened for hemorrhagic disease (Epizootic Hemorrhagic Disease and/or Bluetongue) and Chronic Wasting Disease concurrently.
- **Taxidermists:** Partnering with local taxidermists can be an efficient way to secure high-value samples from adult bucks. Staff working with taxidermists are encouraged to receive hunter consent prior to testing, which can be obtained by hunters filling out the provided ear tags at the point of drop-off.
- **Special Hunts:** Consider utilizing park hunts, urban hunts, block hunts, and depredation producers for access to higher number of hunter harvested deer in higher deer density areas or refuges.
- **Deer check stations:** Past attempts at deer check stations during regular seasons have produced limited success. However, special hunts (park hunts, urban hunts, etc.) offer an opportunity to obtain additional samples efficiently, particularly when a "check-in" is a required process of the hunt.
- **Drop-off Freezers:** Maintaining freezer locations during the hunting season can offer a passive avenue of sample collection, particularly during "slower" sampling periods (before/after gun seasons). Prior success utilizing drop-off freezers has relied on strategic location and communications to increase hunter awareness.
- **Timely Submissions:** Timeliness of submitting hunter-harvested samples is an utmost priority. Staff are encouraged to send hunter-harvested samples to the ISU VDL no later than one week after receiving that sample. It is preferable to mail samples early in the week to reduce waiting time and avoid delays caused by the weekend. While insulated foam shipping boxes are preferred, any secure mailing supplies (e.g., cardboard box, padded envelope) may be used when practical. If sending larger numbers of samples, submitting in lots or multiple of 90 (e.g. 180, 270) will facilitate quicker processing through the ISU VDL.

Diagnostic Testing

Overview

For all Iowa DNR CWD surveillance efforts, staff collect both medial retropharyngeal lymph nodes and associated metadata from each animal that includes the sex, age class, location of deer, and hunter information. Sampling efforts are focused primarily on hunter-harvested deer, with roadkill, taxidermy, and sick or suspect deer comprising other viable sample streams. For the Iowa DNR's CWD Surveillance Program, yearling (1.5 years) and adult (>2.5 years) deer are sampled; fawns are not typically accepted for DNR's surveillance unless the deer is sick or harvested during an incentive hunt.

Medial retropharyngeal lymph nodes are collected from each deer and each lymph node is placed in a labeled Whirl-Pak with a unique sample ID number - staff label one bag as the 'A' lymph node and the other as the 'B' lymph node. Staff retain and freeze the 'B' lymph nodes at each unit to ensure backup samples if necessary. If the medial retropharyngeal lymph nodes are not available for sampling due to trauma (e.g. head shot) or decomposition, staff may pull the obex to be sent in for sampling. However, DNR staff are encouraged to ship their 'A' samples weekly during the hunting seasons. Hunters who would like to submit their own CWD samples outside of the DNR CWD Surveillance Program may do so through the Hunter Submission Pathway, which utilizes the same diagnostic testing procedure.

Diagnostic Testing Procedure

The Iowa DNR utilizes a series of diagnostic procedures to screen tissues for chronic wasting disease at National Animal Health Laboratory Network (NAHLN)-accredited facilities like the Iowa State University Veterinary Diagnostic Laboratory (ISU VDL) in Ames, Iowa. Tissues are initially screened by enzyme-linked immunosorbent assay (ELISA), which uses

antibodies bound to a color probe to detect the presence of the misfolded prion protein that cause CWD. Samples that fall below an optical density threshold are considered test-negative and reported as "Not Detected." Samples that fall above this threshold are reported as "Initial Reactors" or "Suspects" depending on the diagnostic laboratory. At the ISU VDL, "Initial Reactors" will get retested using the original homogenate as well as a new homogenate derived from the lymph node in question. Consistent reactors are then forwarded on to the National Veterinary Services Laboratories, the regulatory laboratory overseen by the U.S. Department of Agriculture for confirmatory testing.

Confirmatory testing utilizes immunohistochemistry (IHC), which uses antibodies bound to an enzyme to visualize the deposition of misfolded prion proteins in thin slices of fixed tissue. This is considered the current gold standard for CWD diagnosis, however other ultra-sensitive assays are in the pipeline that may allow for detection of infected deer earlier in their disease course or contaminated environments. The Iowa DNR and others are exploring real-world applications of these diagnostics; however, they have limited commercial availability at this time. See the Current Research section for more information on projects that have used these assays in Iowa.

Following confirmatory testing, DNR staff inform hunters who harvested CWD-detected deer via phone call. They also make a courtesy call to meat lockers that have received positive deer for processing, however standard cleaning and sanitation procedures are currently deemed sufficient.

Future Considerations

Strategic disease surveillance remains critical for timely management responses. Additionally, ongoing monitoring of CWD prevalence within endemic regions may provide insights into the efficacy of management efforts. Given the expected geographic expansion of CWD in Iowa, adjustments to the scale and strategy of the CWD Surveillance Program may be necessary to maintain a focus on early detection. Factors such as county deer density, harvest rates, and other surveillance-related variables should be considered in future planning.

As these goals and strategies evolve, the Hunter Submission Pathway will remain a sustainable option for hunters to sample harvested deer.

DISEASE MANAGEMENT STRATEGIES

Overview

The Iowa DNR aims to manage deer populations in CWD-positive counties within the population management objective - which strives to avoid overabundance while maintaining a quality hunting experience. In certain counties, this may include additional, voluntary harvest opportunities. A deer population management objective is subject to vary by county depending on amount of suitable habitat, hunter and landowner tolerances, and various other factors. This strategy acknowledges that not all Iowa counties are appropriate for additional harvest-based management, and that managing county deer populations for quality hunting and viewing opportunities remains a persistent objective. However, the increasing prevalence and geographic spread of CWD threatens the future quality and health of deer throughout the state.

Protocol

The following protocol is to be used in CWD-affected counties. This protocol emphasizes responsible management, voluntary harvest opportunities, and appropriate engagement and collaboration among relevant stakeholders.

1. Evaluate county population status

   Assessing a county's deer population relative to the management objective relies on a combination of population and harvest data, along with insight from local DNR staff, hunters, and landowners. County deer populations are formally evaluated following the end of deer hunting seasons in January each year. The following data is synthesized to inform county deer population trends: spring spotlight survey, bowhunter observation survey, reported deer harvest, and reported deer-vehicle collisions. Winter aerial deer surveys may also be used opportunistically when additional data is sought.

   Additionally, the State Deer Biologist holds a series of staff meetings in each of the five wildlife management districts in the state. DNR personnel in attendance typically include local wildlife management staff, conservation officers,

depredation staff, and private lands staff. A key component of this process involves insight from local staff, often including personal observation and sentiment from local hunters, landowners, municipalities and agricultural producers. This critical aspect of the meetings creates a formal opportunity for local sentiment to guide final regulatory proposals, which emphasizes the model of engaging stakeholders and maintaining productive public relations.

The status of county deer populations is determined using two criteria: 1) population level relative to management objective and 2) current population trend. Both of these criteria are necessary to consider, as a county population considered within a management objective may be trending in a manner likely to exceed or fall below the objective in the absence of additional harvest measures.

Below are the general categories used to classify county population status:

- Above management objective: CWD-positive counties in this category are likely to receive additional antlerless harvest opportunities, particularly at a county-wide scale. Relatively high deer densities are likely increasing disease transmission potential, therefore further antlerless harvest may be necessary.
- Within management objective: CWD-positive counties may receive additional antlerless harvest opportunities, if appropriate, depending on current population trend. Unless disease prevalence appears widespread within a county, any additional antlerless harvest opportunities will likely occur at the sub-county scale.
- Below management objective: CWD-positive counties are unlikely to receive additional antlerless harvest opportunities, particularly at a county-wide scale. Relatively low deer densities have uncertain impacts on disease transmission potential, therefore further antlerless harvest is generally unnecessary. In these cases, county regulations may prioritize population recovery strategies by reducing doe harvest despite the presence of CWD.

2. Assess Management Options

The Iowa DNR employs various harvest-based tools to manage deer populations. While all of these methods provide opportunity for increased antlerless deer harvest, their primary distinction is the spatial scale at which they are applied. Determining effective management options relies on considering a variety of factors, such as current population status, population trends, historic harvest patterns, and hunter engagement (i.e., antlerless harvest demand/tolerance).

County Antlerless Tags

Overview: The goal of county antlerless tags is to provide the appropriate level of doe harvest in a county that is not being achieved through general any-sex licenses. County antlerless tags are the primary deer population management tool of the Iowa DNR. Antlerless tag quotas are assigned per county based on population management objectives and re-evaluated annually. While these tags are widely used in counties with quotas, they provide less ability to spatially focus harvest compared to other management options.

Best practices: Increasing county antlerless tags is optimal when 1) the county deer population is determined to be above management objective and is stable/increasing, 2) CWD detections are widespread across county, and 3) current county antlerless quota is selling out consistently across years.

January Antlerless Season (Population Management)

Overview: The goal of implementing the Population Management January Antlerless Season is to allow additional opportunity for utilizing unsold county antlerless licenses. The Population Management January season allows additional antlerless harvest opportunities in select counties where additional doe harvest is deemed appropriate. The season is conditionally held only if the number of unsold county antlerless licenses exceeds 100 on the third Monday in December. This special season allows the opportunity for any method of take legal in previous deer seasons (archery, shotgun, handgun, muzzleloader), in addition to center-fire rifles.
Best practices: The January Antlerless Season is best suited for counties which 1) contain an antlerless quota that exceeds annual demand and 2) are determined to be above the population management objective.

CWD Deer Management Zones (DMZ)

Overview: The goal of implementing CWD DMZs is to increase doe harvest locally to lower or maintain deer density, potentially decreasing disease transmission over time. These zones can provide additional antlerless-only harvest opportunities within geographic regions that are typically smaller than the county in which they occur and span an established disease management area (i.e., CWD endemic zone determined via disease surveillance). DMZ antlerless licenses are similar to county antlerless licenses in that they must be designated for a specific season (e.g., archery, early muzzleloader, etc.); however, unlike county licenses, DMZ licenses can be designated for any season irrespective of other deer hunting licenses bought.

Best practices: DMZs are most successful in the following situations: 1) focused harvest is desired within a region smaller than a county, 2) focused harvest is desired within a region that crosses county boundaries, and/or 3) the DMZ occurs within a county that consistently sells out the county antlerless quota. DMZs may also be advantageous when increased surveillance through sampling may require additional deer harvest and/or additional harvest opportunities are encouraged in the area due to land ownership and access. Zone boundaries are best defined by easily identifiable borders such as roads, rivers, and city/county/state lines.

CWD Incentive Zone

Overview: The goal of implementing the incentive framework is to reduce disease prevalence in areas with a high number of disease detections through voluntary, localized harvest on private property. A special January season occurs within each Incentive Zone during which individuals can earn the opportunity to purchase an additional general (any-sex) license for the hunting season of their choice in the following year. To earn this incentive, hunters must register to hunt within the designated area during the special season and harvest at least three female deer (does). Hunters must also allow the DNR to sample each of these does in order to qualify for the incentive license. While the primary objective is to remove CWD-positive deer from the landscape within relatively high-prevalence areas, these special hunts may also reduce local deer densities. Therefore, these hunts are conditional on local population and harvest data. Since 2021, effectiveness across locations has been variable (Tables 2-6).

Protocol: The following conditions ensure the effective and responsible implementation of the CWD Incentive Zone framework:

I. **Annual Population Monitoring**: A population survey, such as a supplementary spring spotlight route, will be established and conducted annually within each Incentive Zone. This survey will provide critical data to monitor changes in deer density over time, allowing the DNR to assess and evaluate the impact of the incentive framework on local deer densities and adjust management strategies as needed.
II. **Harvest Goal**: A specific will be established within each Incentive Zone to represent the desired deer harvest level that balances disease mitigation and future quality hunting opportunity. The goal will be informed, in part, by the annual population monitoring outlined above. Additional information considered includes county-level population trends and feedback from local hunters, landowners, and staff.
III. **Incentive Tag Quota**: A specific quota of tags will be established for each Incentive Zone annually. This quota will be based on the determined level of antlerless harvest necessary to achieve, but not exceed, a reduction in density in accordance with the Harvest Goal. This condition ensures a measured level of harvest occurs within each Incentive Zone.

Best practices: The success of these special hunts relies on dedicated staff resources; therefore, a limited number of hunts will be feasible across the state in any given year. CWD Incentive Zones will be determined based on the following factors: 1) apparent prevalence, 2) local deer population density, 3) local staff resources and landowner relationships, and 4) success of past incentive hunts (i.e., number of CWD-positive deer removed). Communicating the prescriptive and often temporary nature of these special hunts to participating landowners and hunters should always be emphasized.

3. Finalize Proposals

Ultimately, a final meeting will be held to confirm regulatory proposals (e.g., changes to county antlerless quotas, updated DMZs, etc.) that includes the Deer Program, CWD management team, Wildlife Bureau leadership, and relevant local staff. The resulting list of regulatory proposals will be introduced to the DNR Natural Resources

Commission (NRC), which is followed by a public comment period lasting approximately one month. Following this public comment period, the NRC will vote for final approval of regulatory proposals.

Past Strategies

Scientific Collection Permits

In 2015, 2017, and 2018, the Iowa DNR utilized scientific collection permits to increase deer harvest within established CWD-endemic regions of northeastern Iowa (Allamakee and Clayton county). Additional harvest within these regions served a dual purpose: balancing local deer densities and providing additional samples for CWD surveillance. These permits were provided to licensed resident hunters and provided additional harvest opportunities outside of the regular hunting seasons (Feb - March). Ultimately, this strategy was discontinued due to lack of hunter interest, underachievement of harvest and sampling goals, and potential for public controversy.

CWD Check Stations

Check stations were previously established to assist with surveillance goals, but eventually discontinued due to lack of efficacy compared to current outreach-based surveillance strategies. While DNR-managed check stations are not currently utilized, special programs, such as urban hunts, sometimes involve in-person registry requirements for harvested deer, which can offer opportunities to bolster CWD sampling in those areas.

CWD Carcass Dumpsters

In the early years of Iowa's CWD history, dumpsters were maintained by the DNR in endemic regions to mitigate the potential environmental transmission of CWD through discarded carcasses of harvested deer onto the landscape. This effort was discontinued as the geographic spread of CWD within the state created logistic- and resource-related issues. However, the Iowa DNR still encourages partnering organizations, such as County Conservation Boards, to consider maintaining carcass dumpsters if possible.

Future Considerations

The continued detection of CWD in new areas of Iowa, expanding distribution in both Iowa and adjacent states, as well as increasing prevalence rates may require re-evaluating current harvest management strategies. In the future, additional changes to hunting regulations may be needed in areas with high prevalence rates and/or wide spatial distributions. However, any management tools' success will rely on support from the public through outreach, education, and transparency as discussed in future sections of this document. Above all else, the Iowa DNR maintains its commitment to managing a balanced, quality deer population and relying on voluntary hunter harvest for population management.

RESEARCH EFFORTS

Overview

Effective wildlife management requires a science-based and adaptive approach, particularly in response to emerging challenges like CWD. The Iowa DNR has conducted and collaborated on multiple research projects and initiatives aimed at enhancing the monitoring and management of CWD across the state and beyond. Much of the research conducted by the Iowa DNR to date has been funded primarily by outside sources (e.g., USDA APHIS CWD Cooperative Agreements) with support from Iowa DNR staff.

Past Research

An innovative approach to evaluating effects of population management for CWD

Partners: Paul Lukacs and Guen Grosklos, University of Montana
Dan Walsh, U.S. Geological Survey

Camera trapping has gained popularity in recent years as a cost-effective, non-invasive method for estimating wildlife population densities. With a growing number of camera trap density estimators available, selecting the appropriate model requires proper evaluation of the data and their connection to the processes described by underlying equations. Moreover, the ecological processes that define densities must be representative of the population-level behavior of the study species. We developed a novel density estimator, the total density and staying time (TDST) model, which uses theory derived from the ecological diffusion equation (EDE) to define densities at the landscape level. The EDE is a

population-level process model that describes the aggregate behavior of random walk processes and has been used to analyze movement trajectories and population distributions for multiple wildlife species. We compared this model to four camera trap density estimators; the random encounter and staying time (REST) model, the time to event (TTE) model, the Poisson regression (PR) model, and the space to event (STE) model. We used agent-based simulations describing random walk patterns of individuals moving at speeds defined by three habitat types; slow, medium, and fast. To test the robustness of each model, we varied the number of cameras on the simulated area, camera survey design, and ran models with and without covariates.

Non-covariate models overestimated densities when cameras were placed in mostly slow habitat types and underestimated densities when cameras were placed in mostly fast habitat types. With covariates, all but the TTE model produced accurate density estimates even for non-random sample designs. Models required at least 50 cameras (covering 0.25% of the study area) for accurate density estimation. Compared to the other models, estimates from the TDST model were similar to the PR model across all simulations and consistently outperformed the REST, TTE, and STE models in both accuracy and precision. The underlying theory used to define the TDST model is unique to the currently available camera trap methods and provides a foundation for future research that integrates movement behavior with camera trap density estimators.

Evaluating diagnostic efficacy of pooled tissue sampling for CWD
Partners: Monica Hepker, Jianqiang Zhang, Anumantha Kanthasamy, Iowa State University
Wenquan Zou, Case Western Reserve University

From Hepker et al. (2024; see below):
Disease monitoring informs the opportunities for intervention by natural resource agencies tasked with managing chronic wasting disease (CWD) in wild cervids. However, allocating funds toward testing can reduce those available for education, outreach, and disease reduction. Implementation of more efficient testing strategies can help meet both an expanding need by resource managers and a burgeoning demand from the hunting public in North America. Here, we evaluated the efficacy of pooled testing using the enzyme-linked immunosorbent assay (ELISA), the current screening test used by veterinary diagnostic laboratories in the United States, and real-time quaking-induced conversion (RT-QuIC), an amplification assay that is being evaluated by the U.S. Department of Agriculture but is not yet approved or commercially available. The samples used in this study consisted of medial retropharyngeal lymph nodes (RPLNs) routinely collected by the Iowa Department of Natural Resources during the 2019-2020 surveillance season. The test pools contained tissue from one positive deer diluted in tissue from an increasing number of undetected deer, with each individual contributing an equal tissue volume. ELISA remained positive with pooling thresholds of 1:1, 1:2, 1:4, and 1:9 at a standard volume of tissue homogenate, whereas RT-QuIC remained positive with pooling thresholds of 1:1, 1:2, 1:4, 1:9, 1:19, and 1:49 at a 0.02% tissue dilution. Our results suggest that pooled testing can reduce diagnostic costs multi-fold, and RT-QuIC can be a viable screening test compatible with current field collection standards.

Ongoing Research

Hunter and landowner motivations for participating in special incentive management hunts
Partners: Adam Janke, Heather Bryant, Emma Kring, Catherine Cummings, Iowa State University

Increased harvest locally is critical to effectively slow the spread of CWD in core disease areas. However, wildlife agencies lack a model for establishing hunter-landowner partnerships to facilitate hunter access to land and opportunity to remove diseased animals. Building these partnerships requires a better understanding of landowner and hunter motivations for participating in special, incentive management hunts within core disease areas.

In 2022-2024, the Iowa DNR implemented special incentive management hunts in partnership with Iowa State University in three core disease areas in Iowa: Harpers Ferry Disease Management Zone, Elkader Disease Management Zone, and Corydon Disease Management Zone. Participating landowners and hunters were asked to complete a survey after the special incentive hunts to better understand their motivations for participating. Survey results from 2022 and 2023 indicated that a majority of landowners (2022 = 74%, 2023 = 77%) allowed additional harvest on their property to help slow the spread of CWD. Landowners were also interested in harvesting more deer to reduce deer damage to agricultural crops (2022 = 58%, 2023 = 52%) and providing additional recreational opportunities to friends, family, and

neighbors (2022 = 58%, 2023 = 56%). Hunters participated in special incentive management hunts primarily to obtain the bonus any-sex deer license (2022 = 72%, 2023 = 75%) and to help slow the spread of CWD in the area where they hunt (2022 = 65%, 2023 = 71%). Hunters were also interested in spending more time in the field hunting deer (2022 = 76%, 2023 = 55%).

Evaluating the use of scrape sampling for detecting local presence of CWD
Partners: Miranda Huang and Steve Demarais, Mississippi State University
Stuart Lichtenberg, University of Minnesota
Emma Kring and Catherine Cummings, Iowa State University

CWD testing currently demands significant staff time and stakeholder involvement, which can lead to uneven sampling across regions and inconsistent results. Environmental sampling - particularly at deer scrapes - offers a promising alternative by allowing for passive, widespread testing in areas with limited public engagement. Since scrapes are frequently visited by multiple deer and can become contaminated with CWD prions, they represent valuable surveillance points. This approach can improve sampling coverage and give wildlife agencies greater control over data collection. However, further research is needed to refine sampling techniques and testing protocols to ensure reliable detection and interpretation of results.

The Iowa DNR, in partnership with staff from Iowa State University, sampled a total of 150 scrapes on public and private lands (8 sites total) in northeastern and south-central Iowa CWD-endemic areas during the 2023-2024 breeding season. A total of 12 scrapes (8%) tested positive for CWD. Across the 8 sites, percent positive ranged from 0% to 32%. Sample collection will continue during the 2024-2025 breeding season.

Surveillance Optimization Project for CWD (SOP4CWD)
Partners: Krysten Schuler and Brenda Hanley, Cornell University
Boone and Crockett Quantitative Wildlife Center at Michigan State University
Various state and federal agency biologists

Disease surveillance, including efforts to detect new introductions quickly and measure changes in disease prevalence in areas where it exists, is an essential component of the disease response plans enacted by wildlife agencies across North America. SOP4CWD addresses questions about where to focus efforts, how many samples are required to determine if an area is free from disease, and determine if prevalence is increasing or decreasing in an area by applying analytical techniques such as risk weighting, Bayesian modeling, geospatial analysis, and machine learning algorithms.

A product of the SOP4CWD collaboration is the CWD Data Warehouse, an online platform for CWD surveillance planning and data management available at no cost to state (US and Mexico), tribal, and provincial wildlife agencies in North America. The CWD Data Warehouse supports the development of efficient and effective surveillance plans based on the best available science and mathematical methods. The Warehouse can also serve as the foundation of a data management system for agencies that need a reliable and efficient solution for their surveillance data management and processing.

For more information, visit: https://cwhl.vet.cornell.edu/project/sop4cwd

National Interdisciplinary Chronic Wasting Disease Research Consortium
Research across multiple disciplines is needed to fully address the complexities of CWD and acquire the knowledge needed to limit or eliminate its spread. Research programs are emerging and maturing at multiple universities and government agencies. These are developing in parallel with little coordination. For example, within institutions of higher education located in the Midwest alone, three large studies have been initiated within the last two years to investigate the role of movement behavior in shaping epidemiological models of CWD. The National Interdisciplinary CWD Research Consortium is a multi-state consortium designed to improve information exchange among universities and researchers with common goals, but different backgrounds and knowledge bases. Increased collaboration would improve research quality and avoid duplication of work at a critical time when effective solutions are needed quickly.

The Iowa DNR currently participates in the consortium and collaborates on various research efforts that are developed by the consortium, including but not limited to evaluating CWD management strategies across state boundaries and using social sciences to inform CWD management.

For more information, visit: https://www.cwd-research.com/

Beta testing pooled sampling thresholds against traditional CWD testing
Partners: Hao Tong, Monica Hepker, Sydney Long, Julia Garrow, Jianqiang Zhang, Iowa State University

This project builds on the completed project above that evaluated the diagnostic efficacy of pooled tissue sampling for CWD. The above project identified that a single positive deer could be reliably detected in pools of up to 10 (using ELISA) or 50 (using the more sensitive RT-QuIC assay) under controlled conditions. This study will now test those thresholds-alongside more conservative ones (1:4 and 1:24)-under real-world conditions using a subset of 1,250 deer samples. Results from individual tests will guide the creation of pooled samples, and both technician time and material costs will be tracked to assess efficiency. The ultimate goal is to determine the most reliable and cost-effective pooling strategy to shift resources from disease surveillance to active disease management.

A total of 25 replicate pools of lymph nodes were tested of varying optical densities (Negative, 0-1, 1-2, 2-3, 3-3.99) using both ELISA and RT-QuIC and were nested within different sizes of pools (5, 10, 25, and 50 lymph nodes). Overall, RT-QuIC was similarly sensitive with pool sizes of 25 and 50 lymph nodes to ELISA with pool sizes of 5 and 10 lymph nodes. RT-QuIC sensitivity ranged from 68.4% to 94.7% for pools of 25 lymph nodes and 78.9% to 84.2% for pools of 50 lymph nodes. ELISA sensitivity ranged from 84.2% to 89.5% for pools of 5 lymph nodes and 84.2% to 94.7% for pools with 10 lymph nodes. Finally, results indicated 100% specificity across both assays and all thresholds.

Relevant scientific publications from Iowa DNR and partner research

Ahmed, MS, BJ Hanley, CI Mitchell, RC Abbott, NA Hollingshead, JG Booth, J Guinness, CS Jennelle, FH Hodel, C Gonzalez-Crespo, CR Middaugh, JR Ballard, B Clemons, CH Killmaster, TM Harms, JN Caudell, KM Benavidez Westrich, E McCallen, C Casey, LM O'Brien, JK Trudeau, C Stewart, M Carstensen, WT McKinley, KP Hynes, AE Stevens, LA Miller, M Cook, RT Myers, J Shaw, MJ Tonkovich, JD Kelly, DM Grove, DJ Storm, and KL Schuler. 2024. Predicting chronic wasting disease in white-tailed deer at the county scale using machine learning. Scientific Reports 14:14373.

Bartz, JC, R Benavente, B Caughey, S Christensen, A Herbst, EA Hoover, CK Mathiason, D McKenzie, R Morales, MD Schwabenlander, DP Walsh, and the NC1209: North American Interdisciplinary Chronic Wasting Disease Research Consortium Members. 2024. Chronic Wasting Disease: State of the Science. Pathogens 13:138

Hepker, M, J Zhang, V Anantharam, AG Kanthasamy, J Yuan, W Zou, and RM Ruden. 2024. Evaluating the diagnostic efficacy of using pooled samples for Chronic Wasting Disease Testing and Surveillance. Pathogens 13:1133

EDUCATION AND OUTREACH

Overview

The Iowa DNR is committed to developing innovative educational outreach programs to enhance the public's awareness of CWD and foster collaboration. With an increasing number of counties detecting CWD, efforts focus on educating hunters, landowners, and the public on best practices for hunting and processing, while actively involving them in disease management. Key initiatives include the Chronic Wasting Disease Ambassadors Program, sampling demonstrations, seminars, and hunter education.

Chronic Wasting Disease Outreach Specialist

Chronic Wasting Disease Outreach Specialist positions were first created in 2021 to serve as a joint role with Iowa State University Extension and Outreach and the Iowa DNR. These positions seek to engage the public by providing education and outreach regarding CWD mitigation and management to relevant stakeholder groups across the state. CWD Outreach Specialists also serve as a resource for local communities across Iowa, particularly those within CWD-positive regions of the state. They have also been integral in administering CWD Incentive Hunts, from recruiting landowners and hunters to being the local point of contact during the special hunting season.

Outreach Events

CWD Ambassadors Program

Chronic Wasting Disease Ambassadors is a collaborative education program between the Iowa DNR and Iowa State University Extension and Outreach that seeks to help Iowans address the challenge of Chronic Wasting Disease. The goal of the program is to develop a small, connected, and well-educated network of local leaders to effectively communicate about the management and mitigation of CWD. Graduates of the three-week training program become "ambassadors" for the science-based management of CWD. Ambassadors are knowledgeable in the management, prevention, and testing for the disease and equipped with communication skills and resources to help educate others within their communities. Participants have included hunters and non-hunters, community members, and anyone interested in white-tailed deer conservation and management. Certain programs are offered to local county conservation staff, as well as other local conservation - or animal health-related professionals.

Learning is achieved through in-person instructions, demonstration, and networking and short online lessons between class sessions that allow ambassadors to learn at their own pace. The program covers everything from the basics of CWD ecology to the art of science communication, comprising about eight hours of learning and networking with ISU and DNR educators and other concerned community members. For more information about CWD Ambassadors or to explore opportunities to host a course in your community, please visit: https://naturalresources.extension.iastate.edu/programs/chronic-wasting-disease-ambassadors.

Seminars

The Chronic Wasting Disease Outreach Specialist conducts seminars across Iowa, educating hunters and landowners about deer diseases including Chronic Wasting Disease and Hemorrhagic Diseases. These presentations focus on disease epidemiology, management strategies, and practical steps to mitigate risks, empowering stakeholders to contribute to the health of Iowa's deer populations. The target audience includes hunters, landowners, wildlife enthusiasts, and conservation groups. Seminars have been conducted in collaboration with County Conservation staff, ISU County Extension offices, sportsmen clubs, local colleges and universities, and other partners.

Sampling Demonstration

CWD sampling demonstrations provide participants the chance to learn how to collect and submit tissue samples (i.e., retropharyngeal lymph nodes) for CWD testing. Depending on the audience, this demonstration can use a single deer head for observation or multiple deer heads for a hands-on experience. Participants learn the proper techniques for retrieving the retropharyngeal lymph nodes, packing the samples for testing, and proper tool cleaning protocols. Designed for hunters and wildlife professionals, the sampling demonstration emphasizes the critical role of surveillance in managing CWD and equips participants with the practical skills to support monitoring efforts.

Tabling

The Chronic Wasting Disease Outreach Specialist sets up an informational booth to provide resources and answer community questions about CWD. At the information booth there are educational materials, including pamphlets, handouts, and a 3D model of a deer head to demonstrate retropharyngeal lymph nodes removal for sampling. These events are designed to engage hunters, landowners, and the public in one-on-one discussions to raise awareness and support efforts in managing and mitigating CWD. Tabling events have been featured at county fairs, archery events, hunting expos, and other community gatherings.

Hunter Education

In 2024, the Chronic Wasting Disease Outreach Specialist piloted short talks as a part of in-person hunter education programs, with a focus on youth education. These presentations introduced young hunters to CWD, its effects on deer populations, and the importance of testing and management efforts. Through age-appropriate content, participants learned about the basics of CWD, how to recognize clinical signs of the disease, and steps for submitting samples for testing. As a successful pilot initiative, the Iowa DNR aims to expand this programming in the future to reach more young hunters across the state, fostering early awareness and responsible hunting practices that support wildlife health and conservation.

PARTNERSHIPS

Overview

Strategic partnerships are important for informing a network of peer agencies, alleviating workload concerns, and including as many of the impacted stakeholders as possible in CWD management and outreach efforts. Current and potential partnerships are diverse, as CWD has potential impacts that extended beyond the hunting community. The Iowa DNR will continue to partner with outdoor recreation groups, conservation organizations, and various other stakeholders to improve public understanding and support for CWD-related efforts in Iowa. Partnerships between field staff and local operations (law enforcement, DOT staff, etc.) can be particularly productive from a disease surveillance standpoint. Whether it is in an animal care facility that uses venison from roadkill or a local hunt club, all of the following partnerships can provide productive avenues of bolstering public trust and support.

Current Partnerships

Hunters

Iowa's deer hunters remain the highest priority partner for CWD-related engagement. The vast majority of Iowa's deer management and disease surveillance rests on the shoulders of deer hunters, who also make up the single most affected user group from future impacts of CWD. Maintaining a high level of public trust and support is critical to the success of any CWD-related efforts. Therefore, Iowa's deer hunters are frequently engaged through various surveys, public meetings, and opportunities for one-on-one conversation. This process allows the DNR to understand the tolerances, attitudes, and concerns of Iowa's deer hunters with regard to CWD-related efforts.

Farmers

Building trust and relationships with Iowa's farmers and landowners remains another top priority for the Iowa DNR. The vast majority of Iowa's landscape is privately owned and farmed, which means that landowners primarily control access for hunting opportunities, as well as manage habitat and/or harvest of game species for most of the Iowa landscape. Of all wild game species in Iowa, this has particularly strong implications for white-tailed deer, specifically related to property access and population management.

Farmers experiencing significant crop damage from deer can work with the DNR depredation staff to increase opportunity for doe harvest and thereby achieve healthy, balanced deer populations at the property level. While the Depredation Program is primarily focused on alleviating economic hardship caused by local deer populations, this program can also mitigate CWD transmission through reducing overabundant deer levels at the property scale. Additionally, participating landowners provide a strategic avenue to acquire additional samples for surveillance efforts.

County Conservation Boards (CCBs)

The County Conservation Board (CCB) system in Iowa is a powerful network that connects Iowans with the outdoors in every county of the state. This network of conservation professionals is a public asset and is supportive of a range of DNR priorities. From facilitating carcass and sample drop points to hosting public meetings, the CCBs of Iowa remain instrumental in outreach, field work, and public relations. Furthermore, CCBs have the autonomy to implement CWD-related efforts (e.g., mandatory sampling during special hunts) within their counties that can contribute to the broader disease response effort.

The Iowa DNR, in partnership with Iowa State University Extension and Outreach, has developed a template county-specific CWD resource guide. The purposes of these guides are to provide CCBs with local information and guidance on CWD Best Management Practices to empower them to contribute to CWD mitigation and communication locally. The resource guide includes sections that describe the history of CWD in Iowa and in the respective county, CWD surveillance and monitoring goals within the county, and CWD Best Management Practices. The guide is flexible and therefore can adapt to the changing landscape of CWD in Iowa and knowledge of CWD Best Management Practices can be tailored to specific counties based on capacity.

Iowa Department of Transportation (DOT)

Roadkill deer are a valuable source of samples for CWD surveillance given that they can be more evenly distributed across the landscape compared to hunter-harvested samples. Prior to 2024, 10% of samples collected each year came from roadkill deer-during the 2024 season, local staff worked closely with IDOT locations to increase the number of

roadkill deer sampled to make up 20% of the sample stream. DNR staff are encouraged to reach out to local IDOT locations to make partnerships. IDOT staff have previously provided mile markers and flagged locations of tall grass burial deer off roadways for DNR to sample. The IDOT manages roadkill deer on major roadways statewide and therefore represent an ideal partner for helping field staff locate additional samples at all times of year.

Local Law Enforcement

Local law enforcement, such as sheriff and police departments, provide an additional partnership opportunity to increase availability of roadkill samples due to their local presence and duties related to deer-vehicle collisions.

Iowa State University Extension and Outreach

Chronic Wasting Disease Outreach Specialist positions were first created in 2021 through funding provided by awarded grants from the USDA Animal and Plant Health Inspection Service to serve as a joint role with ISU Extension and Outreach and the Iowa DNR. These positions seek to engage the public by providing education and outreach regarding CWD mitigation and management to relevant stakeholder groups across the state. CWD Outreach Specialists have also been integral in administering CWD Incentive Hunts, from recruiting landowners and hunters to being the local point of contact during the special hunting season. The Iowa DNR partners with staff from Iowa State University Extension and Outreach to administer the Chronic Wasting Disease Ambassadors program across the state of Iowa (see Education and Outreach section).

Colleges and Universities

The Iowa DNR has partnered with colleges and universities locally to bring undergraduate students into the field during peak CWD sampling efforts. Students work one-on-one with DNR staff where they learn how to pull CWD samples and interact with Iowa's deer hunters. These institutions also represent a potential education and outreach venue for both students and the public, as well as potential research partners (see Research Efforts section).

Venison Processors (Lockers)

Many hunters utilize meat lockers to process their deer. In a recent survey, 54.7% of Iowans indicated that they utilize a locker for deer processing. The Iowa Meat Processors Association has 39 registered venison processing businesses, many of which continue to accept CWD-sampled deer. Doing so supports a robust statewide surveillance program and demonstrates important partnership among key stakeholders.

Taxidermists

Taxidermists are an important partner for the Iowa DNR in providing access to valuable samples from older, mature bucks. Additionally, mature bucks that are going to be shoulder mounted are not able to be sampled by DNR field staff, since sampling requires a cut through the hide, and instead require the assistance of a taxidermist. In 2024, approximately 5% of the samples tested for the state's CWD surveillance program came from partnering taxidermists. Taxidermists can be provided ear tags that hunters fill out including their name, phone number, harvest location, and registration number. Taxidermists store deer heads after they are caped and skull capped and then can contact local DNR staff to coordinate pick up. DNR staff dispose of the deer heads after samples are pulled.

Future Partners

The Iowa DNR is always looking to expand partners in the communication and management of CWD. Please reach out to staff to see how your company can partner with the Iowa DNR.

FINAL SUMMARY

This comprehensive plan outlines the Iowa DNR's strategic approach to managing CWD over the next five years, recognizing the disease's persistent threat to Iowa's white-tailed deer population and various stakeholders. Recognizing that CWD eradication is currently unattainable, the plan prioritizes mitigating CWD's spread and managing its impacts through enhanced surveillance, targeted management strategies, and robust public education and outreach. Key to this approach is a commitment to adaptive management, acknowledging the evolving nature of CWD and the need for science-driven responses while maintaining public trust and support. By leveraging a weighted surveillance protocol, engaging in proactive stakeholder collaboration, and utilizing validated diagnostic testing, the DNR strives to efficiently monitor and document CWD's progression.

Ultimately, the Iowa DNR's efforts are focused on balancing the long-term health and sustainability of Iowa's deer population while safeguarding the state's rich hunting tradition and quality deer herd. Through a combination of thorough data collection, strategic management interventions, and consistent public engagement, this plan seeks to minimize the adverse effects of CWD. The DNR is dedicated to responsible stewardship, balancing the challenges of disease management with the conservation of Iowa's natural resources for future generations.

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TABLES

Table 1. CWD Surveillance Statistics in Iowa.

Year	Deer Sampled Per County			Total Samples	Counties Sampled
	Median	Minimum	Maximum		
2002	17	2	487	3,130	99
2003	17	2	506	3,740	99
2004	15	3	519	4,073	99
2005	15	1	535	3,789	99
2006	15	4	472	3,589	99
2007	15	3	528	3,685	99
2008	14	1	514	3,543	99
2009	15	1	384	2,809	93
2010	15	1	429	3,704	98
2011	16	1	460	3,895	98
2012	17	3	360	3,819	99
2013	17	1	388	4,031	99
2014	17	1	541	4,365	99
2015	16	3	668	4,549	98
2016	15	2	782	4,710	99
2017	17	4	914	6,362	99
2018	19	9	830	7,632	99
2019	19	11	658	7,362	99
2020	17	10	366	5,783	99
2021	26	10	433	5,275	99
2022	24	11	476	5,053	99
2023	26	10	408	5,693	99
2024	27	10	385	5,470	99

Table 2. CWD Incentive Hunt Statistics-Corydon, IA (Wayne County).

	2021	2022	2023	2024	2025
Participating landowners	31	31	28	34	9
Huntable acres (private)	6,100	5,500	7,000	7,300	3,350
Participating hunters	35	36	43	41	13
Earned any-sex tags	31	29	32	30	10
Total Harvested	106	100	109	93	33
Does	102	98	104	91	30
Shed Bucks	1	1	1	0	1
Button or Spike Bucks	3	1	4	2	2
CWD Positives	3	13	20	15	10
Apparent Prevalence	3.4%	13.0%	18.7%	16.1%	30.3%

Table 3. CWD Incentive Hunt Statistics-Harpers Ferry, IA (Allamakee County).

	2022	2023	2024	2025
Participating landowners	33	39	25	27
Huntable acres (private)	8,106	9,016	13,181	8,134
Participating hunters	34	60	39	34
Earned any-sex tags	18	22	25	18
Total Harvested	68	96	85	67
Does	61	79	82	62
Shed Bucks	5	8	0	2
Button or Spike Bucks	2	9	3	3
CWD Positives	0	6	3	10
Apparent Prevalence	--	6.3%	3.5%	14.9%

Table 4. CWD Incentive Hunt Statistics-Elkader, IA (Clayton County).

	2022	2023	2024
Participating landowners	19	40	15
Huntable acres (private)	4,865	11,212	5,550
Participating hunters	30	63	27
Earned any-sex tags	10	14	12
Total Harvested	40	66	50
Does	34	53	42
Shed Bucks	2	4	2
Button or Spike Bucks	4	9	6
CWD Positives	2	3	2
Apparent Prevalence	5.0%	4.5%	4.0%

Table 5. CWD Incentive Hunt Statistics-Cascade, IA (Dubuque County)

	2024	2025
Participating landowners	22	10
Huntable acres (private)	3,400	1,900
Participating hunters	37	33
Earned any-sex tags	6	3
Total Harvested	29	36
Does	23	24
Shed Bucks	3	4
Button or Spike Bucks	3	8
CWD Positives	7	2
Apparent Prevalence	24.1%	5.6%

APPENDIX

Guidelines for Captive Cervid Disease Eradication Plan

Objective

This document discusses important considerations when developing a disease eradication plan following the detection of Chronic Wasting Disease (CWD) within a hunting preserve. This plan must be established and signed as a memorandum of agreement between the preserve operator and the Iowa DNR within 60 days of first detection, as per 571-104.10(481A).

Location of Affected Captive Cervids

- Preserves with CWD-positive captive cervids located outside of CWD endemic areas of the state (e.g. counties without any detections or ≤1 detection within the last five years) should be depopulated to prevent transmission to wild deer.
- Preserves with CWD-positive captive cervids located within CWD endemic areas should be encouraged to depopulate. After the five-year quarantine, cervids can be reintroduced to the facility, however the risk of environmental transmission will remain.

Surveillance Strategy

- For preserves that choose to continue to operate and/or use client harvest to achieve the requirements of the eradication plan:
  - Year 1: Harvest at least 20% of the remaining adult cervids to better understand the apparent prevalence of CWD within the affected herd.
  - Years 2-5:
    - If no additional detections, harvest at least 20% of the remaining herd in the following year. Both yearlings and adults will count toward this minimum. Fawns harvested or found dead shall still be tested as per 571-104.2(481A).
    - If <5% test positive, harvest at least 30% of the remaining herd in the following year.
    - If >5% test positive, harvest at least 50% of the remaining herd in the following year.

Carcass Management

- Carcasses from harvested cervids should be held on site until disease status is known. Properly cleaned skull plates from which all brain tissue has been removed and hides may be removed prior to, and without regard for, the test result.
  - Carcasses from cervids that test “Not Detected” for CWD by ELISA may leave the premises for routine processing and disposition. Carcasses that remain on-site should be disposed of consistent with the guidelines outlined in the next section or via landfill, when available.
  - Carcasses from cervids that test CWD-positive shall be buried on site as specified in the next section. Additional detections will extend the timeframe of quarantine to five years beyond the date of most recent detection. The disease eradication plan will be renewed every five years.

Carcass Disposal

- Carcasses should be buried at a maximum loading rate of 20 cervids per acre.
- Carcasses should be buried in soils listed in tables contained in the county soil survey and soil interpretation records (published by the Natural Resources Conservation Service) as being moderately well drained, well drained, somewhat excessively well drained, or excessively drained.
- The lowest elevation of the burial pit should be 6 feet below the surface.
- Carcasses should be immediately covered with a minimum of 6 inches of soil and finally covered with at least 30 inches of soil.

Best Management Practices for White-Tailed Deer Hunting Preserves

Objective

This document provides the best management practices (BMPs) for operating a white-tailed deer hunting preserve within the state of Iowa. Chronic Wasting Disease (CWD) is a grave concern for both captive and wild deer. Iowa has several endemic CWD areas. Protecting the health and well-being of a captive herd is in the long-term financial interest of the preserve owner and operator. State law establishes minimum hunting preserve operational standards, including for fence construction and maintenance. But these laws were not designed to specifically prevent or limit spread of transmissible diseases like CWD. More precise CWD prevention strategies are, therefore, strongly recommended. The BMPs reflect scientific consensus on such methods. If implemented and diligently followed, these BMPs will reduce the likelihood of introduction and spread of CWD within the preserve.

Please note, establishing a new hunting preserve within counties that have two or more positive detections in the wild is not advised. This is because deer that may be included for propagation within the fence boundary will be of uncertain disease status. Additionally, the geographical footprint of CWD within the county and proportion of the population infected is likely to expand.

Best Management Practices

1. Maintain a double-fenced deer enclosure consisting of an exterior property fence and interior perimeter fence, each at least 10 feet high and spaced at least 10 feet apart, with the outer fence at least five feet away from the property boundary. Maintain both fences to eliminate contact points, especially nose-to-nose contact, between captive deer and those in the wild. This is necessary because CWD is primarily transmitted through the exchanging of body fluids like saliva. Though a single perimeter fence at this height should prevent the ingress/egress of individuals, it will not prevent CWD transmission across the fence line.
2. Propagate deer from those individuals already contained within the fence boundary. If additional deer are imported into the preserve, screen individuals for CWD using an antemortem test requiring rectoanal mucosa-associated lymphoid tissue (RAMALT) or tonsillar biopsy. Ensure deer test “Not Detected” prior to movement onto the property.
3. Ensure all cervids or cervid products (e.g., semen for artificial insemination) originate from a CWD-free certified herd, meaning it has been enrolled in and compliant with the USDA’s CWD Herd Certification Program or comparable state herd certification program for at least 5 years.
4. Maintain all official animal IDs, including ear tags, tattoos, or other identifying point-of-origin markers, and record any official animal IDs when samples are submitted for CWD testing. This will aid trace-out should a source herd breakout with CWD.
    a. Please note: It is **unlawful** to remove or destroy any forms of official identification once an animal has been subjected to disease testing. Iowa Code § 163.25.
5. Maintain Certificates of Veterinary Inspection, required for both intra- and interstate transport of deer, for at least five years. This will aid trace-out should a source herd break with CWD.
6. Contact your local Conservation Officer immediately should preserve deer get outside of the enclosure. All escaped captives must be returned to the fence within 24 hours or you should consent to having them dispatched. The likelihood of captive deer interacting with wild deer of unknown disease status will increase with time.
7. Should a deer test CWD-positive within the preserve, maintain the preserve’s perimeter fence(s) and keep all gates closed (absent immediate ingress or egress) for the duration of the 5-year quarantine. The quarantine is necessary because the CWD prion can remain infective for an indeterminate number of years on the landscape without a live animal host. Reintroduction of cervids into a CWD-positive area will likely result in a renewed outbreak.
    a. Remember: The property may be put to other beneficial uses during the quarantine, and other non-CWD susceptible species may be on-site. Only cervids are prohibited from entering or leaving the property during the 5-year term.