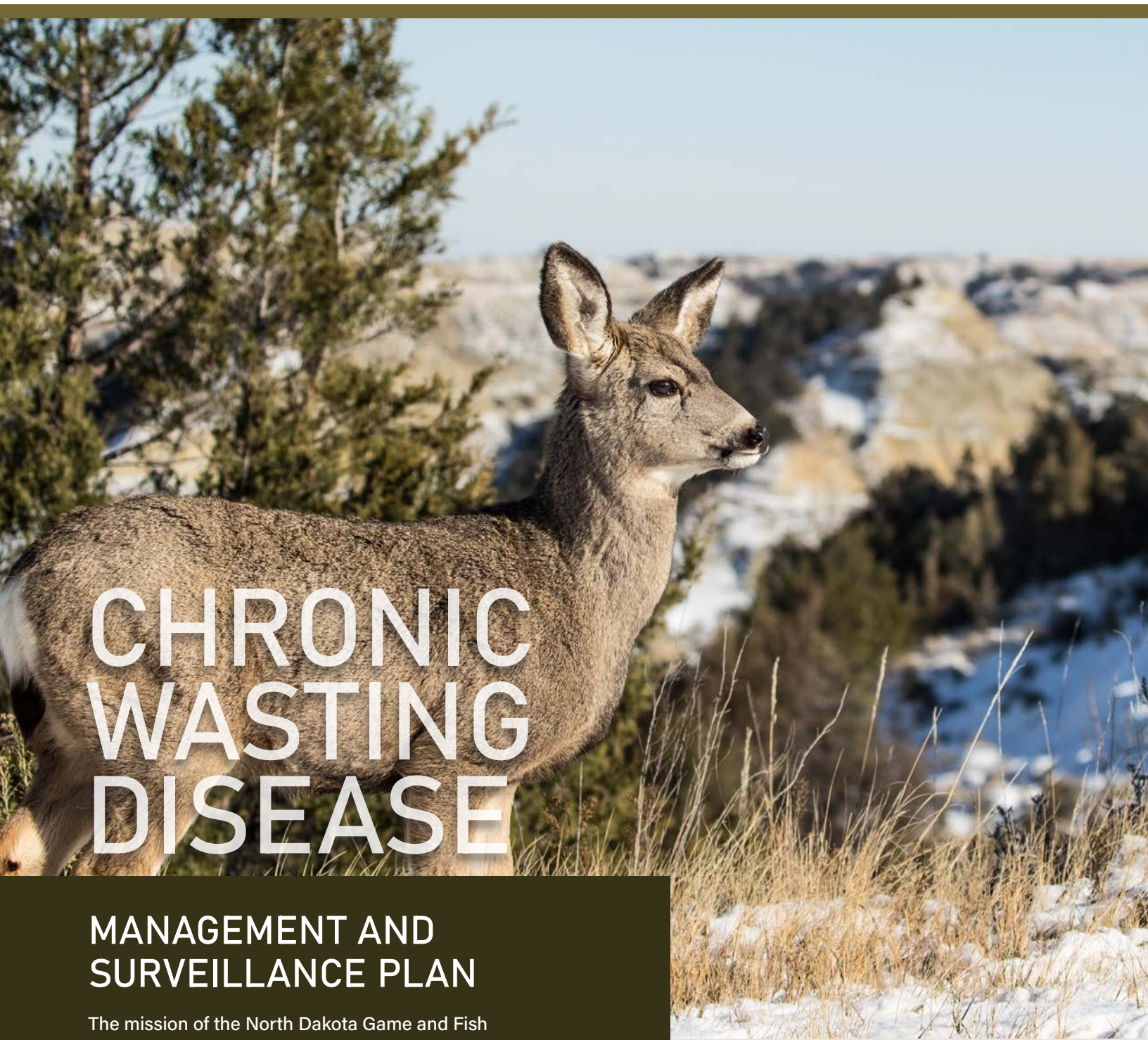


2023-2027



CHRONIC WASTING DISEASE

MANAGEMENT AND SURVEILLANCE PLAN

The mission of the North Dakota Game and Fish Department is to protect, conserve and enhance fish and wildlife populations and their habitat for sustained public consumptive and nonconsumptive use.



LETTER FROM THE DIRECTOR

The North Dakota Game and Fish Department's decisions and actions are informed by our responsibility to protect, conserve and enhance wildlife populations for current and future use. When a threat to wildlife populations appears, the Department is obligated to address that threat using science and expertise, even when that means making hard choices.

Chronic wasting disease is one such threat. Although it was first found in North Dakota over a decade ago, it was only in the last couple of years where it has been detected in other parts of the state. We have yet to feel the impacts of this disease on our big game populations, but experience from other states and provinces suggest there can be consequences if the disease is left unchecked.

Responding to this, a CWD task force was formed in 2021 that included Game and Fish staff from several divisions. The purpose of the task force was to review the science of CWD, evaluate the status of CWD management in North Dakota, and chart a best path forward while folding in lessons learned across North America over decades.

What follows is an outline for how the Department plans to manage CWD moving forward. The ultimate, clear-eyed objective of CWD management is to slow the spread of the disease. Everyone with an interest in our big game resources has a role to play and can help the Department achieve that objective. Given the deep-rooted passion for big game and big game hunting in North Dakota, I'm confident that we can rise to the challenge, continue to enjoy our big game populations long into the future, and pass on this rich tradition to the next generation.

Sincerely,
Jeb Williams, Director
North Dakota Game and Fish



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EXECUTIVE SUMMARY

Chronic wasting disease is a long-term threat to big game hunting in North Dakota. Herds with higher infection rates produce fewer mature animals and experience higher annual death loss, thereby reducing how many animals can be sustainably harvested. The disease was first identified in North Dakota in mule deer in 2009 and white-tailed deer in 2013. It has been detected in eight deer gun units as of September 1, 2022. As the primary agency charged with protecting the state's wildlife populations for sustained use, North Dakota Game and Fish takes the threat of CWD seriously. The Department will continue to use the best available evidence to minimize the impacts of this emerging disease.

Critical to managing CWD is a good understanding of where and how common the disease is within the state's herd. The previous surveillance strategy tested CWD-negative units every three years but rarely received enough samples to make statistically valid inferences. In contrast, CWD-positive units were tested annually. For the purpose of monitoring disease trends, this yielded more information than necessary since meaningful changes in CWD typically occur on a multi-year-long scale. Moving forward, the Department will test all units less frequently but more intensively. Focusing resources within a smaller area will generate more accurate, informative data.

The practice of baiting exposes more deer to higher levels of CWD compared to what occurs naturally. A restriction on this practice is aimed to reduce the overall risk of contact with contaminated landscapes or infected deer, thereby slowing how quickly the disease spreads. Baiting will not be legal in any deer hunting unit that falls within 25 miles of a CWD detection. The restriction may be lifted if CWD is not detected in a subsequent year following sufficient testing.

Chronic wasting disease can be introduced into new areas by the movement and improper disposal of infected carcasses. The brain and spinal cord of an infected animal contain an especially high concentration of CWD. Left on the landscape, this can serve as a source of infection for years. Previous carcass transportation restrictions were intended to prevent the movement of potentially contaminated carcass remains from units where the disease had been detected into areas of the state assumed to be CWD-free. However, as the footprint of affected areas continues to expand, the regulatory emphasis will shift from controlling movement on the front end, to influencing disposal. Successful hunters will be able to freely move intact carcasses within the state, but carcass waste (parts not consumed or preserved for taxidermy) must be disposed of via landfill.

In contrast to baiting and carcass movement, which can adversely contribute to CWD, the most useful tool in combating CWD in North Dakota is harvesting animals. By focusing hunting pressure in areas of the state where CWD is known to occur most frequently, potentially positive animals are taken off the landscape. Important thresholds for CWD within a population include first detection, 5% prevalence, and greater than 10% prevalence. These thresholds will direct how and when license allocation and access efforts will be applied to combat CWD.

Success will depend on widespread buy-in from stakeholders. As such, the Department will strive to incorporate the best available, emerging evidence into its management approach in a fully transparent manner. Communication, education, and outreach will be a critical focus of the Department to maintain support and engagement with this important and ongoing issue.

INTRODUCTION

Chronic wasting disease is an emerging threat to big game management. It is caused by an abnormal “prion” protein and causes irreversible damage to the nervous system, resulting in death (Williams, 2005). Infection through contact with contaminated bodily fluids or environments results in a long course of disease. This begins with a several-months-long incubation period where the animal displays no changes; followed by a lengthy subclinical period where the animal appears healthy but becomes more susceptible to other causes of mortality such as predation and vehicle collision (Krumm et al. 2005; Krumm et al. 2010); and ending with a period of rapid decline and invariable death (Williams 2005; Figure 1.1). Conventional tools used to treat or prevent diseases caused by bacteria or viruses are not available for prion diseases.

Chronic wasting disease was first recognized in free-ranging cervids in portions of Colorado and southeastern Wyoming in the early 1980s but received limited interest from managers outside those areas (Miller and Fisher, 2016). However, beginning in the late 1990s, detections in several other jurisdictions revealed that the footprint of CWD-infected areas was much larger than previously understood. Meanwhile, the apparent expansion of the disease, the limited yet sobering understanding of it, and the recognition of multiple risk factors for the introduction and spread of the disease within the state, raised the alarm for the North Dakota Game and Fish Department. To address these concerns, the Department produced the Chronic Wasting Disease Prevention and Contingency Plan in 2002 (Gerads et al. 2002).

Recommendations from this plan, hereafter referred to as the *2002 Plan*, set the framework for surveillance, prevention and management of CWD for the next two decades. The plan emphasized strategies to reduce the risk of CWD introduction in North Dakota and outlined general areas of management to be considered if the disease was ever detected. Held against current understanding of CWD, the Department’s approach (informed by the *2002 Plan*) likely helped to slow the spread of CWD into and within the state. Despite these efforts, CWD was detected for the first time in a deer harvested in south central North Dakota in 2009, adding North Dakota to a growing list of positive states. The disease remained relatively confined to this area for nearly a decade, but beginning in 2018, detections turned up in the northwestern part of the state and the apparent prevalence in some areas appears to be growing. As of this writing, CWD has been detected in eight hunting units.



**23
MONTHS**



Figure 1.1: Progression of CWD in an infected mule deer. The average period between exposure and death was 23 months in an experimental setting. The bottom picture is a clinically sick CWD-infected mule deer from unit 3F2 in 2019. Most infected deer will look and act normal for several months before displaying signs of illness. Infection status cannot be determined by appearance.

Since the *2002 Plan* was drafted, understanding of CWD continued to evolve. Several studies justified early concerns about CWD and validated anecdotal observations by demonstrating that high infection rates can erode the long-term resilience of a population, shift age structure, and can even become an underlying driver of population declines (Miller et al. 2008, Monello et al. 2014, Edmunds et al. 2016, DeVivo et al. 2017). Understanding of the pathogenesis, epidemiology and ecology of the disease also substantially expanded (Escobar et al. 2019, Mathiason, 2021). This knowledge, paired with several decades of trial-and-error management from across North America, provides a much more robust framework for addressing CWD, *best summarized in the Association of Fish and Wildlife Agencies Technical Report on Best Management Practices for Prevention, Surveillance, and Management of Chronic Wasting Disease (AFWA 2018)*.

The following document, hereafter referred to as the *2023 Plan*, represents the Department's concerted effort to evaluate the state's current management approach, fold in 20 years of new information, and chart a best path forward within the specific social and political culture of North Dakota. It is not intended to be the authoritative roadmap for *what* decisions will be made, but rather, a guideline for how evidence will be collected, assessed and used to make decisions in a consistent manner that can also be adapted as new information is received.

Although understanding of CWD has grown considerably in recent decades, the consequences of CWD have yet to be fully observed. Thus, the immediate cost to long-term benefit calculation can be difficult to accept. However, NDGF has been granted legal authority by the North Dakota Century Code and is the agency charged with protecting the big game resources of the state. Not addressing CWD would be a failure by the Department to uphold its responsibility to protect, conserve and enhance wildlife and their habitats.

SECTION 2

MANAGEMENT OBJECTIVES AND GOALS

The broad objectives of effectively managing CWD are to:

- a Slow the spread and establishment of CWD into new areas of the state.
- b Keep prevalence to a minimum in areas where CWD is established by reducing transmission of the disease.

Science continues to fully characterize the progression of CWD in a herd, yet current evidence reveals a general pattern (Figure 2.1, 2.2). Once established in a herd, the disease can be maintained for over a decade at infection rates at or below the ability to be reliably detected (<1%). This is followed by a several-year period of steady increase in prevalence, after which infection rates climb exponentially. Documentable population-level impacts will occur when the infection rates, and resulting mortality, exceed a herd's ability to compensate. This "threshold" will depend on several factors, including existing causes of mortality (hunting, winters, other diseases, etc.), productivity of the herd and ingress of deer from elsewhere. It will differ in every herd but was as low as 20-30% in Western herds where the impacts have been documented (Edmunds et al. 2016; DeVivo et al. 2017).

An issue confounding this progression is environmental contamination. As infections increase, the number of prions deposited on the landscape through bodily fluids and decomposed carcasses also increase. Since prions remain infectious on the landscape for years, this buildup may eventually reach a point where contact with prions in the environment becomes the dominant mode of transmission (Almberg et al. 2011).

Management must focus on reducing the likelihood of reaching these important thresholds: introduction and establishment, expanded growth, dominant environmental transmission, and population-level impacts. This is accomplished through identifying known risk factors associated with these phenomena and mitigating them to the extent possible.

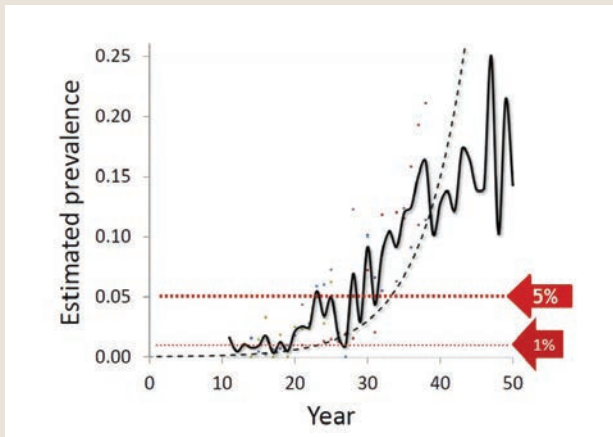
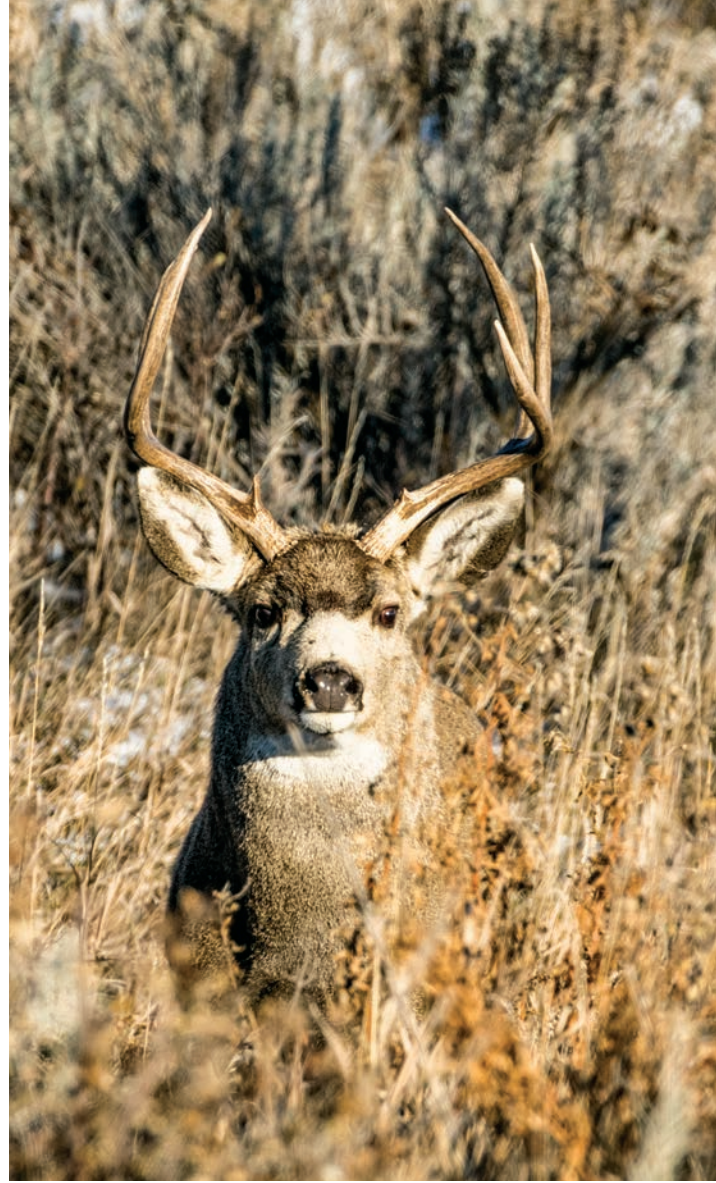


Figure 2.1: CWD epidemic curves in Colorado mule deer (Miller et al. 2000, EFSA Panel on Biological Hazards 2018, 2018 CPW CWD Management Plan; used with permission). The dashed black line represents modeled, predicted trajectory from Miller et al. 2000, while the solid line represents the combined surveillance data from five Colorado mule deer herds over 15-21 years (EFSA Panel on Biological Hazards 2018).

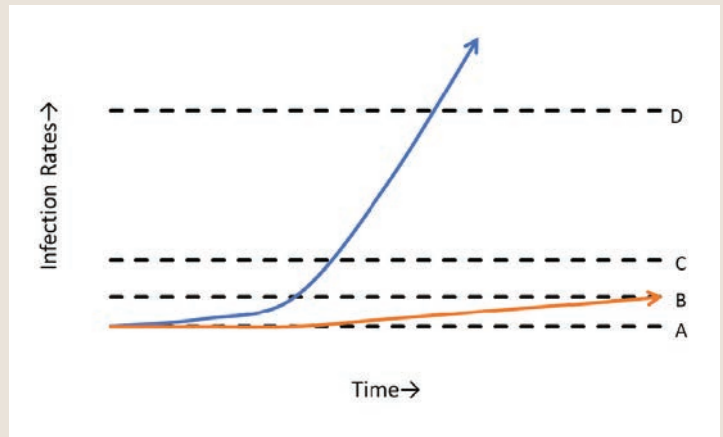


Figure 2.2: Theoretical progression of CWD over time in an unmanaged herd (blue arrow) and a herd where management goals have been met (orange arrow). Dashed lines represent important benchmarks around which CWD management is crafted (see subsequent management sections). A = introduction of CWD into herd; B = tipping point, above which rapid annual increases are expected; C = early uncontrolled spread; D = overt population level impacts become apparent. The exact infection rate for these benchmarks will vary and depend on environmental and biological factors, but it is assumed that B = 5%; C = 10%; and D = 20-30%.

SURVEILLANCE AND MONITORING

Effective CWD management depends on an accurate knowledge of where the disease is located and how common it is in established areas. There is widespread public support for CWD testing (Vaske and Miller 2021); however, a common misconception is that testing animals for CWD helps control the disease. Controlling the disease is only achieved through management actions, described in later sections.

Three primary purposes of testing animals for CWD include:

- 1 To detect the disease soon after it has spread to new areas. Alternatively, to *confidently* predict the absence of disease in an area.
- 2 To monitor changes in infection rates over time.
- 3 To provide a service to hunters who are concerned about exposure to CWD and wish to make a more informed decision about whether to consume the venison (see note below).



The first two purposes can be categorized under the umbrella term “CWD Surveillance,” which is the process of testing enough animals in a population to make statistically valid inferences about the disease in that area. While the simple infection rate (number positive/number tested) is important, a narrow confidence interval is also required to make informed decisions (Table 3.1). Generally speaking, the more animals tested, the better the data.

The third purpose aligns with the Centers for Disease Control and Prevention’s recommendation to strongly consider having an animal tested before consuming the venison (Centers for Disease Control and Prevention, 2022). It is important to note that current CWD tests have not been validated as food-safety tests. While it provides an indication of the likelihood of infection status, testing cannot be assumed to be 100% reliable. More information about human health concerns can be found on the CDC website.

Table 3.1: Statistical confidence in disease status in a population, given the number of animals tested.

Number of Animals Tested	Confidence in Disease Free Status (<1%) if all Animals Test Negative ^a	95% Confidence Interval if 5% of Animals Test Positive ^b
40	33.1%	1.4 – 16.5%
100	63.4%	2.1 – 11.2%
200	86.6%	2.7 – 9.0%
300	95.1%	3.1 – 8.1%

^aStatistical confidence that a surveyed population has an infection rate less than 1% if given number of animals tested negative. For example, if 100 animals sampled from an area all tested negative for CWD, we can be 63.4% confident that the infection rate is less than 1%.

^bEstimated infection rate in an area if 5% of a sample tests positive for CWD. For example, if 5 out of 100 animals test positive, we can be confident that the prevalence in the population is between 2.1 and 11.2%. The interval narrows as more animals are tested.

The CWD surveillance strategy, outlined in the *2002 Plan*, primarily consisted of passive, voluntary submissions from hunters. Despite Departmental communication efforts that sometimes approached a saturation point, as well as substantial contributions from taxidermists and meat lockers, the portion of deer tested verses available gun licenses rarely exceeded 5% in a unit. This would translate to less than 100 samples, and a confidence in disease free status below 63.4%. As a result, management decisions based on the predicted disease status of a unit had to be made using crude data.

These shortcomings can be addressed in two ways. First, the management decision-making framework can become less reliant on surveillance data. In other words, management can become more proactive. Second, the surveillance strategy can be improved. While these are not mutually exclusive considerations, surveillance will be the focus of the remainder of this section.

2023 Plan:

Beginning in 2023, a deer gun unit will be surveyed less frequently but more thoroughly. Relative to other diseases, CWD progresses slowly. This means that annual changes are less meaningful than longer term trends. Therefore, the Department will focus resources on one-fourth of deer gun units annually, ultimately resulting in less frequent but more accurate prevalence estimates.

A sampling goal will be set at 10% of allocated deer gun licenses for a given year. A surveillance year will begin on January 15 to allow for the close of archery season (typically the first weekend in January). Once the goal has been reached, prevalence estimates will be calculated using conventional methods. Given their low surveillance value, fawns will only be tested if specifically requested through service testing avenues detailed below. They will not contribute toward the sampling goal.

Sources of samples will include:

1. Hunter-harvested animals provided via drop-off sites
2. Roadside check stations
3. Field staff sampling animals with known causes of mortality (e.g., starvation)
4. Taxidermists
5. Meat lockers
6. Roadkill, Department of Transportation contacts
7. Salvage permits
8. Clinical cases (see note next page)



Service Testing: The Department will continue to make testing available for hunters outside targeted units. This will be achieved through self-sampling mail-in kits, as well as drop-off sites and staffing available at district offices at a reasonable level. Wildlife Health Laboratory (WHL) will provide all supplies, training and technical support when possible, but ultimately, district offices must ensure they have sufficient capacity to provide this service. At the current expected volume of samples, the Department will handle the cost of testing.

Elk and Moose: Current sampling of elk and moose primarily consists of voluntary submission of hunter-harvested samples. In 2021, this totaled 49 (16%) elk and 97 (24%) moose, which was a respectable portion of the 301 elk and 405 moose harvested that year. CWD has not been detected in either species in North Dakota to date. As such, current, passive surveillance will be maintained in these species with the understanding that disease status in sympatric deer herds will be used to guide management decisions. Additional consideration specific to elk and moose will be given when the disease status changes in these species.

Clinical Cases: It is imperative that the Department maintains a statewide, year-round pathway in which sick or dead cervids can be reported, followed up on, and tested. Such cases have been critical in alerting wildlife agencies to the presence of a disease of concern, long before any concerted surveillance effort. WHL staff will continue to work with field personnel to maintain this pathway to the extent possible, recognizing that Departmental responsibilities are numerous, and resources finite.



SECTION 4

MANAGEMENT

A. Baiting:

To reduce the risk of CWD transmission and establishment through unnatural concentrations of cervids, states should eliminate baiting and feeding of all wild cervids (AFWA 2018).

The likelihood of becoming infected with a pathogen is influenced by several factors, including how frequently an individual encounters a given pathogen and the sheer amount of a pathogen they come into contact with during a single exposure event. One exposure does not guarantee infection, but as these two factors increase, the likelihood of infection increases. Managing a disease in a population is founded on trying to create a net reduction in these factors, while accepting that some factors cannot be controlled.

Baiting is restricted in 23 of the 29 states where CWD has been detected in the wild, including the three states that border North Dakota. The practice of baiting causes unnaturally high densities of deer for a longer portion of the year, while also repeatedly bringing animals to the same small area. Baiting increases the risk of CWD

transmission by artificially increasing the number, intensity and duration of direct (animal to animal) and indirect (animal to contaminated material or environments) contacts among individuals. The disease risk is founded on at least six core principles (with select references):

1. CWD is spread through direct and indirect contact (Miller et al. 2004, Mathiason et al. 2009).
2. Baiting and feeding causes higher deer concentrations and extensive face-to-face contacts, increasing direct and indirect contacts among deer (Garner 2001, Thompson et al. 2008).
3. Baiting and feeding has been shown to increase the transmission of several other diseases in free ranging wildlife that are spread through similar mechanisms (e.g. bovine tuberculosis, Cosgrove et al. 2018; brucellosis, Sorensen et al. 2014; avian influenza, Soos et al. 2012).
4. When deer are artificially congregated under captive settings, CWD spreads more rapidly and to substantially higher rates than documented in wild populations (Keane et al. 2008).
5. Baiting and feeding breaks down the natural spatial segregation of maternal family groups, resulting in increased direct and indirect contact of unrelated animals that typically don't associate (Blanchong et al. 2006).
6. Compared to natural browse sites, rubs, salt licks and waterholes, mule deer preferentially and more intensively visited artificial feed sources such as grain piles where they had more contacts with the environment (Mejia-Salazar et al. 2018).

Scientific analysis of baiting restrictions is typically complicated by the absence of a negative control. Most jurisdictions either impose restrictions following the detection of CWD, or never permitted the practice in the first place. As a result, it is not possible to evaluate the progression of disease with and without this intervention. A legitimate attempt to do so would require identifying two near-identical populations in identical landscapes, introducing CWD into both, and evaluating the disease status after a minimum of 10-20 years. This study design is neither feasible nor ethical, forcing managers to base decisions on core principles listed above. However, Saskatchewan offers a cautionary, albeit anecdotal, tale. The rise in infection rates in mule deer from approximately 3% to 70% in 15 years in an area where baiting is widespread and was never regulated, is the fastest increase documented in free-ranging cervids (Saskatchewan Ministry of Environment, 2022).

The Department receives many questions concerning disease risk and food plots. CWD transmission dynamics suggest the risk is lower for food plots compared to baiting and feeding. Animals spread across a larger area means they have fewer direct contacts than if they were feeding around a pile, substantiated by preliminary data from an ongoing Michigan study (S. Courtney, personal communication, July 26, 2022). Forage is less contaminated with urine, saliva, feces, or contaminated soil, than grain offered on the ground. Once depleted, a particular area of the food plot no longer attracts repeated, intensive visits. While the subject of disease risk and food plots is an area of current research, the Department has drafted best management practices to consider for food plots in areas where CWD is established, available in the *Wildlife Depredation and Response Policy and Procedures* document.

Skeptics of baiting restrictions argue that the existence of transmission risk from natural deer behavior (browsing and grooming, winter yarding, etc.) voids any effort to reduce it. This misses the point, as the ultimate goal of a baiting restriction is to *slow* the spread. No sincere effort to manage risk depends on the ability to control *all* risk. Furthermore, the existence of natural transmission does not justify actions that can accelerate it. Given the significant threat posed by CWD, voluntarily perpetuating increased transmission is at odds with the conservation ethic and in direct opposition to the Department's mission to protect, conserve, and enhance fish and wildlife populations.

UPDATE: *The topic of baiting has a long, contentious history in North Dakota. Legislative efforts for a statewide ban (2007, 2009) and statewide legalization (2023) have failed, but not without wide-ranging, spirited debate. To date, the Department has attempted to navigate a middle ground, balancing the voluntary disease transmission risk presented by baiting with the personal preferences of those who enjoy the practice. This issue was carefully considered when the 2023 Plan was originally drafted and revisited in the spring and summer of 2023. Born out of those discussions was a framework for how the Department could further improve surveillance data, open a pathway by which a baiting restriction could be rescinded, and remain faithful to its obligation to mitigate voluntary CWD transmission risk. That framework has been added on the next page.*

2023 Plan:

The Department will continue to reduce the risk of CWD transmission through its ability to regulate baiting as a method of take. Baiting will be restricted via CWD proclamation in any deer gun unit that falls within 25 miles of a previous detection.

Example language, taken from the 2022-23 CWD Proclamation, may include:

It shall be unlawful for an individual to hunt big game over bait or place bait to attract big game for the purpose of hunting in deer hunting units 1, 2B, 3A1, 3A2, 3A3, 3A4, 3B1, 3C, 3D1, 3D2, 3E1, 3E2, 3F1, 3F2, 4A, 4B, 4C, 4D, 4E and 4F. In addition, it shall be unlawful for an individual to hunt big game over bait or place bait on any North Dakota Game and Fish Department wildlife management areas. As used herein, bait includes grain, seed, mineral, salt, fruit, vegetable nut, hay, any naturally derived scent or lure (e.g. urine), or natural or manufactured food placed by an individual. As used herein, baiting does not include agricultural practices; gardens; wildlife food plots; agricultural crops; livestock feeds; fruit or vegetables in their natural location, such as apples on or under an apple tree; or unharvested food or vegetables in a garden. This ban does not apply to wildlife management activities conducted by or under the direction of the North Dakota Game and Fish Department.

Surveillance data will be used to evaluate the baiting restriction status of a unit. Restrictions may be removed if a minimum sampling requirement is met within a calendar year and all tests are negative for CWD (Figure 4.1). The minimum requirement is 10% of the unit's gun deer license allocation, consisting of adult deer. The tally will include animals harvested during gun, muzzleloaders and archery seasons as well as other sources specified in Section 3. If the sampling goal is not met or CWD is confirmed in a unit, the baiting restriction will remain. If CWD is detected within 25 miles of a unit but the minimum sampling requirement is met, restrictions will not be applied.



Figure 4.1: Decision matrix for annual baiting status review.

While the Department does not have authority to restrict recreational feeding of wildlife, it will strongly discourage this practice through outreach and communication efforts. It will also support efforts by local municipalities that are considering such ordinances.

It is recognized that some Departmental activities, such as depredation response, may have the unintended consequence of artificially concentrating deer, contributing to disease risk. When such activities occur in CWD-detected areas, strategies will be designed and carried out in a manner that balances the Department's responsibility to address the depredation issue, with the obligation to minimize risk. More information can be found in the Department's *Wildlife Depredation and Response Policy and Procedures*. In areas where CWD is established, the Department will also address external causes of unnaturally high animal densities (e.g., grain spills, etc.) through outreach and education efforts and assist when appropriate.

B. Carcass Transportation and Disposal:

The movement and improper disposal of infected cervid carcasses is a known risk for introducing CWD into new areas (AFWA 2018).

Prions that cause CWD are extremely resistant to environmental degradation and remain infectious on the landscape for a long time. In a proof-of-concept study, mule deer became infected with CWD when placed in a paddock where infected carcasses had been left to decompose for 1.8 years (Miller et al. 2004). The actual length of time required for prions to break down in the environment likely depends on several factors but is generally assumed to be several decades (Georgsson et al. 2006). As a result, infected carcasses transported and discarded on the landscape present one way that CWD may be introduced into new areas.

While it should be assumed that nearly all portions of an infected carcass contain prions, the greatest concentration is found in the nervous and lymphatic tissue (Fox et al. 2006; Li et al. 2021). Therefore, the risk of CWD introduction posed by moving these parts can be mitigated through two broad strategies: restricting movement or ensuring appropriate disposal.

The *2002 Plan* focused on the former by preventing transportation of high-risk carcass parts from positive states and units where CWD had been detected. This provided value at a time when the state was assumed to be CWD-free. The disease has since been detected in several parts of North Dakota, and it must now be assumed that there is a possibility of harvesting a CWD-positive deer anywhere in the state. Thus, the *2023 Plan* will transition to focus on appropriate disposal of high-risk carcass parts, regardless of where an animal is harvested. In most situations, the most widely available, effective, and therefore, practical method of disposal is via landfill (Jacobson et al. 2009).

2023 Plan:

Given the high local infection rates found in other jurisdictions, interstate transportation restrictions will remain in place. Intrastate transportation restrictions will be replaced by disposal requirements. Regardless of where an animal is harvested in North Dakota or what method is used (e.g., archery versus gun), high-risk carcass parts transported out of the gun unit of harvest must be disposed of through an approved means. As before, this requirement will be applied through the annual CWD proclamation. Example language may include:

- Intrastate Transportation: Whole carcasses of cervids harvested within North Dakota may be transported to a licensed taxidermist, game processor, or place of residence.
- Carcass Waste Disposal: All carcass waste (material not used for consumption or preserved for taxidermy) transported out of the gun unit of origin must be disposed of via landfill or waste management provider. Taxidermists and commercial processors receiving intact carcasses or carcass parts must assume responsibility for appropriate carcass waste disposal.



- Out of State Movement: It will remain unlawful to transport into North Dakota the whole carcass or carcass parts of any cervid harvested outside North Dakota except lower-risk portions of the carcass. This list of exceptions may change but could include:
 - Meat cut and wrapped either commercially or privately.
 - Quarters or other portions of meat with no part of the spinal column or head attached.
 - Meat boned out.
 - Hides with no heads attached.
 - Skull plates with antlers attached having no brain tissue present.
 - Intact skulls with no visible brain or spinal cord tissue present that have the eyes, lower jaw, tongue, salivary glands, tonsils, and attached lymph nodes removed.
 - Antlers separated from the skull plate.
 - Upper canine teeth, also known as "buglers," "whistlers," or "ivories."
 - Finished taxidermy heads.

This change will require a shift in hunting tradition for many, while also placing responsibility largely in the hands of hunters. As such, a concerted education and outreach component will accompany this change. These will include, among other things:

- Working with landfills to develop BMPs, possible free or discounted carcass drop off sites during portions of the year, and seasonal locations best suited to bury carcass waste.
- Working with solid waste haulers to develop consistent guidance that can be communicated to the public.
- Notification system (signage, phone notification, OnX layer) notifying hunters that they are in the vicinity of a previous detection.
- Taxidermist and game processor training effort.
- Offering disposal dumpsters in limited locations.

Importantly, surveillance data will be used to determine where hunters are most likely to harvest CWD-infected animals, allowing the Department to focus outreach efforts where they are most needed.

C. Harvest Management:

An important practice for managing CWD prevalence in infected populations is to utilize harvest or other removal mechanisms to manage prevalence by: 1) targeting the portion of the population most likely to have CWD, 2) targeting animals in known CWD hotspots [localized areas with high infection rates], 3) targeting timing of removal to most effectively remove infected animals, and 4) reduce cervid density in CWD positive areas with high density populations (AFWA 2018).

Recent evidence from Western states has shown a strong relationship between sufficient, sustained harvest pressure and long-term suppression of CWD (Conner et al. 2021). In Colorado, hunting areas that maintained or increased license numbers over a 16-year period saw relatively flat disease prevalence trends, while the largest increases in CWD infection rates were paired with the largest declines in hunting pressure (Miller et al. 2020). This substantiated earlier modeling efforts that suggested that the most effective management strategy is hunting pressure that focuses on the segment of the population having highest prevalence while also reducing overall deer densities (Jenelle et al. 2014; Potapov et al. 2016).

Consequently, hunter harvest offers the most effective and publicly acceptable intervention when applied at sufficient intensity in areas where CWD is known to occur. Following the Department's core principle of relying on hunters to manage deer populations, the **2023 Plan** involves focusing hunting pressure on the segment of the population with the highest infection rates, and when appropriate, reducing overall deer numbers in deer gun units that have reached certain thresholds of infection rates. By removing CWD-positive animals from the landscape sooner, their impact to CWD transmission is reduced. Furthermore, lower densities discourage dispersal of potentially infected animals. The Department will use an adaptive management framework in this effort (WAFWA 2017). This means that harvest management will be applied, evaluated, and refined as new field data and scientific evidence becomes available.

2023 Plan:

As detailed in Section 3, surveillance will be conducted in a deer gun unit once every five years to generate a prevalence estimate that will determine which management options will be instituted. The success of the approach will then be evaluated five years later, based on new surveillance data. Benchmarks are further explained in Section 2.

Detection: It should generally be assumed that the first case of CWD detected in a herd is neither the first, nor the only case of the disease in the area. While it does not necessarily mean the disease has become established, the possibility may be imminent.

- License allocation will be based on current inputs and long-term harvest goals. According to a recently developed adaptive management plan, this approximates 15% of the previous winter's deer density, portioned to 40:60 antlerless to antlered harvest (Nagy-Reis et al. 2021).

>5% Prevalence: Local transmission is likely occurring within a herd. Equally important, a tipping point is approaching, at which large annual increases in infection can be expected. Because prevalence is calculated at a deer gun unit level, localized areas with dramatically higher infection rates likely exist within the unit.

- Using winter aerial survey data completed within the previous three years or other available metrics (e.g., harvest density), harvest goals will be increased to 25% of the estimated, winter deer density, portioned to a 30:70 antlerless to antlered ratio with an assumed 70% hunter success rate.
- All refuge permit requirements will be eliminated if applicable.
- The Department will work to expand access in identified localized areas with higher infection rates during

the existing hunting season structure by using the hunter-landowner contact program, PLOTS, and any other existing or future programs.

- Unfilled deer gun lottery licenses may be validated for muzzleloader and archery seasons.
- The harvest goals will be maintained for five years. Field data, including winter aerial survey densities, regular deer gun overall harvest densities, and the percentage of deer classified as antlered will be used to determine whether goals are being met. Annual adjustments to license allocations will be made as necessary.
- The management strategy will be evaluated after five years when the new CWD prevalence estimate becomes available.

>10% Prevalence: Infection rates are likely increasing substantially on an annual basis. The herd now presents a significant risk to adjacent areas as infected animals disperse. Substantial, localized environmental contamination may be occurring that will serve as a long-term infection risk.

- Additional management options will be considered with internal and external input. These may include:
 - Initiate special management hunt in disease subunit.
 - Lengthen or adjust the timing of seasons.

It is important to distinguish between removal using hunting ("harvest management") versus agency directed culling methods such as the use of sharpshooters. While there are examples of successful agency directed culling programs in other jurisdictions (New York, New York Department of Environmental Conservation 2015; Illinois, Mateus-Pinilla et al. 2013; Minnesota for bovine tuberculosis, Carstensen et al. 2011), it is difficult to maintain public support for the multi-year, sustained effort typically required to achieve success. Programs in Alberta and Wisconsin ultimately failed because they lacked public support and/or set unrealistic expectations (disease eradication vs. suppression) and were prematurely abandoned (Holsman et al. 2012, Manjerovic et al. 2014, Smolko et al. 2021). **As such, agency directed culling would only be considered in North Dakota as a last resort.** Outlining a more specific list of parameters for such an intervention is outside the scope of this plan.

SECTION 5

EDUCATION, COMMUNICATION, OUTREACH, ENFORCEMENT

Agencies should foster community partnerships and work collaboratively to find support for CWD management. It is important that all affected groups be engaged in the CWD management process. (AFWA 2018)

Effective CWD management depends on continued support and engagement from hunters and non-hunters alike. The Department will nurture this through comprehensive and ongoing education, communication, outreach and enforcement efforts. These will include maintaining a technical presence at advisory board meetings and sport shows, organizing stakeholder meetings and workshops, visiting with hunters in the field, and incorporating content into education curriculum. In addition, it will continue to deliver updates and content through the Department's various mediums.

Enforcement is an essential aspect of CWD management. Efforts will include providing law enforcement

staff time for focused CWD efforts such as compliance checks or investigating violations including illegal carcass transport, baiting, and other restrictions relative to CWD. Overall compliance should increase with increased law enforcement actions, thereby reducing or decreasing the likelihood of CWD introduction and spread through illegal pathways.

Furthermore, as hunter access continues to be a major factor in the success of harvest management to combat CWD, outreach efforts will be especially focused in areas with high infection rates. Efforts will include landowner surveys and visits, as well as local public stakeholder meetings.

SECTION 6

LIVE ANIMAL MOVEMENTS

To eliminate the risk of anthropogenic movements of CWD in potentially infected live animals, states, provinces and tribes should prohibit the movement of live cervids (AFWA 2018).

The transportation of infected live cervids is a well-documented cause for spreading CWD to new areas (eg, Argue et al. 2007, Minnesota Board of Animal Health 2021). High densities of susceptible animals in a confined setting lends itself to rapid disease spread and can create a continual source of infection (Keane et al. 2008). Prudent guidance to address this risk was established in the *2002 Plan* and is reinforced here.

2023 Plan:

A. Movement of free-ranging cervids

The Department will not translocate CWD-susceptible cervid species for the purposes of wildlife management or conservation. As per the Department's policy on nuisance animals (found elsewhere), moose, elk, mule deer and whitetail deer are not to be immobilized and translocated within North Dakota. Lethal removal is the only option that may be considered.

Game species are not eligible for wildlife rehabilitation, according to Department policy. Animals taken into possession in violation of this policy will be humanely euthanized using approved methods and disposed of appropriately.

B. Captive cervids

The Department lost legal authority over farmed elk in the 1980s. Any requirements for import or possession of this species are solely governed by the North Dakota Department of Agriculture, as administered by the North Dakota State Board of Animal Health.

The Department has shared legal authority over remaining "protected" animals including white-tailed deer, mule deer and moose. Private ownership of these species requires a permit from the Department according to North Dakota Century Code Chapter 20.1-09. However, these are managed and issued by the BoAH on the Department's behalf, according to a Memorandum of Understanding. Privately owned cervids are also considered Category II non-traditional livestock (NTL) that fall under authority of the BoAH, requiring a separate license contingent on meeting inventory, fencing, and identification requirements (NDCC 48.1-09).

Finally, importation of nontraditional livestock requires animals to pass a satisfactory risk assessment for chronic wasting disease conducted by the state veterinarian's office (48.1-09-03-01). However, the BoAH has the ability to overturn the state veterinarian's decision to deny importation, and has voted to do so in the past. Thus, risk assessment alone is not the sole determinant of whether NTL are imported.

The Department represents the hunting public in North Dakota and is charged with protecting the resource. It will work with the BoAH to ensure current guardrails are as effective as possible in managing risk, given the authoritative constraints detailed above. Efforts will include:

- Providing input and expertise on proposed imports through attendance at all BoAH and Nontraditional Livestock Subcommittee meetings.
- Assisting when NTL escape confinement. Owners of farmed elk must report escapes to the BoAH within one business day and then have 10 days to recapture or destroy the animal (NDCC 48.07-01-11). Owners of Category II NTL (including deer) must report escaped animals within one day and recapture or destroy the animal within four days (NDCC 36-09-01-08). Both animals can be disposed of immediately if public safety, or the health of domestic or wild populations is at risk. The state veterinarian can authorize the seizure, capture, or destruction of an escaped animal as indicated. The Department will provide all available support in expediting this process by promptly notifying the BoAH of escapees, monitoring locations of escapees, assisting with capture or destruction at the discretion of the state veterinarian, and providing disease testing expertise.

SECTION 7

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