

Wyoming Chronic Wasting Disease Management Plan



Wyoming Game and Fish Department

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Acknowledgments

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Message from the Director

Message from the Wyoming Game and Fish Department Director, Brian Nesvik



Chronic wasting disease (CWD) was first discovered in Wyoming more than three decades ago. Since that time, the Wyoming Game and Fish Department has strived to gain a better understanding of the disease through research and on the ground monitoring. We have spent years working in cooperation with other researchers evaluating vaccines, considering genetics, and searching for diagnostic test options, all while gathering over 30 years of prevalence data.

We are still learning more about this disease and its effects on Wyoming's deer and elk populations, but for the first time, there is clear evidence that CWD is adversely affecting the overall health and viability of some herds.

As wildlife managers, it's our job to tackle this difficult issue, but we can't do it alone. Wyoming's wildlife are public resources highly valued by our citizens and it's in this spirit that the Department launched a robust collaborative CWD Working Group made up of members of the public. We hosted public meetings and took public comment before and after the group did their work to ensure this plan considers a wide range of ideas. Recommendations on the management actions we considered in developing this revised CWD management plan are strongly based on the newest science and those ideas we heard from the public. The time and commitment the Department and the CWD Working Group dedicated to the development of this document was substantial and greatly appreciated.

Our's and the public's work doesn't end with the creation of this plan. Our next steps are putting these management actions into practice and adapting this plan based on what we learn. This plan outlines some immediate actions we can do to curb this disease, but many of the strategies listed here are long-term efforts that may take over a decade to see through to completion. Some of the actions are things we can do as wildlife managers, while others are things we will ask the public to help us with.

As we move forward to take on this issue, I ask for people to remain engaged. We will provide information to the public on the management actions we deploy, and there may be changes to regulations. If you have a question about what we are doing, ask, and when there are public meetings, please attend.

As I mentioned earlier, the Department cannot take on this issue alone. We will continue to conserve wildlife and serve people in the face of this challenging disease that affects deer, elk, and moose in Wyoming.

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Definitions

The following words or terms are found within this Plan or other popular articles and peer-reviewed publications related to chronic wasting disease.

Age structure: the distribution of animals by age within a population. Often expressed as relative numbers of animals by given age categories, such as fawns, yearlings, mature animals, or by individual ages: 0, 1, 2, 3, 4, ... years of age.

Bovine spongiform encephalopathy (BSE): a transmissible spongiform encephalopathy (see below) affecting cattle, caused by a prion.

Captive cervid herd: a herd of deer or elk that is confined and managed as a herd of domestic animals would be.

Central nervous system: the brain and spinal cord.

Cervids: a mammal of the family Cervidae (deer family), which includes white-tailed deer, mule deer, elk, and moose.

Clinical signs: something abnormal, relevant to disease in an animal, and detected by an observer. Animals are considered to have clinical signs instead of “symptoms.”

Culling: the intentional removal of animals from a population to improve the status of the base population. Generally, culling is accomplished via lethal removal usually by governmental employees or contracted agents.

CWD-positive: the designation for an animal determined to have been infected with the CWD prion.

CWD endemic area: geographic area in which animals affected with CWD are found.

Environmental contamination: the process whereby prions shed from carcasses or from live animals via urine, feces, and saliva, enter the environment (soils, plants, surfaces) and remain infectious to cervids.

Epidemiology: the incidence, distribution, and possible control of diseases and other factors relating to health.

Free-ranging: refers to cervids that are not confined within a high fence and are able to move freely across the landscape.

Herd Unit: the delineation of a population of big game animals bound by natural (geographic) or human-made barriers that restrict interchange with adjacent populations to less than 10% of the population’s size. Herd unit boundaries should contain all necessary seasonal ranges (habitats) to accommodate the entire lifecycle of the animals in that population. Hunt areas are established within herd units to achieve harvest objectives and to distribute hunting pressure.

Lymph node: a small bean-shaped structure that is part of the body's immune system. Lymph nodes filter substances that travel through the lymphatic fluid, and they contain lymphocytes (white blood cells) that help the body fight infection and disease.

Monitoring: efforts to track changes and prevalence of a disease (e.g., CWD) once detected within a population over time.

Obex: the section of the brainstem between the brain and the spinal cord frequently used to test for CWD.

Population dynamics: the changes in population size and the factors affecting whether a population is stable, declining, or expanding.

Prevalence/Prevalence rate: the percentage of cervids in a population (herd unit) or hunt area that are CWD-positive at a point in time or over a specified period of time and is based on an adequate sample size and that is well distributed across the herd unit based on animal distribution.

Prion: an abnormal protein particle that is the cause of brain diseases such as CWD, scrapie, and Creutzfeldt–Jakob disease. Prions are not visible microscopically, contain no nucleic acid, and are highly resistant to destruction.

Retropharyngeal lymph nodes: lymph nodes (see above) located in the back of the upper throat of the animal. In harvested cervids, they are frequently used as the sample for CWD testing.

Surveillance: efforts to detect the occurrence of a disease (e.g., CWD), within a specific species and geographic area where the disease has not yet been documented.

Targeted surveillance: efforts to detect the occurrence of a disease (e.g., CWD) within an individual animal exhibiting clinical signs of the disease.

Transmissible spongiform encephalopathies (TSE's): diseases caused by abnormal forms of prions that convert normal cellular proteins to abnormal prions. The net effect of this conversion is the formation of plaques of protein in nervous or lymphoid tissue (usually the brain), which eventually create spaces or “holes” in that tissue. “Spongiform” refers to the sponge-like appearance of this tissue under a microscope, while “encephalopathy” refers to the resulting abnormal function of the brain.

Executive Summary

This Wyoming Chronic Wasting Disease Management Plan (Plan) provides general and strategic guidance for the Wyoming Game and Fish Department (Department) in the management of chronic wasting disease (CWD) in Wyoming cervid populations. These CWD management recommendations were developed with public input through a collaborative working group (CWD Working Group) process in coordination with the Department. This Plan will also guide Department internal and external communications and the development of informational and educational material regarding issues related to CWD.

Chronic wasting disease is a chronic, fatal disease affecting the central nervous system of members of the deer family (*Cervidae*). In Wyoming, CWD affects mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus canadensis*), and moose (*Alces americanus*). This disease was first documented in free-ranging mule deer in Wyoming in 1985, and has since been documented in all Wyoming cervid species and across most of the state. As of September 2019, CWD has been identified in 31 of 37 (84%) Wyoming mule deer herds, nine of 36 (25%) elk herds, and generally wherever white-tailed deer occur. Increasing prevalence and distribution of CWD has the potential to cause widespread and long-term negative impacts to Wyoming's cervid populations. Prevalence of this disease in chronically infected Wyoming deer herds has exceeded 40%, with one elk herd exhibiting nearly 15% prevalence. The Department will continue to conduct surveillance and monitoring to estimate the spatial distribution and prevalence of CWD at the herd unit level on a rotating basis throughout the state. The Department will strive to test 200 samples per herd unit over a three-year period to estimate prevalence. In addition to surveillance and monitoring, the Department will continue to provide avenues for testing of hunter-harvested cervids for the general public.

As the known distribution of CWD continues to expand throughout North America and elsewhere, viable disease management strategies are needed for free-ranging cervid populations given eradication is not currently feasible. As such, the Department will implement and evaluate management actions to slow the spread and/or reduce/limit prevalence of the disease statewide while maintaining healthy and sustainable wildlife populations. The desired long-term objective for managing CWD in Wyoming is to reduce or limit prevalence and spread where possible.

This Plan presents a suite of prospective management strategies designed to reduce CWD prevalence by mitigating artificial sources of cervid concentration, utilizing hunter harvest to maximize the removal of positive animals, and pursuing or enforcing statutory and regulatory provisions regarding CWD. To reduce artificial cervid concentrations, the Department will pursue statewide or local feeding bans where possible, identify points or sources of concentration, and develop strategies to decrease cervid concentrations. Hunter harvest strategies will be designed to increase harvest of mature male deer and reduce cervid densities in areas of concern. Such experimental harvest management strategies will be implemented over a sufficient timeframe (i.e., ten years or longer) to allow for robust evaluation of their efficacy. Requisite outreach, communication, and public involvement will be key to garner and maintain public support for the successful implementation of long-term CWD management strategies. Evaluations of applied management strategies will be shared with the public as well as appropriate agencies and institutions within and outside Wyoming to bolster the broader understanding of CWD management.

The Department will identify CWD issues specific to each cervid herd where appropriate. These issues will be chronicled within the Department's annual Job Completion Reports and will be considered when formulating annual management recommendations and long-term objectives. The Department will continue to surveil for CWD in areas where this disease has not yet been documented, including within elk herds associated with feedgrounds. Due to the complex nature of elk feedgrounds and disease management, the Department will initiate a localized collaborative process in Teton, Sublette, and Lincoln counties to gather stakeholder input on feedground issues resulting in the development of a supplemental disease management plan.

As resources allow, the Department will participate in CWD research and coordinate with other state, federal, tribal, and international agencies as well as entities of higher education, universities, and other researchers. In addition, the Department will develop a comprehensive communication plan to inform the public and garner support for the implementation of local and statewide CWD management strategies. Current and accurate CWD information and educational material will be provided to the public on an ongoing basis via the Department's website and other public and media outlets. Finally, the Department's internal CWD Management Team will meet regularly to chronicle, review, and evaluate applied management strategies throughout the state.

Goals and Purpose

This Plan provides guidance for the Wyoming Game and Fish Department to manage the prevalence and distribution of CWD within Wyoming's cervid herds. In addition, the Plan provides for the continued coordination of management strategies and research with other state, federal, tribal, and international agencies, as well as institutions of higher learning. Despite significant advances in our understanding of CWD over the past 40 years, there is still little published information on effective management strategies (Miller and Fischer 2016, Uehlinger et al. 2016). Regardless, it is incumbent upon wildlife managers to manage for healthy and sustainable free-ranging cervid populations even in the absence of proven CWD control strategies. In lieu of definitive CWD management measures, a long-term adaptive management approach will be developed for CWD management. Adaptive management enables the experimental application and thorough evaluation of CWD suppression strategies whereby lessons learned inform future management strategies. Given the nature of CWD epidemiology, this will require long-term planning, implementation, and evaluation to thoroughly understand the efficacy of any strategy. Utilizing an adaptive management framework to reduce the spread and prevalence of CWD will require the Department to invest considerable resources into public input gathering, communications, experimental design, evaluation, and data collection.

Experimental management strategies identified in this Plan strive to reduce CWD prevalence at the herd unit-level where possible and/or at smaller site-specific locations. The Plan includes a suite of actions local wildlife managers can implement and assess at a local or herd unit level to manage CWD prevalence with due consideration given to established population and herd composition objectives. Local wildlife managers will determine which actions are best suited to managing CWD for each herd unit or subpopulation given prevalence levels, suspected timeframe of CWD epidemiology, management framework, and local public input. This approach will provide maximum flexibility to maintain healthy big game populations while implementing disease management strategies vetted through public input.



Introduction

Chronic wasting disease is a chronic, fatal disease affecting the central nervous system of members of the deer family (*Cervidae*). In Wyoming, CWD affects mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus canadensis*), and moose (*Alces americanus*). This disease belongs to the group of rare diseases called transmissible spongiform encephalopathies (TSEs). These diseases are caused by abnormal proteins called “prions,” which are proteins devoid of nucleic acid. Prions have similar amino acid sequences compared to normal cellular proteins, but in a different conformation. Prions cause a conformational change in the normal cellular protein structure, and disease is induced when the normal cellular protein is converted into the abnormal prion protein. The accumulation of prions leads to central nervous system cell death (Forloni et al. 1993). The disease progresses as more nervous system cells are lost, ultimately ending in the death of the animal. There is currently no cure for CWD or other prion diseases, partly because the immune system of an infected animal does not recognize prions as a source of infection. Therefore, there is no immune response, making the development of a vaccine or other treatments very difficult.

Early in the course of CWD, animals show no clinical signs. As the disease advances, affected animals show weight loss, reluctance to move, excessive salivation, droopy ears, increased drinking and urinating, and lethargy. No immunity, recovery, or absolute resistance to CWD has been documented. This disease is always fatal, and most animals die from the disease within about 2.5 years of infection (Miller et al. 2012, Miller et al. 2008). However, natural genetic variation in host species can extend survival time following infection. Infected animals do not typically exhibit clinical signs until late in the course of the disease, resulting in the majority of hunter-harvested animals that test positive for CWD appearing to be in normal body condition. Infection can be detected in carcasses as well as in live animals, and diagnostic tests become increasingly reliable as CWD progresses (Miller and Fischer 2016). Chronic wasting disease is infectious, and prions are shed from several routes during most of the disease course, exposing other cervids either directly or through environmental contamination. Prions can persist for years in the environment, and their binding to soil elements (e.g., clay) enhances persistence and infectivity (Johnson et al. 2007). The environmental persistence of prions complicates disease management and control, especially once prevalence is high (Miller and Fischer 2016).

Initial modeling efforts predicted CWD would drive affected cervid populations to extinction (Gross and Miller 2001). More recent projections suggest CWD may have significant population-level impacts in Rocky Mountain National Park elk (Monello 2013, Monello 2014), Wyoming white-tailed deer (Edmunds et al. 2016), and Wyoming mule deer (DeVivo 2017). Other research suggests certain populations may be able to survive, bolstered by genetic selection and some level of hunting season restrictions (Robinson 2012, Williams 2014). Regardless, endemic CWD will likely depress some cervid populations at an unknown but potentially significant level. As such, management efforts designed to reduce the spread and prevalence of CWD are warranted.

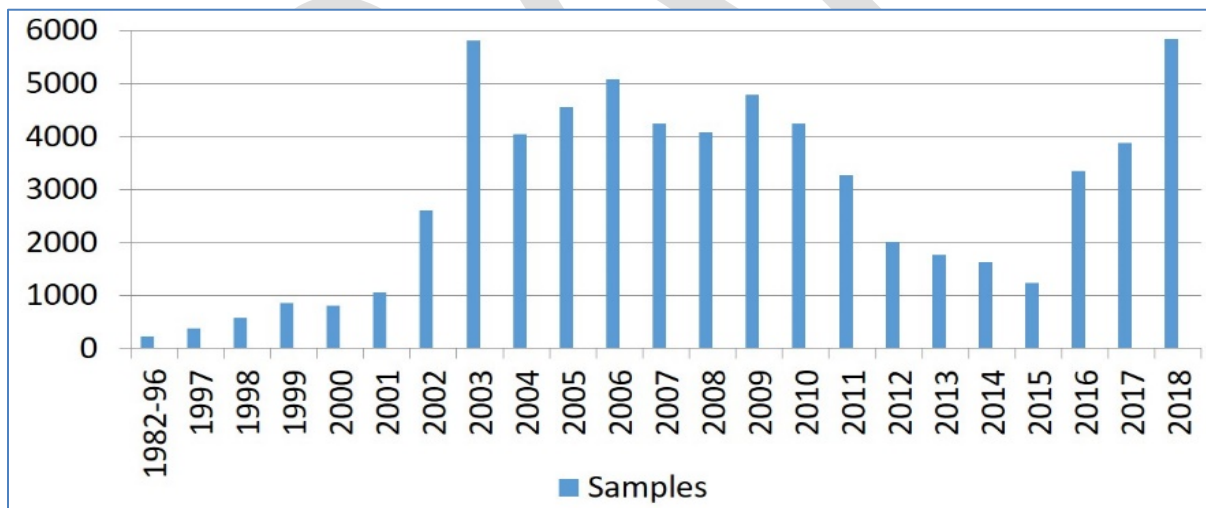
Chronic Wasting Disease in Wyoming

Chronic wasting disease was first recognized in 1967 in captive mule deer in a facility near Fort Collins, Colorado (Williams and Young 1980), and was later detected in Wyoming in the 1970s at

the Department's Tom Thorne/Beth Williams Wildlife Research Center north of Laramie. Initially, CWD was thought to be related to nutrition but was later identified as a TSE by Dr. E.S. Williams in 1978 (Williams and Young 1980). The timing of the introduction of CWD into Wyoming, as well as its origin, remains unknown. In Wyoming, this disease was first identified in free-ranging mule deer in 1985, elk in 1986, white-tailed deer in 1990, and moose in 2008.

Prior to 2000, CWD was poorly understood and of little interest at the national level. Starting in the late 1990s and early 2000s, concern over CWD rapidly increased as more jurisdictions began to detect the disease, and questions about human health arose. In 1996, bovine spongiform encephalopathy (BSE) was linked to variant Creutzfeldt-Jakob disease (vCJD) in people in the United Kingdom (Bruce 1997). The similarities of CWD and BSE led to human health fears over the consumption of CWD-positive cervids. From 2002 to 2012, human health concerns resulted in federal funding for CWD surveillance across the nation. This funding enabled Wyoming to greatly increase surveillance, although surveillance efforts waned after funding declined in 2010. Decreasing public and agency interest in CWD, from both a wildlife and human health perspective, led to further decline in disease surveillance efforts (Figure 1). That trend was reversed when emerging research identified the potential negative effects of CWD on western deer and elk populations (Geremia et al. 2015, Edmunds et al. 2016, DeVivo et al. 2017, Monello et al. 2014). Concern also increased within the Department when sharp increases in prevalence were detected in deer herds outside of what was then considered to be Wyoming's core endemic area (southeastern Wyoming), such as in the Bighorn Basin and along the eastern slope of the Bighorn Mountains.

Figure 1. Total CWD samples tested by year in Wyoming (1982-2018).



Since the discovery of CWD in 1985 in a free-ranging mule deer in southeastern Wyoming, this disease has now been documented throughout most of the state (Figure 2). As of September 2019, CWD had been identified in 31 of 37 (84%) of the state's mule deer herds, in nine of 36 (25%) of the state's elk herds, and generally wherever white-tailed deer occur in Wyoming (white-tailed deer herd units are loosely defined in Wyoming outside of the Black Hills). In contrast, CWD remains very rare in moose and has only been detected in one targeted moose in 2008, with over 1,120 moose tested to date. Prevalence estimates vary between herds, although deer herds generally exhibit significantly higher prevalence than sympatric elk herds (Table 1). In the majority of mule

deer herd units where statistically significant sample sizes have been obtained, prevalence has steadily increased since its initial discovery within that herd unit. However, in some southeastern Wyoming mule deer herds where the disease has long been established, CWD prevalence has either somewhat declined from peak levels and/or has remained relatively static, albeit at levels high enough to likely impact population performance. Overall, prevalence tends to be higher in southeastern Wyoming, where the disease has long been established but is quickly becoming more common and widespread in much of the state.

Figure 2. CWD distribution in Wyoming (2019).

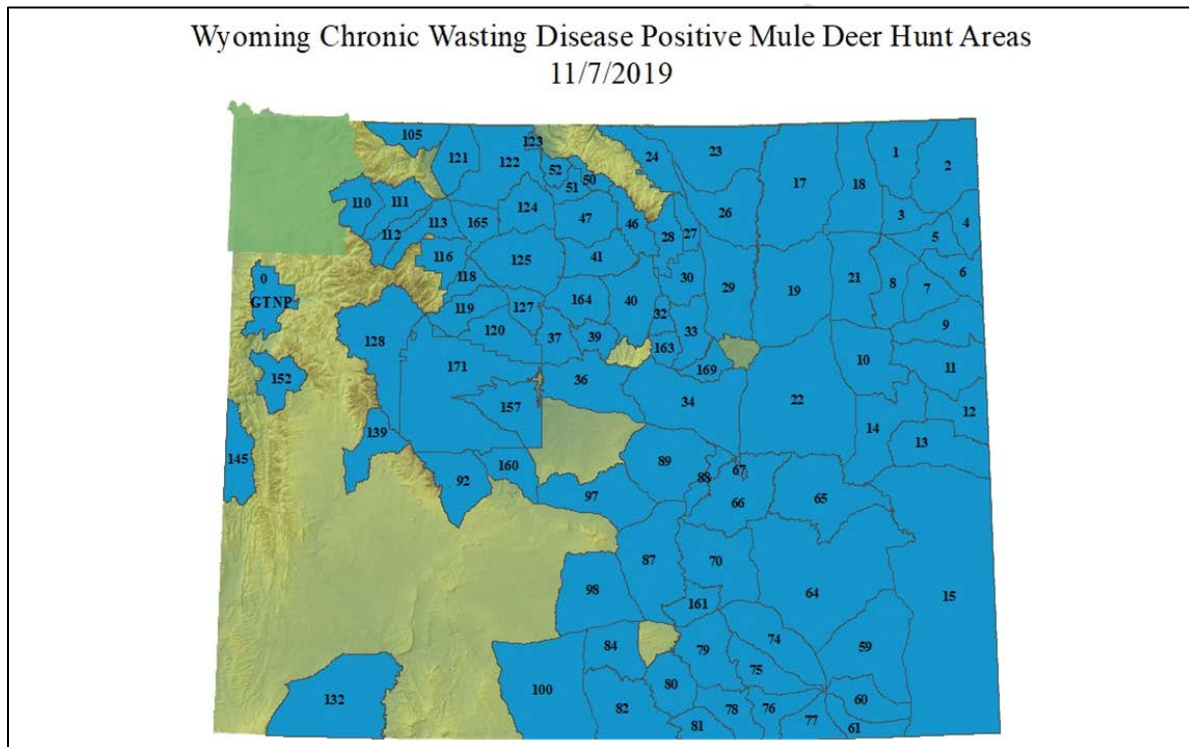


Table 1. CWD prevalence in sympatric Wyoming mule deer and elk herd units based on adult mule deer bucks and adult male and female elk (2016-2018).

Species and Herd Unit	Sample Size	Prevalence	95% C.I.
Mule Deer - Platte Valley	222	8%	4.2% - 12%
Mule Deer - Laramie Mountains	415	23%	15.6% - 27.7%
Mule Deer - Bates Hole/Hat Six	199	28%	16.9% - 34.9%
Mule Deer - South Converse	105	40%	21.1% - 48.2%
Elk - Snowy Range (compare to Platte Valley mule deer)	271	2%	0.6% - 4.3%
Elk - Laramie Peak / Muddy Mountain (compare to Laramie Mountains, Bates Hole / Hat Six & South Converse mule deer)	441	7%	4.5% - 9.8%
Elk - Iron Mountain (compare to Laramie Mountains mule deer)	168	14%	7.9% - 18.4%

Chronic Wasting Disease Outside of Wyoming

Chronic Wasting Disease has now been documented in captive and/or free-ranging cervids in 26 U.S. states, four Canadian provinces, Norway, Sweden, Finland, and South Korea. See the United States Geological Survey (USGS) National Wildlife Health Center website for a map of current CWD distribution in North America (<https://www.usgs.gov/media/images/distribution-chronic-wasting-disease-north-america-0>).

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Surveillance and Monitoring

The Department has conducted surveillance for CWD since 1997. Surveillance to detect CWD in new areas is conducted utilizing three primary sources for testing: hunter-harvested cervids, targeted cervids (animals exhibiting clinical signs of CWD), and road-killed cervids. Targeted and road-killed cervids have a greater likelihood of testing positive for CWD and are therefore valuable in detecting the disease in new areas, but are not used to estimate prevalence. Disease monitoring to estimate prevalence primarily utilizes hunter-harvested cervids.

Initially, surveillance focused on the detection of CWD in new areas of the state while monitoring disease prevalence occurred in southeastern Wyoming where it was first detected. The current broad and expanding distribution of this disease necessitates a shift in the surveillance program from detection of the disease on the leading edge of the known endemic area to monitoring its prevalence. Monitoring changes in CWD prevalence is important in understanding the potential impacts of the disease, as well as evaluating the efficacy of management actions.

To adequately monitor this disease while balancing the testing capacity of the Wildlife Health Laboratory (WHL), the Department will employ a rotating, five-year program that will focus surveillance in one or two herd units in each Department region of the state each year. Because CWD is a slow-moving disease with only gradual changes in prevalence, measuring prevalence every five years will provide adequate data to detect trends. Rotational surveillance will follow a set five-year schedule within each Department region, although scheduling will remain adaptive and flexible to meet changing surveillance needs (e.g., to gauge the efficacy of experimental management strategies), population objectives, as well as to incorporate current knowledge of disease epidemiology whenever possible.

Surveillance efforts for each deer and elk herd unit are based on the feasibility of collecting a minimum of 200 samples from adult male deer or adult elk within one to three years, as well as with consideration of additional Department priorities for monitoring and management actions. The success of sampling efforts is dependent upon a suite of factors including harvest strategy (i.e., general versus limited quota hunting, female harvest allowances, season length, etc.), the overall size of the herd unit, landownership patterns, hunter access, hunter participation in the surveillance program, likelihood of the harvested animal being field-checked, and other demands on Department personnel and resources. CWD sample collection in focal surveillance herd units is an expectation of all Department employees. Within some herd units, collecting 200 samples within a single year is feasible, while it may not be possible to collect even 100 samples over a three-year period in others. These factors are considered when formulating annual CWD surveillance plans within each Department region. It must be recognized that achieving sufficient sample sizes for valid prevalence estimates may not be feasible for all cervid herds in Wyoming. In addition, the Department may consider testing of road-killed animals to augment surveillance in areas where adequate sample sizes are difficult to obtain through hunter harvest. Estimates of prevalence from road-killed animals is interpreted with caution as CWD-positive animals are more likely to be hit by a vehicle given diminished behavioral awareness (Krumm et al. 2005).

Sample size requirements vary considerably depending on the overall goal of surveillance. When estimating prevalence, sample size requirements increase as prevalence increases in a herd unit. A sample size of 200 was selected as a uniform goal across the state, reflecting 90% – 96% confidence, given the known CWD prevalence of most herd units. However, when assessing

changes in prevalence over time (e.g., evaluating the effectiveness of management actions), sample size requirements increase when evaluating herds at lower prevalence, especially when attempting to measure small changes in prevalence. Details on sample size calculations based on statistical confidence are provided in Appendix A.

Chronic wasting disease prevalence in mule deer is based on adult males (≥ 2 years old), a standard metric that allows for comparisons of disease demographics across North American jurisdictions. The selection of males is based on monitoring data that demonstrates prevalence in adult males is significantly higher than adult females within the same herd. Moreover, infection is less common in yearlings, and relatively rare in fawns. In addition, because female mule deer harvest is limited in Wyoming, sampling hunter-harvested adult males provides larger sample sizes for assessment of long-term trends in prevalence. Although the focus is on adult males, assessment of yearling male and adult female prevalence is also monitored in those herds where harvest is sufficient to achieve meaningful sample sizes.

For CWD monitoring in white-tailed deer, prevalence can be measured in adult males for cross-jurisdictional comparisons, but can also be adequately measured in females in many areas in Wyoming due to liberal harvest strategies. However, white-tailed deer populations are not well defined at the herd unit level in Wyoming as they are a lower priority for population demographic data collection in most of the state. In elk, CWD prevalence is also measured in adults of both sexes due to the significant level of male and female harvest attained within many of Wyoming's elk herds.

Testing for Hunter-Harvested Cervids outside of Department Focal Herd Units

The Department recognizes some members of the public wish to have their deer, elk, or moose tested for CWD each year due to human health concerns. These concerns result in an influx of sampling from cervids harvested outside of focus surveillance areas for a given year. Despite WHL testing capacity considerations, the Department will continue to test unsolicited samples to the extent possible and will provide several sample collection options to accommodate this demand. Heads from harvested animals may be taken to any Department regional office during regular business hours for sampling, and they may be left if no personnel are immediately available. Also, the head or removed retropharyngeal lymph nodes may be submitted to the Wyoming State Veterinary Laboratory for a fee, with results being available within ten working days. Additionally, the Department will continue to provide sample collection training and educational opportunities to members of the public wishing to collect their own samples. Finally, samples may be collected in the field upon sportsperson request by Department personnel when feasible.

Wildlife Health Laboratory Testing Capacity

Testing capacity of the WHL is limited. While the WHL is an accredited laboratory, available space for CWD testing is restricted. With the utilization of other Departmental laboratories and purchase of additional required equipment, testing capacity has increased to 15,000 samples per year, although additional substantial infrastructure and personnel will be required to exceed that level of testing.

Establishing additional testing laboratories throughout the state may decrease shipping times while increasing testing capacity. However, this would require substantial additional resources and new

labs would need to conform to federal regulatory requirements. Because laboratories conducting CWD testing must be federally accredited and approved, the construction of additional facilities and necessary staffing requirements are prohibitively expensive.

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Disease Management Strategies

As the known distribution of CWD continues to expand, viable disease management strategies are needed for free-ranging cervid populations given eradication is not currently feasible (<https://www.usgs.gov/media/images/distribution-chronic-wasting-disease-north-america-0>). In 2018, the Western Association of Fish and Wildlife Agencies (WAFWA) published “*Recommendations for Adaptive Management of Chronic Wasting Disease in the West*” to facilitate the assessment of three CWD suppression strategies using an adaptive management framework in western states (WAFWA 2017). The three primary strategies include: 1) reduction of artificial points of host concentration; 2) hunter harvest management; and 3) harvest targeting disease foci, otherwise known as “hot spots”. Furthermore, WAFWA recommends using a Before-After-Control-Impact (BACI) design to determine what treatments most effectively influence CWD prevalence. The Department is well-suited to use a BACI design given a reasonable understanding of herd unit dynamics across the state.

Even though eradication is not feasible at this time, the Department will consider and evaluate management actions to slow the spread and/or reduce prevalence of the disease statewide while maintaining healthy and sustainable wildlife populations. Such management actions will be based on the best available scientific information and accepted wildlife management practices. The Department acknowledges some management strategies are experimental in nature, and may be met with controversy from the public. Nevertheless, it is incumbent upon wildlife managers to attempt to manage CWD prevalence and distribution for the long-term health and sustainability of cervid populations. Experimental management actions will be evaluated thoroughly (pre, post, and during implementation), and will enhance the national and international understanding of CWD management. To this end, the Department will pursue and implement CWD suppression strategies under an adaptive management framework. Many management strategies will require a BACI design for robust evaluation, while other strategies are more simplistic and may not require thorough analysis (i.e., fencing an individual haystack to reduce deer concentration). Management strategies will be determined at the local level and specifically tailored to each herd unit or localized sub-population, with consideration given to differences between migratory and non-migratory populations.

Management strategies designed to reduce CWD prevalence will emphasize hunter harvest management and reducing artificial cervid concentration. Implementation of management strategies outlined within this Plan is either ongoing, will begin immediately, or will necessitate long-term planning and public input prior to management action. Implementation timeframes will vary, although most management actions will need to be implemented over a long period of time (e.g., ten years or longer) to fully evaluate their efficacy. Intuitively, the greatest potential for successful CWD management action occurs in areas where prevalence is low and environmental transmission is likely playing a smaller role, even though CWD has the most significant population-level impacts where prevalence is high. Management of this disease is therefore recommended at all prevalence levels.

Artificial Sources of Cervid Concentration

High concentration of cervids may exacerbate CWD transmission via animal-to-animal contact and increased environmental contamination due to prion accumulation. Large concentrations of cervids are commonly observed on traditional deer and elk winter ranges given their natural life history and survival strategies. Artificial sources of cervid concentration occur in many urban and rural communities where private citizens intentionally feed wildlife, or there is an abundance of irrigated green space (i.e., parks, golf courses, etc.). Across Wyoming, the most common sources of unintended artificial cervid concentration stem from traditional agricultural practices. Throughout North America, agricultural operations play a vital role in the long-term health and sustainability of our wildlife populations by providing key habitat components such as food, water, and cover. As a result, cervid populations often congregate in unnaturally high densities around certain agricultural practices over long periods of time (i.e., mineral licks, water developments, haystacks, irrigated hayfields, etc.). Many of these practices are beneficial to wildlife in the absence of disease. However, given the increased distribution and prevalence of CWD, reducing wildlife concentrations at these points or features on the landscape may be prudent to minimize disease transmission. Finally, the Department recognizes the increased potential for disease transmission associated with elk feedgrounds, which will be addressed in a separate section of this Plan.

The Department will pursue the following actions to reduce artificial cervid concentrations to reduce CWD transmission potential:

- The Department will develop a recommendation to the Wyoming State Legislature to provide the Commission authority to regulate intentional feeding of wild cervids unless otherwise specified in law or authorized by the Department. Traditional agricultural practices will not be included in this recommendation.
- The Department will continue to work with local governments as needed to develop and implement ordinances on artificial feeding of cervids within their jurisdiction, unless otherwise specified in law or authorized by the Department.
- The Department will identify areas with unnaturally high concentrations of cervids with endemic CWD while also engaging the agricultural community to explore ways to minimize cervid concentrations without impacting traditional agricultural operations. At those points the Department will:
 - Work with landowners to decrease cervid concentrations through hunting seasons or culling.
 - Work with landowners to eliminate the source or to make the source unavailable to cervids (e.g., fencing/stackyards, salt/mineral feeders that exclude wildlife, etc.).
 - The Department will engage the agricultural community to develop recommended management practices and provide informational material to reduce cervid concentrations around irrigated hayfields, haystacks, water developments, mineral/salt licks, and other sources of cervid concentration.
- The Department will partner with the University of Wyoming, USGS, and individual landowners to assess cervid use around livestock salt/mineral supplement sites. Potential recommendations to reduce cervid use of salt/mineral sites may be developed following this assessment.

- The Department will assess the efficacy, need, value, and placement of water developments for wildlife (e.g., guzzlers) given the presence or threat of CWD.
- The Department will continue to implement habitat treatment projects across the state to benefit wildlife populations. Habitat treatments will be implemented as funding and permitting allows and in accordance with the Department's Strategic Habitat Plan (<https://wgfd.wyo.gov/Habitat/Habitat-Plans/Strategic-Habitat-Plan>). Prescriptive treatments in key habitats will promote healthier wildlife populations and can lead to improved distribution and nutritional condition of affected cervids. When conducted on a meaningful scale, habitat improvement projects may help buffer the impacts of disease and other factors affecting cervid populations.

Hunter Harvest Management

Prescribed hunter harvest (i.e., hunting seasons/license issuance) will be assessed to maximize the removal of positive animals to reduce CWD prevalence and transmission. The majority of the strategies outlined within this section emphasize harvest management in mule deer, but may also be applicable to white-tailed deer and elk. Moose densities are too low in Wyoming to utilize prescribed hunter harvest strategies as a viable CWD management tool, although targeted agency removal of suspected positive animals may be beneficial. Experimental hunter harvest strategies to reduce CWD prevalence and evaluate management efficacy will likely be most effective in mule deer populations for the following reasons: 1) Mule deer are the most widespread and commonly hunted cervid in Wyoming; 2) The evaluation of any experimental harvest management strategy will be most robust in mule deer given the Department's emphasis on mule deer demographic data collection and ability to detect population trend (as compared to white-tailed deer and elk); 3) CWD prevalence data sets are more robust in mule deer than in other cervid species due to sampling history and feasibility; and 4) In general, mule deer exhibit higher CWD prevalence than other Wyoming cervid species based on long-term surveillance data. The following excerpt comes from the 2017 WAFWA recommendations:

“Male deer appear to have a higher likelihood of CWD infection than females (Miller et al. 2000, Grear et al. 2006, DeVivo et al. 2015). Focusing harvest of sufficient intensity on the segment of the population most likely to be infected could help reduce disease prevalence and subsequent transmission (e.g., Potapov et al. 2016). Exploiting potential biases in removal of infected animals via harvest also could be used to enhance the efficacy of harvest as a control strategy (Wild et al. 2011). For example, targeting mature males via increased harvest pressure during or after the breeding season may selectively remove a higher proportion of infected individuals than harvest in early autumn (Conner et al. 2000). Such strategies would allow agencies to modify existing harvest management approaches to emphasize CWD suppression and thus should be relatively sustainable in the long-term with minimal additional personnel time or cost.

Alternatively, multiple CWD management programs have targeted winter culling around known CWD-infected animals because of spatial clustering of the disease on the landscape (e.g., Connor et al. 2007, Pybus 2012, Mateus-Pinilla et al. 2013). Data from these management attempts suggest effectiveness in limiting CWD (Pybus 2012, Mateus-Pinilla et al. 2013, Geremia et al. 2015). Due to the poor success in implementing long-term agency culling

programs, an alternative approach might be to use hunting seasons targeting specific winter ranges or disease foci.”

Where possible, a suite of experimental harvest management strategies will be considered to reduce CWD prevalence. Harvest management strategies will be determined at the local level and specifically tailored to each herd unit or localized sub-population, with consideration given to differences between migratory and non-migratory populations. Intensive public outreach efforts/involvement will be implemented when necessary to garner and maintain public support for the duration of the proposed action. Such outreach efforts may require local collaborative public input processes depending upon the significance of the proposed action. Harvest goals and resulting cervid densities (both male and female) from experimental harvest management strategies will be clearly articulated and developed with public input prior to and during implementation. Harvest management strategies will be implemented over a sufficient amount of time in conjunction with robust monitoring and surveillance (BACI design) to allow for rigorous evaluation of the efficacy of such actions.

The Department will pursue the following actions to reduce CWD prevalence using hunter harvest strategies:

- The Department will incorporate CWD management considerations in all cervid herd units when formulating annual and long-term herd management decisions (i.e., hunt season strategies, population size objective, and the male:female ratio management strategy/goal).
 - For all cervid herd units, CWD management considerations will be incorporated into annual herd unit Job Completion Reports (JCRs). The JCRs will include current prevalence estimates and corresponding sample size and distribution within the herd unit, as well as any potential CWD management strategies that may be implemented.
 - The WHL will provide preliminary CWD prevalence estimates and pertinent sampling information to Department regions by February 1 of each year. Final prevalence estimates will be updated annually for previous years.
 - Within JCRs, discussion regarding CWD for herd units with insufficient sample sizes to adequately estimate prevalence will acknowledge data limitations.
 - The Department will consider herd-specific CWD issues when reviewing herd unit management objectives.
 - The Department will evaluate the need to identify an alternative CWD-centric management objective for approval by the Commission whereby the sole management goal will be to attempt to decrease CWD prevalence and/or maintain it at a reduced level. Such an objective may be appropriate where a numeric postseason population size objective is inappropriate or unattainable due to high CWD prevalence. Numeric population size objectives are the preferred management objectives by the Department.
 - The Department will assess if CWD prevalence thresholds are appropriate to use as a trigger to require variable management considerations. Should prevalence thresholds be integrated into routine management recommendations, prevalence data used must be based on adequate sample size and distribution within a given herd unit.
- The Department will identify herd units, hunt areas, or subpopulations where appropriate to develop hunting season strategies to reduce or limit CWD prevalence. Within identified

herd units or areas, the Department will develop BACI-based experimental harvest management projects. These projects will vary in scope and duration depending upon issues within the herd unit, public support, and current CWD prevalence. Requisite outreach and education efforts will involve the public and maintain their support and involvement. The Department will consider the following hunting season strategies within herd units or areas identified:

- Increase mature male harvest to lower CWD prevalence and transmission. This may include altering season timing (earlier or later) and length or increasing license issuance.
 - Reduce populations to decrease densities within areas of concern (i.e., herd unit, hunt area, or subpopulation). Maintain reduced densities for a sufficient time, perhaps ten years or more, to adequately evaluate the effects on CWD prevalence. This will require some level of sustained female harvest.
- The Department will develop and implement lethal removal strategies to reduce cervid densities around disease foci locations, otherwise known as “hot spots.” Hunter harvest is preferred, although focused agency removal and other designated methods (e.g., sharpshooters) may be necessary.
 - The Department will continue to engage landowners to maintain or increase hunter access on both private and landlocked public/state lands. The Access Yes program and other hunter access programs will continue to be heavily utilized and will be tailored for specific management actions or harvest needs.
 - The Department will disseminate formal assessments of experimental hunter harvest management actions to bolster the broader understanding of their efficacy to reduce CWD.

Additional Regulatory and Agency Actions

Additional regulatory and agency actions regarding CWD are either ongoing or will be pursued. These include actions to address carcass disposal, captive cervid facilities, cervid translocation and importation, targeted removal, and interagency coordination.

The Department will pursue the following additional regulatory and agency actions to reduce CWD:

- The Department will continue to engage the Wyoming Department of Environmental Quality (WDEQ), the Wyoming Department of Transportation (WYDOT), the Wyoming County Commissioners Association, and relevant solid waste operators to facilitate proper disposal of cervid carcasses at approved landfills and/or transfer stations throughout Wyoming.
- The Department will continue to promote and enforce the Wyoming statutory prohibition of cervid ownership in Wyoming, and the Commission’s Chapter 10 regulation governing Importation, Possession, Confinement, Transportation, Sale, and Disposition of Live Wildlife. Wyoming has stringent laws and regulations pertaining to the private ownership and importation of live cervids. These laws and regulations were developed to protect Wyoming wildlife from threats associated with disease, genetic pollution, and other

ecological and environmental issues. The Chapter 10 Regulation addresses CWD in relation to the only privately owned elk facility permitted in Wyoming by statute. Any captive cervid imported into Wyoming must originate from facilities certified to be free of CWD in accordance with federal regulations (9 CFR, parts 55 and 81) and Commission regulation. Future establishment of captive, commercial native cervid facilities in Wyoming is prohibited by statute.

- Live free-ranging cervids originating within Wyoming will not be moved to other locations within or outside of Wyoming for any reason without prior review, approval, or permitting by the Department and/or Commission.
- Department personnel will continue with targeted removal of cervids exhibiting clinical signs of CWD. Targeted removal may remove sources of CWD on the landscape, as well as contribute to statewide surveillance data. In addition, tissue samples may provide research material to the Department or other researchers. When possible, Department personnel will collect appropriate biological samples (including whole carcasses for complete necropsy if necessary) for disease testing, and properly dispose of euthanized cervid remains to minimize CWD transmission and environmental contamination. Research has shown that such targeted surveillance / lethal removal is effective to document the presence of CWD in new areas as well as remove sources of infection (Miller et al. 2004).
- The Department will continue to enforce the Commission's Chapter 2 General Hunting regulation regarding the control of the importation, exportation, and transportation of harvested cervids and/or cervid parts taken both from within and outside of Wyoming.
- The Department will continue to collaborate with other state, federal, tribal, and international agencies as well as institutions of higher learning to exchange information regarding effective CWD suppression strategies both within and outside of Wyoming.
- The Department will continue to engage taxidermists and meat processors to provide information on relevant regulations and recommended practices regarding the handling and disposing of potentially infected cervid carcasses and parts.
- In accordance with a directive provided annually by the Department's Wildlife Division, all cervid carcasses donated by the Department will be tested for CWD regardless of carcass origin or how it came into the Department's possession. Any carcass testing positive for CWD shall not be donated and will be properly disposed of.
- The Department will continue to partner with the University of Wyoming to develop a statewide genetic database of cervid genotypes (for PrPc coding loci) for hunter-harvested and/or research cervids. This database will be used for future evaluations of potential genetic shift that may be attributed to endemic CWD. This database will also contain a whole cervid genome sequence that will provide information on biological structure of, and gene flow among, cervid populations. This genomic database will be important for assessing population-level effects of CWD and providing information for predictive models of future CWD spread and impacts.

- The Department will work with other applicable agencies and local governments to take the necessary steps to develop recommendations to the Wyoming State Legislature to authorize the use of existing funds to be allocated to solid waste operators to properly dispose of cervid remains to reduce prion presence at approved landfills.
- The Department will take the necessary steps to develop a recommendation to the Wyoming State Legislature to provide the Commission the authority to regulate the use of cervid urine.
- The Department will pursue funding for partnership programs to facilitate the proper disposal of cervid remains in communities across the state, with an emphasis on areas without approved landfills or transfer stations.
- The Department will use the current budgetary process and seek additional outside funding to maintain and increase CWD monitoring and WHL testing capacity as needed.

Voluntary and Mandatory Sample Submission for CWD Management Actions

Understanding the efficacy of any CWD management strategy is paramount for the future of CWD management. Wherever CWD-specific management strategies are implemented, details of prescribed management actions and CWD prevalence, both baseline and post-treatment, will be documented and thoroughly evaluated. To achieve this, Department personnel will utilize voluntary and/or mandatory CWD sample submission of hunter-harvested cervids to obtain statistically valid sample sizes to enable detection of any resulting changes in prevalence. Voluntary sample submission is preferred, although the Department may require mandatory sample submission in accordance with Commission Chapter 2 General Hunting regulation if necessary. Informing hunters prior to and during any mandatory CWD sample submission regime will be critical.

Elk Feedgrounds

Elk have been fed in northwest Wyoming since the early 1900s. Currently, there are 23 elk feedgrounds in Wyoming, with 22 operated by the Department and the National Elk Refuge (NER) operated by the United States Fish and Wildlife Service (USFWS). Supplemental feeding of elk during winter was initiated to mitigate for the loss of winter range, reduce human/elk conflict, and increase elk overwinter survival. While elk feedgrounds continue to address those issues, they now also facilitate spatial and temporal separation of elk and cattle to reduce the spread of brucellosis.

Supplemental winter feeding of elk creates complex biological, social, economic, and political issues. Wildlife disease adds to this complexity. Potential impacts from CWD on feedground elk populations are largely unknown, although it is possible that CWD prevalence within feedground elk may exceed that of unfed elk. In general, disease transmission can be correlated to the density of animals in a given area, as well as the frequency of contact between animals. It is assumed that if the disease becomes established, artificially concentrating elk on feedgrounds may result in more rapid spread of CWD and contribute to increased persistence of prions in the soil and uptake by vegetation (Pritzkow et al. 2015).

Due to the complex nature of elk feedgrounds and disease management, the Department is planning to initiate a localized collaborative process in Teton, Sublette, and Lincoln counties. This collaborative group is envisioned to serve in an advisory capacity to the Department on how to best manage CWD in relation to Department-operated elk feedgrounds. Although this process is more localized in nature, it shall include statewide interests with representation from the general public and other interested parties and agencies. This process will begin after the Commission has approved this Plan. This collaborative process will likely be tasked with the following: 1) review management plans, policies, and literature related to CWD and feedgrounds; 2) develop feedground-specific disease management plans that encompass not only CWD, but brucellosis, necrotic stomatitis, and other diseases; 3) conduct site-specific feedground evaluations; 4) address proper carcass disposal for suspected CWD-positive elk that die on or near feedgrounds; and 5) evaluate research and monitoring opportunities and needs.

Surveillance

In addition to focusing on the annual five-year rotational sampling program under the statewide surveillance plan, the Department conducts additional CWD surveillance work related to feedgrounds in the Pinedale and Jackson regions. In northwest Wyoming, considerable effort is put into monitoring for CWD. Road-kill, targeted, and hunter-harvested cervids are all tested, in addition to animals that perish on and near elk feedgrounds during the feeding season.

Grand Teton National Park (GTNP) and the National Elk Refuge (NER) have implemented mandatory CWD sampling requirements for hunter-harvested elk. This mandatory sample submission in the Jackson Elk Herd Unit provides sufficient samples to detect CWD occurring at 1% prevalence with 95% confidence. Chronic wasting disease has yet to be detected in the Jackson Elk Herd, although it has been detected in mule deer in Teton and Sublette counties.

Feeding Management Strategies for Disease Reduction

Disease reduction strategies were first implemented on elk feedgrounds during the winter of 2008 to decrease brucellosis prevalence in feedground elk by reducing disease transmission through systematic implementation of science-based management actions. Specifically, these strategies were designed to reduce disease transmission during feeding by employing low-density feeding to reduce elk densities on feedlines and shortening the supplemental feeding season to reduce the amount of time elk inhabit feedgrounds. These strategies are not always feasible on every feedground, and other factors must be considered prior to implementation, including the number of elk on feed, the size/topography of available feeding area, elk-cattle commingling risk, and the availability of native forage.

The Department will continue to utilize the following feeding management strategies:

- Low-density (LD) feeding is a technique designed to reduce intraspecific brucellosis transmission (i.e., elk-fetus contacts) by reducing elk densities on feedlines through providing multiple travel routes. Hay is dispersed along numerous rows in a checkerboard pattern, reducing elk densities while attending feedlines. LD feeding discourages elk from feeding along a single path of travel by allowing them to move in all directions from hay pile to hay pile, reducing the chances that an elk will contact an aborted fetus. When conducted consistently, reductions in brucellosis prevalence are expected over time. The utility of LD feeding to reduce or mitigate CWD transmission potential is unknown, although differences in environmental persistence between bacteria and prions should be considered.
- A reduction of the feeding season minimizes the time animals are in close proximity at a feeding location. This reduction in time animals spend in close proximity to each other likely reduces disease transmission among elk on feedgrounds.
- Where possible, elk feeders work to expand their feeding areas in order to feed on clean snow and new areas to increase the opportunity for elk to feed on areas with less biological contamination each day. This helps reduce the effects of environmental contamination of the feeding area.

These strategies are not always feasible on every feedground, and other factors must be considered prior to implementation, including the number of elk on feed, the size/topography of the available feeding area, elk-cattle commingling risk, and the availability of native forage before and after the feeding season. While these strategies were originally developed to mitigate brucellosis transmission risk, they may also be applicable in the management of other diseases including CWD and necrotic stomatitis.

Additional Ongoing and Interim Feedground Plan Requirements

Additional ongoing and interim feedground plan requirements and actions are already in place regarding disease surveillance and monitoring, habitat management, interagency coordination, research, and disease risk reduction.

The Department will continue to pursue the following regarding elk feedgrounds:

- The Department will identify, remove, and test all cervids exhibiting signs consistent with CWD on and around elk feedgrounds.
- The Department will continue general coordination with appropriate state and federal agencies regarding CWD issues in northwest Wyoming.
- The Department will continue to coordinate CWD surveillance and elk hunter harvest in northwestern Wyoming with the NER and GTNP. Additionally, the Department will coordinate with GTNP and the NER in the development and implementation of their CWD management plans.
- The Department will work with the NER, GTNP, and United States Forest Service (USFS) -Bridger-Teton National Forest (BTNF) on implementing the 2007 Jackson Elk and Bison Management Plan (www.fws.gov/bisonandelkplan/) to manage wintering populations and reduce their reliance on supplemental feed.
- The Department will collaborate with stakeholders to acquire critical winter range habitat and migration corridors where possible to protect elk from human disturbance.
- The Department will work with state and federal land management agencies and non-governmental organizations to develop, fund, and implement habitat improvement projects for elk to reduce dependence on feedgrounds.
- Based on research that grass plants can bind, retain, uptake, and transport prions (Pritzkow 2015), the potential prion transmission risk of contaminated hay harvested from the CWD endemic area being fed at state elk feedgrounds should be considered. Prior to hay being purchased and transported to elk feedgrounds, the Department will consider the spatial and temporal relationships between the location of potential source hay fields and the prevalence and distribution of CWD in cervids in these areas. Additionally, the Department will communicate with the appropriate land management agency(s) as it pertains to hay use and CWD at elk feedgrounds.
- The Department will review the Commission Supplemental Feeding of Elk/Wild Bison Policy to determine if changes are warranted to address CWD.
- The Department will determine if closures of specific feedgrounds can occur where dispersal of elk will not cause damage, conflict, or co-mingling issues with private property (i.e., stored crops, and domestic livestock) or create a need to drastically reduce overall elk numbers.

- The Department will consider CWD dynamics when developing herd unit population objectives, feedground quotas, hunting seasons, and other management recommendations. Documentation of CWD-related issues will occur in annual JCRs as deemed appropriate. The Department will strive to meet herd population objectives and feedground quotas by considering all contributing factors and influences.
- The Department will continue with intensive CWD surveillance and monitoring in the Jackson and Pinedale regions as WHL capacity and available resources allow.
- If CWD is detected in elk inhabiting feedgrounds, Department personnel will monitor the feedground and surrounding area intensively. Any elk exhibiting clinical signs of CWD shall be lethally removed, sampled, tested, and properly disposed of in a timely manner. Large-scale culling of elk on a feedground and on native winter range is not an anticipated action to address CWD.
- To the extent possible, the Department will continue to: 1) maximize the feeding area to decrease animal-to-animal contact (low-density feeding) and feed on clean snow; 2) decrease days of feeding to promote the dispersion of elk; and 3) take additional actions to decrease elk concentration provided such actions are consistent with other necessary wildlife management and feedground practices.
- The Department will utilize proper carcass disposal methods at feedgrounds to limit potential soil contamination and the spread of CWD; this may include incineration or other acceptable methods of disposal to minimize prion contamination.
- The Department will continue with and expand research and monitoring of cervid migration and dispersal routes in the Jackson and Pinedale regions, which will facilitate further understanding of underlying mechanisms behind the spread of CWD.
- The Department will continue to monitor predatory animal presence and their impacts on feedground elk, including the implementation of proper management actions for gray wolves that are causing unacceptable impacts to elk at any state-operated feedground in accordance with Wyoming Statute §23-1-304 and Commission Chapter 21 Gray Wolf Management regulation.
- The Department will continue to consider the potential role of predators and scavengers to remove CWD-infected animals and carcasses to reduce CWD transmission (Krumm 2010, Wild 2011).

Research and Coordination

Researchers and wildlife managers across the nation and abroad are working to better understand CWD and the underlying mechanisms of transmission, environmental and population persistence, and its ultimate influence on long-term cervid population dynamics. The development of CWD management strategies and requisite evaluations outlined within this plan signify the Department's contribution toward this important endeavor. Pertinent information resulting from any CWD management actions will be disseminated along appropriate channels both within and outside Wyoming. Conversely, any relevant information regarding successful CWD management strategies implemented outside of Wyoming will be thoughtfully considered by the Department for potential application. Finally, the Department will continue to partner with appropriate entities and pursue funding for meaningful CWD research to further the understanding of this disease in wildlife populations.

Depending upon the scope of the project, CWD research within free-ranging wildlife populations is typically very expensive due to the long timeframe required to study CWD dynamics as well as complexities associated with testing and following live animals. The Department is not a primary research agency and does not contain a research branch, therefore limiting its ability to conduct large-scale CWD research. Regardless, the Department will continue to request funding from the Commission for surveillance, research, and management to the extent possible, recognizing the myriad funding needs required for overall Department operations.

The Department will continue to collaborate with external entities (e.g., state, federal, tribal, and international agencies as well as institutions of higher education) on research priorities, projects, and funding to facilitate continued expansion of knowledge of CWD. The Department is committed to a long-term investment in research and “on the ground” management strategy implementation and evaluation. Finally, the Department will continue to monitor published research on CWD and contribute to relevant conferences, symposiums, and other collaborative forums to ensure the most current and comprehensive data and scientific information is considered in the formulation of CWD and cervid management decisions.

The Department has identified the following potential research priorities:

- Evaluate the effect and management implications of the hunter harvest strategies on CWD prevalence and transmission.
- Collaborate on research to evaluate the correlation between environmental prion contamination with disease prevalence and transmission.
- Assist in the validation of experimental assays for CWD prion detection (e.g., PMCA, RT-QuIC, and field testing).
- Continue to pursue collaborative research programs to better understand the role of cervid genetics in CWD dynamics and resulting potential management implications.
- Investigate the relative importance of direct versus indirect transmission of CWD prions.

- Initiate projects with willing landowners to evaluate acceptable techniques to reduce cervid concentrations around agricultural practices such as feed, mineral/salt, and water sites to reduce CWD transmission potential.
- Conduct research to determine if non-agriculture sources of artificial cervid concentration are increasing CWD prevalence (e.g., underpasses/overpasses, intentional artificial feeding, etc.).
- Pursue research to evaluate how cervid habitat selection may influence CWD prevalence and transmission. In addition, evaluate how prescriptive habitat improvements may affect cervid population demographics and distribution within herds with endemic CWD.
- Evaluate the effect and management implications of predators/large carnivores on CWD prevalence and transmission at a local level.
- Study the effects of inter-specific cervid competition on CWD prevalence.
- Evaluate regional differences in CWD dynamics.
- Continue to collaborate with the research and evaluation of CWD vaccines, although the Department acknowledges the development of an efficacious vaccine that can be administered within free-ranging cervid populations is unlikely at this time.

Internal CWD Management Team

The Department formed its internal CWD Management Team (CWDMT) in 2017, which is an extension of an existing internal ad hoc CWD committee. This team consists of representation from the Department's Veterinary Services Program, WHL, and Wildlife Division personnel from each Department region. To date, the roles and responsibilities of the CWDMT included internal communication within the agency regarding CWD issues and the implementation of the CWD collaborative process. Going forward, this team will meet regularly to assist in the development and evaluation of CWD management strategies, chronicle implemented management actions, review emerging research, consider lessons learned from actions implemented outside of Wyoming, and convey pertinent information to appropriate internal agency personnel and the public.

The Department's CWDMT will do the following:

- The CWDMT will assist regional efforts to identify, develop, implement, and evaluate CWD management strategies as needed.
- The CWDMT will chronicle management actions implemented within and outside of Wyoming to inform adaptive management strategies. Both successes and failures will be cataloged. Periodic summaries of CWD management actions will be made available for the public and Commission.
- As needed, the CWDMT will assist the WHL and Department regions in developing strategies for surveillance and monitoring throughout the state.
- The CWDMT will stay apprised of emerging research and pertinent information with respect to CWD and its management and will convey relevant information to the regions.
- The CWDMT will ensure necessary internal and external communications regarding CWD occur, including the implementation of the CWD Communication and Implementation Plan.

Human Health and CWD

The Wyoming Game and Fish Department is not a human health agency. The Department will continue to rely on the Centers for Disease Control and Prevention (CDC) and the Wyoming Department of Health for recommendations regarding potential human health risks associated with CWD. Currently, the CDC provides information on CWD and associated human health concerns at <https://www.cdc.gov/prions/cwd/index.html>. To date, there have been no documented cases of CWD in humans, and no direct proof humans can get CWD. However, public health officials recommend CWD-positive animals not be consumed.

The Department will continue the following:

- The Department will continue to work cooperatively with the WDH and other human health organizations to monitor current research and recommendations on CWD and human health to provide up-to-date information to the public.
- The Department will continue to test all cervids in the meat donation program. All deer, elk, and moose carcasses donated to the public by the Department shall be tested for CWD. Testing is a requirement regardless of how the Department came to possess the animal and whether the carcass came from a known CWD-positive hunt area. Any deer, elk, or moose in the Department's possession testing positive for CWD shall be disposed of in an approved landfill or incinerator. In situations where a deer, elk, or moose in the Department's possession cannot be tested for CWD due to an appropriate tissue sample not being obtained, the carcass or parts thereof shall not be donated for human consumption.
- The Department will work with the WDH and the Wyoming Department of Agriculture (WDA) to develop recommendations for the donation of game meat from cervids for meat donation programs outside of the Department, including food banks, urban deer removal programs, etc.

CWD Communication and Outreach

Chronic wasting disease is of significant interest to a wide variety of stakeholder groups at local, national, and international levels. As the agency charged with managing Wyoming's wildlife populations, the Department has an obligation to provide timely, complete, accurate, and unbiased information about CWD to the public. To date, the Department has conducted substantial information and education efforts regarding CWD, both within the agency and for the general public. However, additional outreach efforts will be required for the successful implementation of this Plan. The Department recognizes that extensive communication, outreach, and involvement is a critical step for garnering public support to implement meaningful CWD suppression strategies. Concerned constituents will be more likely to support long-term management actions if they have been thoroughly informed about and are involved with CWD-related issues including the necessity for action, the short- and long-term objectives of such actions, and how these actions may affect them, their hunting and recreational opportunities, and wildlife populations.

The Department will pursue the following to facilitate CWD communication and outreach:

- In conjunction with a recommendation stemming from the CWD Working Group, the Department will develop a comprehensive “CWD Communication and Implementation Plan” focusing on two stages of implementation.
 - Stage I will concentrate on CWD topics that need recurrent communication including but not limited to the following: 1) where CWD has been found in Wyoming; 2) public health information as determined by public health departments and experts; 3) disease monitoring efforts; 4) efforts to learn more about disease epidemiology; 5) potential impacts to deer, elk, or moose populations; 6) laws and regulations related to CWD; 7) carcass transportation and disposal; 8) artificial sources of cervid concentration and environmental contamination; and 9) how the public can help reduce the spread and prevalence of CWD during hunting seasons and throughout the year.
 - Stage II will focus on communication strategies regarding management actions, both experimental and long-term, and will occur on local and statewide levels.
- To assist in the development of the “CWD Communication and Implementation Plan,” results from the 2019 CWD Hunter Perspective Survey and those from public surveys conducted during the development of the Department’s Strategic Plan will be used to determine the best methods to deliver CWD messaging to the public.
- The Department will utilize all existing avenues to increase awareness of ongoing and emerging issues regarding CWD including how those issues are being addressed, and how the public and other stakeholders can further engage and participate.
- The Department’s annual “Job Completion Reports” will be used to chronicle current conditions and management data regarding CWD issues within all cervid herd units.
- The Department will continue to actively engage and involve the public in the management of cervid populations and CWD during annual season setting public meetings.

Wyoming CWD Management Plan – Public Input

The Department recognizes the need for increased public involvement and support to best manage CWD. To accomplish this, the Department engaged in an extensive public collaborative process to gather information, ideas, and opinions from the public. This process focused on the development of a stakeholder CWD Working Group and two rounds of public meetings in Laramie, Casper, Sheridan, Worland, and Pinedale. The Department also surveyed resident and nonresident deer hunters to gauge perspectives and understanding of CWD and its impact in Wyoming. During the collaborative process, input from the general public was also gathered via the Department's website. Finally, public comments on this revised Wyoming CWD Management Plan were solicited and accepted online, and were considered by the Department and Wyoming Game and Fish Commission (Commission) in the spring of 2020. Public participation was vital for all stages of the development of this Plan.

CWD Collaborative Process

In 2018, the Department began working with the Ruckelshaus Institute, Haub School of Environment and Natural Resources at the University of Wyoming to start planning a collaborative public process to engage key stakeholders and the public regarding CWD issues and concerns. This process enabled the Department to better develop this revised Plan to incorporate the best available science in addition to recommendations developed and supported through the collaborative public process.

As part of the collaborative public process, the Wyoming Game and Fish Director appointed the CWD Working Group through an application process. The CWD Working Group included 31 members representing local government, the Wyoming State Legislature, agriculture/landowner community, outfitting interests, federal agencies, state agencies, sportspersons, conservation non-governmental organizations, scientists, general public, and the Wyoming Game and Fish Department and Commission. Those who served on the CWD Working Group during this planning process are listed under the "Acknowledgements" section of this Plan. The Ruckelshaus Institute developed a charter outlining the purpose, roles, responsibilities, and decision-making process of this group. All public and CWD Working Group meeting agendas, presentations, recommendations, and the Wyoming Game and Fish Department Chronic Wasting Disease Collaborative Process Interim Report (Appendix B) can be found at <https://wgfd.wyo.gov/get-involved/cwd-working-group>. Recommendations from the CWD Working Group that were incorporated into this Plan are detailed in Appendix C.

The four phases of the collaborative process were as follows:

- Phase 1 – Input through Public Meetings: The first set of public meetings was conducted to elicit issues and management options related to CWD from the general public (including non-CWD Working Group citizens). Meetings were held in Laramie, Casper, Sheridan, Worland, and Pinedale. Attendees were presented with CWD information and were then divided into breakout groups to work with a facilitator to record ideas and suggestions on big game management with endemic CWD. There were 147 participants in these meetings across five locations. A total of 273 management options in 50 categorized themes were developed.

- **Phase 2 – CWD Working Group Meetings:** Following the public meetings, the CWD Working Group met on three different occasions. These meetings took place in July, August, and September of 2019. Information was provided by Wyoming Game and Fish personnel as well as from outside agency experts from Colorado and Wisconsin to ensure members were knowledgeable on topics and issues related to CWD. The information included an overview of the disease, epidemiology and transmission, impacts to big game populations, management of big game populations, and disease surveillance and monitoring. The CWD Working Group also learned about human health in relation to CWD from the Wyoming Department of Health (WDH). In these meetings, the CWD Working Group reviewed input from the public meetings and ultimately drafted recommendations for CWD management to the Department. There were nine recommendations and 43 sub-recommendations stemming from this process that the Department considered when revising this Plan.
- **Phase 3 – Reporting to the Public:** In December of 2019, the Ruckelshaus Institute facilitated the second series of five public meetings to present the CWD Working Group's recommendations and the Department's draft revised Plan. Meetings took place in the same communities as the initial series. The public again had the opportunity to interact with CWD Working Group members in attendance and provide feedback on all recommendations.
- **Phase 4 – CWD Working Group Final Input and Review:** In February 2020, the CWD Working Group convened to review the final results from the public meetings and assess whether their recommendations to the Department needed to be amended based on public input. Any modified or new recommendations were again tested for consensus with the CWD Working Group. Based on these final recommendations, the Department finalized the revised Plan and presented it to Commission in the spring of 2020 for adoption.

2019 Hunter Perspective Survey

From February through April of 2019, the Department surveyed both resident and nonresident deer hunters to garner insight on hunter perspectives regarding CWD in deer in Wyoming. Colorado Parks and Wildlife conducted a similar survey, and results from both states will be compared to provide a broader understanding of hunter perspectives on CWD. The purpose of this survey was to learn what resident and nonresident hunter interests are in relation to CWD, their potential concerns regarding this disease, and the ways the Department might effectively manage impacted deer herds in the state.

A sample of 3,000 deer hunters received the survey, including 2,000 resident and 1,000 nonresident hunters. Hunters were selected from respondents to the 2017 and 2018 Wyoming Game and Fish Department deer harvest survey. Both limited quota and general license holders who reported hunting in areas with known high (>10%) or low (\leq 5%) CWD prevalence were surveyed. Surveys were initially sent by email. A paper copy was sent via U.S. Postal Service if they did not respond to the email survey. A total of 1,201 hunters (622 from high prevalence hunt areas and 579 from low prevalence hunt areas; 751 residents and 450 nonresidents) responded to the survey.

Results from the survey were considered during the development of this revised Plan. In addition, hunter perspectives inform Department communication strategies by providing valuable insight into what information is most important to the hunting public. Similar future surveys may also be conducted to gauge shifts in hunter perspectives regarding CWD over time. A copy of the survey and a summary of responses to relevant questions can be found in Appendix D.

Key preliminary results from this survey were:

- A relative majority of hunters (48% high CWD prevalence [HCWD] group, 45% low CWD prevalence [LCWD] group) do not agree that concerns about CWD have been exaggerated, and a large majority (82% HCWD group, 78% LCWD group) agree that effort should be taken to reduce the rate of infection in deer.
- A majority of hunters are very concerned about the health of affected deer herds (59% HCWD group, 58% LCWD group), the potential for CWD to reduce deer hunting opportunity (61% HCWD group, 59% LCWD group), and future generation's ability to enjoy deer hunting (61% HCWD group, 58% LCWD group).
- Surveyed hunters were presented with three scenarios tailored to the high or low CWD prevalence of the original hunt area in which they hunted: one in which CWD prevalence stayed about the same; one in which CWD prevalence approximately doubled; and one in which CWD prevalence increased by approximately four to five times.
 - Under all three scenarios, a large majority (more than 80%) of hunters are likely to support taking measures to control CWD.
 - The proportion of hunters likely to look for alternative areas to hunt increased as theoretical CWD prevalence increased.
 - A majority of hunters indicated they are very unlikely to stop hunting for deer in Wyoming under all three scenarios.
- A majority of deer carcasses in Wyoming are either disposed of in the trash or landfill (28% HCWD group, 25% LCWD group), or edible meat was removed and the remaining carcass left in the field (34% HCWD group, 37% LCWD group).
- About 20% of hunters are unaware of carcass transportation regulations.
- About 65% of the HCWD group and 64% of the LCWD group reported harvesting a deer during the 2017 or 2018 hunting season. Of the HCWD group, 10% reported having ever harvested a CWD-positive deer versus <2% from the LCWD group.
- The most acceptable CWD control management action among hunters was the use of special management hunts to remove deer in localized areas of especially high prevalence with minimum impact on overall deer numbers. This was followed by using hunters to reduce the total deer population (bucks and does) and then by increasing the number of buck licenses available during later seasons in affected hunt areas.
- Taking no action and letting CWD take its natural course was the most unacceptable management action among a majority of hunters (74% HCWD group, 75% LCWD group).
- A majority of hunters indicate striking a balance between controlling CWD and preserving hunting opportunities should be a priority for the Department (82% HCWD group, 84% LCWD group).
- To receive information about CWD, hunters most preferred the Department's website followed by the hunting regulation brochure. The third most preferred source of information depended on the hunter's age. Those under age 50 preferred social media and those over age 50 preferred hunting magazines.

Literature Cited

- Bruce, M. E., Will, R. G., Ironside, J. W., McConnell, I., Drummond, D., Suttie, A., & Cousens, S. (1997). Transmissions to mice indicate that 'new variant' CJD is caused by the BSE agent. *Nature*, 389(6650), 498-501.
- Conner MM, McCarty CW, & Miller MW. (2000). Detection of bias in harvest-based estimates of chronic wasting disease prevalence in mule deer. *Journal of Wildlife Diseases* 36(4): 691–699.
- Conner MM, Miller MW, Ebinger MR, & Burnham KP. (2007). A Meta-BACI Approach for Evaluating Management Intervention on Chronic Wasting Disease in Mule Deer. *Ecological Applications* 17(1):140–153.
- DeVivo MT. (2015). Chronic Wasting Disease Ecology and Epidemiology of Mule Deer in Wyoming. University of Wyoming.
- DeVivo, M. T., Edmunds, D. R., Kauffman, M. J., Schumaker, B. A., Binfet, J., Kreeger, T. J., Richards, B. J., Schatzl, H. M., & Cornish, T. E. (2017). Endemic Chronic Wasting Disease Causes Mule Deer Population Decline in Wyoming. *PLoS ONE* 12(10): e0186512. <https://doi.org/10.1371/journal.pone.0186512>.
- Edmunds, D. R., Kauffman, M. J., Schumaker, B. A., Lindzey, F. G., Cook, W. E., Kreeger, T. J., Grogan, R. G., & Cornish T. E. (2016). Chronic Wasting Disease Drives Population Decline of White-Tailed Deer. *PloS ONE* 11(8): e0161127. doi:10.1371/ journal.pone.0161127.
- Forloni, G., Angeretti, N., Chiesa, R., Monzani, E., Salmona, M., Bugiani, O., & Tagliavini, F. (1993). Neurotoxicity of a Prion Protein Fragment. *Nature*, 362 543-546.
- Geremia C, Miller MW, Hoeting JA, Antolin MF, & Hobbs NT. (2015). Bayesian modeling of prion disease dynamics in mule deer using population monitoring and capture-recapture data. *PLoS ONE* 10(10):e0140687.
- Grear DA, Samuel MD, Langenberg JA, & Keane D. (2006). Demographic patterns and harvest vulnerability of chronic wasting disease infected white-tailed deer in Wisconsin. *Journal of Wildlife Management* 70:546–553.
- Gross, J. E., & Miller, M. W. (2001). Chronic wasting disease in mule deer: disease dynamics and control. *The Journal of wildlife management*, 205-215.
- Johnson, J. J., Pedersen, J. A., Chappell, R. J., McKenzie, D., & Aiken J. M. (2007). Oral Transmissibility of Prion Disease is Enhanced by Binding to Soil Particles. *PLoS Pathogens* 3(7):e93. Doi:10.1371/journal.ppat.0030093.
- Krumm, C. E., Conner, M. M., & Miller, M. W. (2005). Relative vulnerability of chronic wasting disease infected mule deer to vehicle collisions. *Journal of Wildlife Diseases*, 41(3), pp.503-511.

- Krumm, C. E., Conner, M. M., Hobbs, N. T., Hunter, D. O., & Miller, M. W. (2010). Mountain lions prey selectively on prion-infected mule deer. *Biology letters*, 6(2), 209-211.
- Mateus-Pinilla N, Weng HY, Ruiz MO, Shelton P, & Novakofski J. (2013). Evaluation of a wild white-tailed deer population management program for controlling chronic wasting disease in Illinois, 2003–2008. *Preventive Veterinary Medicine* 110(3):541–548.
- Miller, M. W., Williams, E. S., McCarty CW, Spraker TR, Kreeger TJ, Larsen CT, & Thorne ET. (2000). Epizootiology of chronic wasting disease in free-ranging cervids in Colorado and Wyoming. *Journal of Wildlife Diseases* 38:676–690.
- Miller, M. W., Williams, E. S., Hobbs, N. T., & Wolfe, L. L. (2004). Environmental sources of prion transmission in mule deer. *Emerging infectious diseases*, 10(6), 1003–1006. doi:10.3201/eid1006.040010
- Miller, M. W., Swanson, H. M., Wolfe, L. L., Quartarone, F. G., Huwer, S. L., Southwick, C. H., & Lukacs P.M. (2008). Lions and prions and deer demise. *PLoS one*, 3(12), e4019- e4019.
- Miller, M. W., Wolfe, L. L., Sirochman, T.M., Sirochman, M. A., Jewell, J. E., & Williams, E.S. (2012). Survival Patterns in White-Tailed and Mule Deer After Oral Inoculation With a Standardized Conspecific Prion Dose. *Journal of Wildlife Diseases*, 48(2), pp 526-529.
- Miller, M. W., & Fischer, J. R., (2016). The First Five (or more) Decades of Chronic Wasting Disease: Lessons for the Five Decades to Come. *Transactions of the North American Wildlife and Natural Resources Conference* 81: In press (Available online at http://cpw.state.co.us/Documents/Research/CWD/Miller-Fischer_CWDlessons.pdf).
- Monello, R. J., Powers, J. G., Hobbs, N. T., Spraker, T. R., O'Rourke, K. I., & Wild, M.A. (2013). Efficacy of antemortem rectal biopsies to diagnose and estimate prevalence of chronic wasting disease in free-ranging cow elk (*Cervus elaphus nelsoni*). *Journal of wildlife diseases*, 49(2), 270-278.
- Monello, R. J., Powers, J. G., Hobbs, N. T., Spraker, T. R., Watry, M. K., & Wild, M. A. (2014). Survival and population growth of a free-ranging elk population with a long history of exposure to chronic wasting disease. *The Journal of Wildlife Management*, 78(2), 214- 223.
- Monello, r. J., Galloway, N. L., Powers, J. G., Madsen-Bouterse, S. A., Edwards, W. H., Wood, M. E., O'Rourke, K. I., & Wild, M. A. (2017). Pathogen-Mediated Selection in Free-Ranging Elk Populations Infected by Chronic Wasting Disease. *Proceedings of the National Academy of Sciences* Nov 2017, 114 (46) 12208-12212; DOI: 10.1073/pnas.1707807114.
- Potapov A, Merrill E, Pybus M, & Lewis MA. (2016). Chronic wasting disease: Transmission mechanisms and the possibility of harvest management. *PLoS ONE* 11(3):e0151039.

- Pritzkow, S., Morales, R., Moda, F., Khan, U., Telling, G. C., Hoover, E., & Soto, C. (2015). Grass Plants Bind, Retain, Uptake, and Transport Infectious Prions. *Cell reports*, 11(8), 1168-1175.
- Pybus MJ. (2012). CWD Program Review 2012. Alberta Sustainable Resource Development, Fish and Wildlife Division. Web 17 March 2016. <http://aep.alberta.ca/fish-wildlife/wildlife-diseases/chronicwastingdisease/documents/CWD-ProgramReview-May-2012.pdf>
- Robinson, S. J., Samuel, M. D., Johnson, C. J., Adams, M., & McKenzie, D. I. (2012). Emerging prion disease drives host selection in a wildlife population. *Ecological Applications*, 22(3), 1050-1059.
- Walsh, D.P.,ed., 2012, Enhanced Surveillance Strategies for Detecting and Monitoring Chronic Wasting Disease in Free-Ranging Cervids: U.S. Geological Survey Open-File Report 2012–1036. 42 p.
- Western Association of Fish and Wildlife Agencies. 2017. Recommendations for Adaptive Management of Chronic Wasting Disease in the West. WAFWA Wildlife Health Committee and Mule Deer Working Group. Edmonton, Alberta, Canada and Fort Collins, Colorado, USA.
- Wild, M. A., Hobbs, N. T., Graham, M. S., & Miller, M. W. (2011). The role of predation in disease control: a comparison of selective and nonselective removal on prion disease dynamics in deer. *Journal of Wildlife Diseases*, 47(1), 78-93.
- Williams, E. S., & Young, S. (1980). Chronic wasting disease of captive mule deer: A spongiform encephalopathy 1. *Journal of wildlife diseases*, 16(1), 89-98.
- Uehlinger FD, Johnston AC, Bollinger TK & Waldner CL. (2016). Systematic review of management strategies to control chronic wasting disease in wild deer populations in North America. *BMC Veterinary Research* 12:173.

Appendix A – Measuring CWD Prevalence

The following statistical tables detail required sample sizes when measuring CWD prevalence within a herd unit (Table 1), as well as samples size requirements when evaluating the effectiveness of disease management strategies (Table 2). The point system used to survey areas where this disease has not been detected along with associated confidence levels is provided in Table 3. The Department strives for the highest level of statistical confidence that can be achieved given the constraints of sample collection with a given herd unit.

Table 1. Sample sizes required for assessing prevalence relative to estimated CWD prevalence in the herd unit and corresponding confidence level (based on 98% sensitivity and 99% specificity of the CWD ELISA).

Confidence	1% Prev	2% Prev	5% Prev	10% Prev	20% Prev	50% Prev
98%	556	821	1,584	2,748	4,670	7,188
96%	139	206	396	687	1,168	1,797
90%	23	33	64	110	187	288
80%	6	9	16	28	47	72
60%	2	3	4	7	12	18

Source: Humphry RW, Cameron A, Gunn GJ, 2004. A practical approach to calculate sample size for herd prevalence surveys. *Prev. Vet. Med.* 65: 173-188

When evaluating the effectiveness of management actions to control CWD within a herd unit, statistically valid sample sizes are dependent on the initial prevalence as well as the expected change resulting from the management action. Table 2 specifies sample sizes required to detect changes in prevalence following treatment (P1 vs. P2), assuming 95% confidence and 80% power. For example, if the starting CWD prevalence was 20% (P1) and management efforts were expected to reduce prevalence to 10% (P2), then approximately 199 samples would be required to document that change in prevalence with 95% confidence and 80% power.

Table 2. Sample sizes required to measure changes in CWD prevalence within a herd unit.

	P2 = 2.5%	P2 = 5%	P2 = 10%	P2 = 20%	P2 = 30%	P2 = 40%	P2 = 50%
P1 = 2.5%	NA	906	163	50	28	18	13
P1 = 5%	906	NA	435	76	36	22	15
P1 = 10%	163	435	NA	199	62	32	20
P1 = 20%	50	76	199	NA	294	82	39
P1 = 30%	28	36	62	294	NA	356	93
P1 = 40%	18	22	32	82	356	NA	388
P1 = 50%	13	15	20	39	93	388	NA

Sample sizes calculated using power.prop.test in Program R. Source: Recommendations for Adaptive Management of Chronic Wasting Disease in the West (WAFWA 2018).

In hunt areas where CWD has not been detected, a weighted surveillance program will be utilized. Weighted surveillance considers the sample source and type (e.g., road-killed female, hunter-killed

male, etc.) to determine an overall value toward surveillance (Table 3). These values are used toward a total point-goal, rather than a set sample size of hunter-harvested animals. Following calculations outlined by Walsh et al. (2012), 230 total points are required for 90% confidence and 300 points for 95% confidence in the detection of the disease occurring at 1% prevalence, assuming even distribution of disease on the landscape.

Table 3. Points for demographic categories of samples for mule deer and elk.

Sample Group	Weight/Points	
	Mule Deer	Elk
Targeted female	13.6	18.75
Targeted male	11.5	8.57
Road-kill (male or female)	1.9	0.41
Other Mortality	1.9	0.41
Harvested adult male	1	1.16
Harvested adult female	0.56	1
Harvested yearling male	0.33	0.23
Harvested yearling female	0.19	0.23
Harvested fawns or calves	0.001	0

Source: Walsh, D.P., ed., 2012, Enhanced surveillance strategies for detecting and monitoring chronic wasting disease in free-ranging cervids: U.S. Geological Survey Open-File Report 2012-1036. 42 p.

Because chronic wasting disease tends to occur in clusters on the landscape, best efforts to distribute surveillance evenly throughout the unit are employed. Road-kill and targeted samples tend to be clustered with roads and human access points, so hunter-harvested animals outside of these areas are included in the annual sampling effort. Robust sampling for detection will likely occur every five years when a regional focus on hunter samples will make a greater contribution to point totals. However, annual monitoring of road-killed, targeted, and opportunistic hunter-killed sampling allows for continued surveillance over time.

Wyoming Game and Fish Department Chronic Wasting Disease Collaborative Process Interim Report

OCTOBER 2019



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EXECUTIVE SUMMARY

In late 2018, the Ruckelshaus Institute of Environment and Natural Resources at the University of Wyoming entered an agreement with the Wyoming Game and Fish Department (WGFD) to facilitate a collaborative process to explore management options and seek consensus regarding strategies to reduce the prevalence of Chronic Wasting Disease (CWD) in Wyoming's ungulate populations.

The process approved by WGFD consists of four-phases:

1. Open meetings in five locations across Wyoming to solicit public input that explores the issues around CWD in Wyoming and management options for a Working Group to consider.
2. Convene a Working Group consisting of relevant stakeholder representatives to take the options suggested by the public, and test consensus around resulting draft recommendations to WGFD.
3. WGFD will draft an updated CWD Management Plan based on the Working Group's recommendations so far. Present this draft plan to the public in a second set of open public meetings in the same five locations as phase 1 to clarify the plan and seek additional public input.
4. Modify draft recommendations following second round of public input and test for consensus. Phase 4 will result in the final recommendations report from Working Group to WGFD leadership and to the Wyoming Game and Fish Commission.

This interim report serves to provide an update on WGFD's CWD collaborative process to date. The final complete report will be available in Spring 2020 once the Working Group has completed its process. This report provides an overview of the process and the recommendations that have been drafted by the Working Group thus far. Appendix A provides the agenda for the initial public meetings. Appendix B provides an overview of management recommendations developed in the public meetings. Appendix C provides the Working Group Charter. Appendix D provides agendas for the Working Group meetings. Appendix E presents the draft recommendations and level of consensus for each from the Working Group to WGFD.

1. INTRODUCTION

Chronic wasting disease (CWD) is a classic “wicked” situation: extremely contentious and extremely complex. The Wyoming Game and Fish Commission communicated its desire that the agency reduce the prevalence of CWD in Wyoming’s wildlife herds. However, the presence of CWD in Wyoming’s ungulate herds may require big changes (e.g., modifying harvest structures), which might conflict with public interests. Another contentious issue related to CWD centers around the role of feedgrounds in creating artificial concentrations of animals that can further the spread of CWD. Communicating with the public about these issues is essential to receive public support for long-term management strategies. Communication regarding CWD is likely to challenge assumptions: where previously the impact of CWD was not highlighted, new information may indicate otherwise. Additionally, there are big questions regarding this disease: At what scale should management actions take place? If actions are experimental and previously untried, how long should they be continued to gauge their effect appropriately?

Wyoming Game and Fish Department (WGFD) decided to address this complex issue by convening a statewide public process to explore ways to decrease the prevalence of CWD in Wyoming. The objectives of the collaborative process being led by the Ruckelshaus Institute are to:

- a) Collaboratively learn about CWD with the public and internally: how the disease manifests itself; effects on an individual animal, herds, populations; where the disease is prevalent; sources of environmental transmission; and many other aspects. In addition, explore not only what is known about CWD, but with what degree of certainty.
- b) Learn what options are available to address and decrease the disease in Wyoming wildlife populations.
- c) Provide information to the public regarding what is known about CWD, what management options are available, and anticipated consequences of possible management approaches.
- d) Provide WGFD leadership with recommendations that would have the best chance of reducing CWD in Wyoming.

2. PROCESS OVERVIEW

After deliberations with Wyoming Game and Fish Department's leadership and its internal CWD Management Team and presentation to the Wyoming Game and Fish Commission, the Ruckelshaus Institute initiated a four-phase process (Table 1). This process combines a series of public and Working Group meetings to learn about CWD, and craft recommendations for WGFD leadership. This process is based on the principles laid out in “Getting to Yes”¹ with the modified acronym PrHIOCTA:

- Identify the **P**roblems/issues
- Identify stakeholder **I**nterests
- Explore relevant **I**nformation (science, technology, regulatory frameworks, etc.)
- Draft management **O**ptions
- Weigh the options against **C**riteria (in this case the Interests)
- Explore **T**rade-offs related to the options
- Finally, test level of consensus and **A**greement.

All meetings in this process are convened by WGFD and facilitated by Dr. Jessica Western of the Ruckelshaus Institute. The four phases in this collaborative process include:

Phase 1 (May–June, 2019)

First set of meetings to share information and solicit public input on management options. Meetings were held in Laramie, WY (May 28); Casper, WY (May 29); Sheridan, WY (May 30); Worland, WY (June 3); and Pinedale, WY (June 4). See description below for more information.

Phase 2 (July–September, 2019)

First set of Working Group meetings to evaluate public input, make draft recommendations and explore levels of agreement (consensus). Two, two-day meetings took place in Lander, WY (July 23–25; September 10–12); and one in Casper, WY (August 20–22). See description below for more information.

Phase 3 (December 2019)

Second set of public meetings to review and discuss Working Group recommendations and WGFD’s draft CWD Management Plan. All meetings will be facilitated by the Ruckelshaus Institute per the following schedule:

¹ “Getting to Yes” (3rd edition) Roger Fisher, William Ury and Bruce Patton. 2011. Penguin New York, New York.

Pinedale
December 2, 2019
6:00 pm to 9:00 pm
The Pinedale Library,
Lovatt Room
155 S. Tyler Ave.
Pinedale, WY 82941

Laramie
December 10, 2019
6:00 pm to 9:00 pm
Laramie Game and Fish
Regional Office
1212 S. Adams
Laramie, WY 82070

Sheridan
December 12, 2019 6:00
pm to 9:00 pm Sheridan
Best Western, Snow Goose
Room
612 N. Main
Sheridan, WY 82801

Worland
December 3, 2019
6:00 pm to 9:00 pm
Worland Community
Center Complex
1200 Culbertson Avenue
Worland, WY 82401

Casper
December 11, 2019
6:00 pm to 9:00 pm
Casper Game and Fish
Regional Office
Pronghorn Room
3030 Energy Lane
Casper, WY 82604

Phase 4 (February–March, 2020)

Final Working Group meetings to review the results from the public meetings and assess whether recommendations to WGFD need to be amended. Any recommendations that are changed, eliminated, or added will be again tested for consensus. WGFD will use these recommendations to finalize the updated CWD Management Plan and present to leadership and to the Wyoming Game and Fish Commission in March 2020.

Figure 1. CWD Working Group Timeline

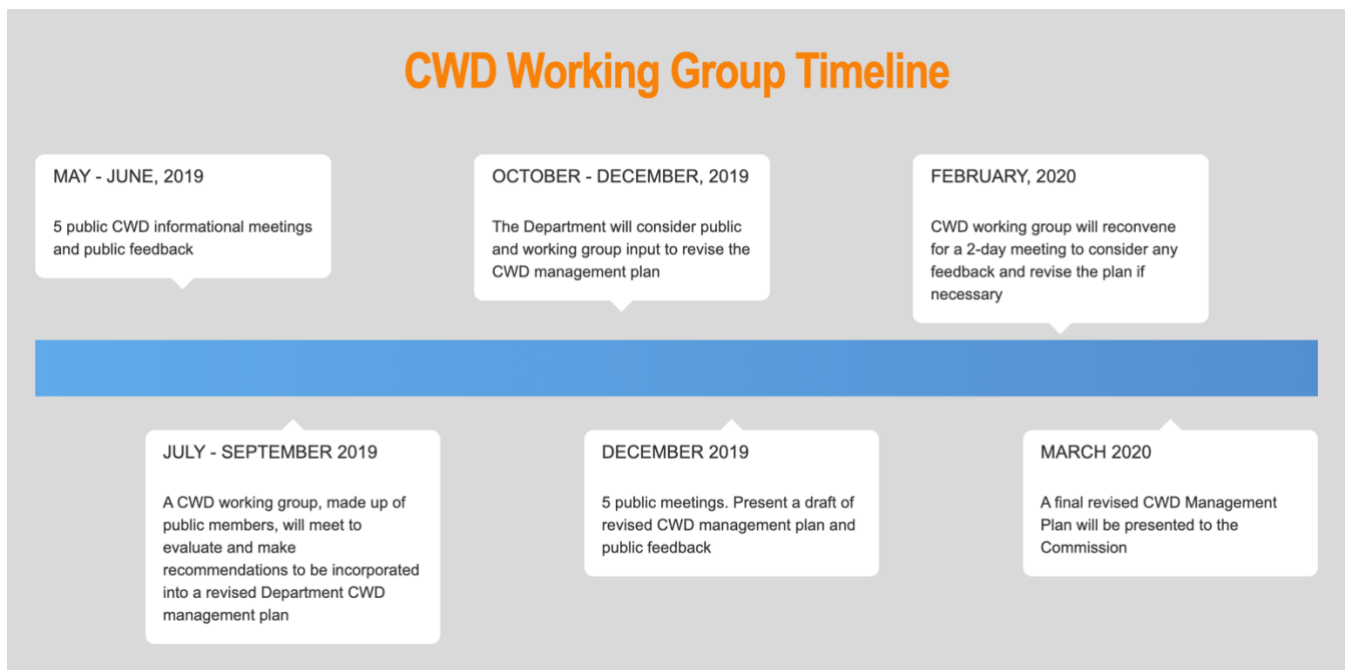


Table 1: Process Matrix outlining tasks in each PrIICTA phase for either the public or the Working Group.

WGFD Chronic Wasting Disease Collaboration Process Matrix				
PrIICTA phase	Public Involvement Task	Working Group Task	Result	Meeting Date
Problems – Phase 1	Identified problems		List of problems categorized by theme for Working Group.	May/June
Interests – Phase 2		Identified by Working Group	Articulate reasons why CWD is important.	July
Information – Phase 2.		Identified by Working Group	Identify the information needed to fully tackle CWD.	July
Options – Phase 1.	Identified management options		List of management options for WG to use to craft draft recommendations.	May/June
Criteria – Phase 2.		Use Working Group Interests to explore Trade-Offs.	Use Interests as the criteria against which draft recommendations will be evaluated.	July
Trade-offs – Phase 2.		Build Consensus around Draft Recommendations.	Evaluate the trade-offs related to draft recommendations.	August and September
Agreement – Phase 2		Test level of consensus for each draft recommendation.	Explore level of agreement for each recommendation.	August and September
Agreement – Phase 3 and 4	Public will review and provide comments on the draft Plan	Working Group reviews public comments and amends recommendations if necessary.	Final CWD Management Plan version 3.	Public December 2019; WG February 2020.



Figure 2: CWD Public Meeting in Laramie

3. DESCRIPTION AND OUTCOMES OF FIRST PUBLIC PROCESS MEETINGS: PROBLEMS AND OPTIONS

WGFD convened the first public meetings in May and June 2019 in Laramie, Casper, Sheridan, Worland, and Pinedale, facilitated by the Ruckelshaus Institute (see Appendix A for workshop agenda). The objectives of these meetings were to:

1. Introduce the Chronic Wasting Disease collaborative process and its purpose.
2. Provide information regarding the current knowledge regarding CWD.
3. Provide local information regarding CWD.
4. Provide the CWD Working Group with ideas to consider in developing management options for CWD.
5. Work in break-out groups to generate management options to reduce the prevalence of CWD.
6. Discuss next steps.

A total of 146 people attended the five workshops, representing interests ranging from agriculture, hunters, outfitters to local residents concerned with CWD. In each of the public meetings, members of WGFD provided information regarding CWD, after which participants were divided into break-out groups. Each group was asked to identify issues the Working Group should discuss and answer the question: *“What ideas would you like the CWD Working Group to consider in developing management options*

for CWD in Wyoming?” Responses were captured from the breakout groups on flipchart sheets and compiled into a spreadsheet. All workshop meetings concluded with open question and answer time.

This process yielded a total of 273 management options identified by the public, categorized into 50 themes (Appendix B).

4. DESCRIPTION OF WORKING GROUP PROCESS

A. STEERING COMMITTEE ROLE AND FORMATION

The initial steering committee consisted of several WGFD staff who are also on WGFD’s internal CWD Management Team, as well as the process facilitator, Jessica Western. Once the working group participants were selected and confirmed, the two co-chairs of the Working Group also joined the steering committee. The role of the steering committee is to contribute input on the formation and direction of the Working Group, provide support and feedback to the co-chairs and the Ruckelshaus Institute, and communicate with Director Nesvik as needed. The role of the co-chairs is to work together to lead the Working Group through meetings in order to reach a set of consensus recommendations. The co-chairs work with the Ruckelshaus Institute to provide input and direction at various points throughout the process, as well as to communicate with Director Nesvik when necessary. Co-chairs participate as full Working Group members, including communicating interests and voting on options.

B. SELECTION OF WORKING GROUP PARTICIPANTS

WGFD put out notices via a variety of media requesting applications for membership to the Working Group. The agency received 107 applications.

The steering committee used the following criteria to select the participants from the pool of applicants. The list of participants was then forwarded to WGFD for approval. Applicants needed to be able to meet all six criteria to the greatest extent possible:

1. Be willing and able to share information with/from the working group with the public as well as the organizations, groups, affiliations and businesses they represent.
2. Attend all working group meetings and participate in local CWD public meetings.
3. Have the ability and willingness to use scientific, social, economic and technical information in the deliberations and recommendation process.
4. Have the ability and willingness to negotiate in good faith during the working group process.
5. Applicants self-selected their stakeholder type at the time of application and are evaluated based on that selection.
6. Who can affect the outcome and who will be affected by the outcome?

C. CHARTER

The Charter was drafted by the Ruckelshaus Institute, reviewed and amended by the Steering Committee, and finally reviewed and amended by the Working Group. All participants present at the August 20, 2019, meeting conveyed their approval of the Charter with their signatures (Appendix C).

D. PROCESS

The final CWD Working Group selected by the steering committee consisted of 32 stakeholder representatives, and worked to craft recommendations over the course of three two-day meetings in July, August, and September 2019 (see Appendix D for meeting agendas). At the beginning of the first and second meeting the CWD Working Group spent considerable amount of time discussing CWD with scientists, and other states' CWD management plans with managers from Colorado, Montana and Wisconsin. In addition, WGFD provided more information on a number of subjects, for example how ungulates are currently managed in Wyoming.

The Working Group then took the options the public suggested at the May and June 2019 meetings to draft recommendations that will ultimately be used in the next WGFD CWD management plan (which will be Version 3). After discussing and compiling each recommendation and sub-recommendation, all recommendations and sub-recommendations were tested for consensus by the Working Group to explore the level of agreement with each one (Appendix E). WGFD intends to draft the next CWD Management Plan based on the Working Group's recommendations in October and November 2019.

The recommendations shared in this interim report are draft recommendations that may be further amended following the second set of workshops scheduled for December 2019. Following the December 2019 meetings, the Working Group will again test all recommendations for consensus before making final recommendations to Director Nesvik and WGFD leadership in February 2020.

Table 2: Participants in the CWD Working Group

First Name:	Last Name:	Affiliation	Working Group Role
Andrew	Pils	Federal Agency	Participant
Brant	Schumaker	Scientist	Participant
Bruce	Lawson	Sportsperson	Participant
Dave	Gustine	Federal Agency	Participant
Dax	McCarty	Outfitter	Participant
Garret	Falkenburg	Landowner or Agricultural Community	Participant
James	Wright	Federal Agency	Participant
Jeff	Daugherty	Conservation NGO	Participant
Jim	Logan	State Agency	Participant
Jim	Freeburn	General Public	Participant
Joe	Tilden	Local Government	Participant
Joshua	Coursey	Conservation NGO	Co-Chair
Justin	Caudill	State Agency	Participant
Karinthia	Harrison	General Public	Participant
Kent	Connelly	Local Government	Participant
Kristen	Gunther	Conservation NGO	Co-Chair
Laura	Meadows	Conservation NGO	Participant
Libby	Lankford	Landowner or Agricultural Community	Participant
Luke	Esch	State Agency	Participant
Lyle	Lamb	State Agency	Participant
Mike	Schmid	Wyoming Game and Fish Commission	Participant
Millie	Copper	Sportsperson	Participant
Nick	Dobric	Conservation NGO	Participant
Richard	Pallister	Sportsperson	Participant
Shane	Moore	General Public	Participant
Steve	Martin	Sportsperson	Participant
Sy	Gilliland	Outfitter	Participant
Tony	Lehner	Local Government	Participant
Martin	Hicks	WGFD	Participant
Dan	Smith	WGFD	Participant
Larry	Hicks	Wyo. State Legislature	Participant
Janet	Marschner	Sportsperson	Participant

5. RESULTS WORKING GROUP PROCESS: INTERESTS AND RECOMMENDATIONS

A. INTERESTS

The Working Group first convened in July 2019. As part of the PrHIOCTA process, the Working Group developed an interests statement outlining the reasons why finding options to reduce the prevalence of CWD in Wyoming was important. The Ruckelshaus Institute compiled a list of draft interest statements which were later shared with the group. These interests will be used later in the process to evaluate the final recommendations put forth by the Working Group in February 2020:

1. Healthy wildlife is important to our State economically, for example in relation to tourism, wildlife watching, outfitting, hunting and fishing, and agriculture.
2. CWD could have cascading ecosystem effects on our landscapes and result in loss of wildlife.
3. CWD could threaten numbers of hunters important to maintain the conservation ethic, and causes great suffering to animals.
4. This disease could reduce the potential for hunting for future generations.
5. CWD may be a health threat to humans and livestock and requires careful disposal of cervid carcasses and parts to reduce the probability, and rate, of transmission.
6. CWD is an issue that has the potential to affect hunting management in a way that could decrease my hunting opportunities.
7. CWD has the potential to decrease the sustainability of Wyoming's cervid herds.

B. RECOMMENDATION FORMULATION

Using the options recommended in the public meetings (Appendix B), the group worked together to develop draft recommendation and sub-recommendation language. All the language was created by the Working Group, after which it was evaluated to ensure the recommendations met as many interests as possible. To explore the extent to which recommendations met those interests, the group went through the process of testing for consensus.

The group tested each recommendation and sub-recommendations using the five-finger approach, whereby participants used the following numbers to indicate their level of agreement with each recommendation and sub-recommendation:

1. Endorsement – member likes it
2. Endorsement with minor point of contention – Basically, member likes it
3. Agreement with minor reservations – Member does not oppose
4. Stand aside with major reservations – Formal disagreement, but will not block the proposal/provision
5. Block – Member will not support the proposal

Consensus means that, at a minimum, all participants assigned the recommendation with a 1, 2, or 3. If a participant rated a recommendation with a 4, then the recommendation is still consensus, but with major reservations. If a participant rated a recommendation with a 5, then it will be listed under “No Consensus.” Thus, recommendations with lower scores will have received more agreement from the group, whereas recommendations with higher scores will have received less agreement.

Below is a list of the recommendations that emerged from the Working Group discussions. The recommendations are organized by level of consensus (that is, full consensus, consensus with major reservations, or no consensus). Consensus scores for each recommendations are listed in Appendix E.

Note: regarding recommendation 5.2: the original language addressed “experimental strategies to significantly increase harvest beyond established management guidelines and evaluate the efficacy of such actions over the long term”. This sub-recommendation required a considerable amount of work for the Group. The Working Group decided to formulate all possible options and test them for consensus for the public and WGFD to consider. The result was six options for 5.2, each receiving a different level of consensus.

C. CONSENSUS RECOMMENDATIONS AND SUB-RECOMMENDATIONS

Regarding Recommendation 1: Artificial Concentrations

- 1.1 We recommend the WY Legislature provide the WGF Commission the authority to regulate the intentional private feeding of wild cervids, unless otherwise specified in law or authorized by the WGFD
- 1.2 We recommend WGFD collaborate at a local level to reduce artificial points of cervid concentrations where possible
- 1.3 WGFD should work closely with local constituencies to eliminate artificial feeding and reduce density of cervids, unless otherwise specified in law or authorized by the WGFD
- 1.4 WGFD will work collaboratively with public stakeholder working groups to evaluate feeding practices of elk at feed grounds where possible to reduce risk and minimize negative impacts on elk population

RECOMMENDATION 2: CERVID REMAINS

We recommend a multi-prong approach to addressing the proper disposal of cervid remains and carcasses.

- 2.1 We recommend WGFD works with individuals/NGOs/businesses to facilitate proper disposal of cervid remains/carcasses through funding partnerships (e.g. through Adopt A Dumpster Program).
- 2.2 We recommend WGFD work with DEQ, local solid waste operators and WY DOT to properly dispose of carcasses statewide and provide information about proper disposal sites.
- 2.3 We recommend the WY legislature provide authorization for use of existing funds to be used by local solid waste operators to properly dispose of cervid remains to reduce CWD prion prevalence
- 2.4 We recommend the WY Legislature provides statutory authority to the WGF Commission to regulate the use of cervid urine

RECOMMENDATION 3: EDUCATION AND COMMUNICATION

- 3.1 We recommend WGFD create a thoroughly articulated and deliberate CWD communication plan. The first priority of this communication plan is to build public support to be able to implement the recommendations from the CWD Plan. This plan should target all stakeholders to include, but not limited to: general public, hunters, hunter education, travel & tourism (chambers), meat processors, taxidermists, outfitters, landowners, state & federal agencies, tribal, and elected officials. The communication plan should address all CWD related issues including: transportation (interstate and intrastate) & disposal of carcasses (e.g. Quarter & Go), CWD pathology basics, artificial point sources, transmission, potential management strategies,

importance of testing, human health, surveillance, up to date science, not feeding wildlife and the implication feeding has with spreading CWD and the essential role of hunting in disease management, unknowns, etc. Pursue this outreach plan with local organizations and NGOs. This communication plan needs to be very carefully thought through in order to avoid misperceptions. Involve all working group members. WGFD will create materials that are easily usable by other entities and organizations.

RECOMMENDATION 4: HABITATS AND CWD:

Combine habitat management and research to support cervid health.

4.1 Incorporate CWD consideration in WGFD's Strategic Habitat Plan to improve habitat and promote better distribution of cervids

RECOMMENDATION 5: CERVID AND CWD MANAGEMENT ACTIONS

We recommend the Department consider experimental application of CWD suppression strategies utilizing an adaptive management framework with consideration to the WAFWA's "Recommendations for Adaptive Management of CWD in the West" document. Management strategies should be implemented for a minimum of 10 years with a robust monitoring program to estimate prevalence with statistically significant sample sizes at least every 5 years. This would support a regional effort to gather valuable data to contribute to broader understanding of CWD suppression strategies. All management recommendations generated by this working group should be considered for experimental application and evaluation under this framework.

5.2 Option 3: Alter the timing of buck harvest in order to increase harvest of mature bucks. E.g. taking advantage of seasonal behaviors

5.2 Option 4: Reduce cervid populations to measurably decrease densities within an area of concern (e.g. herd unit, hunt area, portion of a hunt area). Maintain reduced densities for the appropriate amount of time to adequately evaluate effects on CWD (i.e. greater than 10 years). This may require a sustained increase in female harvest. Density and harvest goals must be clearly articulated and developed with public input prior to and during implementation.

5.2 Option 6: Utilize a robust monitoring program to identify areas with a high density of CWD positive cervids (i.e. "hot spots"). Develop and implement lethal removal strategies to maximize removal of cervids (male and female) around locations of known "hot spots", including but not limited to hunter harvest (preferred), targeted agency removal, and other designated methods

5.3 Encourage a multifaceted approach to use experimental design or management strategies to reduce CWD prevalence. Acknowledge relative study time frames and need for continually engaging the public to gain informed support.

5.4 WGFD will consider CWD in the adjustment of harvest and population objectives and associated management strategies to manage cervid numbers (male & female) in areas of concern

5.5 Utilize a combination of voluntary and mandatory testing in areas where specific CWD management is being applied in order to obtain statistically valid sample sizes to evaluate the efficacy of any such management strategy.

5.6 Develop an adaptive monitoring plan based on prescribed management for a time frame of 10 years (to be assessed at 5 year intervals) for all cervids.

5.8 We recommend WGFD cooperate with landowners to increase hunter access for CWD management.

RECOMMENDATION 6: CWD AND MIGRATORY HERDS

We recommend that management actions are implemented in migratory cervid herds to reduce disease transmission risk and keep CWD prevalence at low or reduced levels.

- 6.1 Support systematic monitoring across the state to detect “hot spots” and CWD prevalence information
- 6.2 Consider issuing licenses and associated hunting seasons in relation to migratory herds that are intended to specifically address CWD management actions.
- 6.3 Consider issuing licenses and associated hunting seasons in relation to migratory herds that are intended to specifically address CWD management actions.

RECOMMENDATION 7: SURVEILLANCE & MONITORING

Support surveillance efforts necessary to detect changes in CWD prevalence. Use sample sizes collected over a maximum of a 3-year time frame as per the WGFD-CWD Surveillance Plan.

- 7.1 Utilize various licensing options to increase sample size in hunt areas where statistically significant sample sizes are needed (i.e. increased reduced price license/female harvest, late season, etc.).
- 7.2 WGFD to create non-monetary incentives to increase CWD sample sizes where needed.
- 7.3 Analyze & mine data for population and disease demographic information including male:female ratio, gender specific disease prevalence, survival rates, pre and post management.
- 7.4 Pursue increased funding to support testing, monitoring and additional laboratory capacity.

RECOMMENDATION 8: RESEARCH

We recommend the WGFD enhance its CWD research and testing capacity by diverse means to enable science-based cervid management.

- 8.1 Continue to rigorously pursue collaborative genetic research programs with state and federal agencies, universities and private entities to better understand the role genetics plays in CWD in cervid populations and potential management implications. This should include, but not be

limited to: monitoring frequency of genotypes in cervid populations and the fitness traits associated with these genotypes

8.3 Investigate the relative importance of direct vs. indirect transmission of CWD prions

8.4 Assist in the validation of experimental assays for CWD prion detection (e.g. PMCA, rt-quic, and field testing).

8.5 Evaluate regional differences in CWD dynamics

8.6 Pursue funding for collaborative CWD research and management efforts. Explore funding sources including but not limited to: private, non-profits, general state funds, grants, federal sources, CWD management stamp, non-consumptive users, WY Governor's Big Game License Coalition, Commissioner's license.

8.8 Incorporate CWD data collection into current and future research where appropriate

8.10 Begin a research project at feed, mineral, water, and salt sites working with willing landowners to explore techniques to reduce CWD transmission.

8.11 We recommend WGFD collaborate on research on how environmental prion contamination correlates with disease prevalence and transmission.

8.13 Pursue habitat research on CWD to include: 1) How cervid habitat selection affects CWD prevalence, 2) How habitat improvements affect population demographics and distribution in the face of CWD

8.14 We recommend WGFD continue to collaborate nationally and internationally regarding CWD strategies and management actions and associated outcomes and research - in order to adaptively manage CWD.

RECOMMENDATION 9: MEAT PROCESSING

9.1 Recommend the WY Dept. of Health and WY Dept. Agriculture work with pertinent stakeholder groups to develop recommendations for meat processors.

9.2 Recommend the WY Dept. of Health and WY Dept. Agriculture work with pertinent stakeholder groups to develop recommendations for safe donation of game meat.



Figure 3: Working Group testing for consensus September 2019 in Lander

D. CONSENSUS RECOMMENDATIONS AND SUB-RECOMMENDATIONS WITH MAJOR RESERVATIONS

In this section the seven recommendations and sub-recommendations are listed that received consensus with major reservations. The reservations of each participant are listed below the related recommendation.

RECOMMENDATION 1: REDUCTION OF ARTIFICIAL CONCENTRATIONS

We recommend WGFD takes action to reduce artificial points of concentrations

Garrett Falkenburg: “Overall language in one of the last draft final recommendation language, the wording gives examples of artificial points of concentration. There are a lot of them and so therefore it would disqualify a lot of agricultural operations, and it would take them away from their ranching and farming work. The wording says "WGFD take action to reduce" is way too harsh for me. It sounds like they {WGFD} are going to force their way onto private lands.”

3.2 We recommend WGFD explore hiring a third party communications contractor to help implement the outreach plan

Justin Caudill: “I would support the WGFD management in using outside parties to assist in the implementation of the CWD plan, if they so choose to go this direction. But as an employee of another state agency I do not believe it is my nor the CWD working groups’ role to recommend the evaluation and or hiring of outside parties to assist G&F in implementing their outreach plan”.

Josh Coursey: “I do not believe that a 3rd party is fiscally responsible and carrying this message forward to the public. WGFD is the experts on this and the leader of its messaging and should own this. Members of this working group can assist in getting this message out there but the allocations of dollars to this effort is irresponsible in my opinion and in poor judgement. Those dollars could be used elsewhere where they could be more beneficial in education/awareness or on the ground where they can make an impact.”

5.2: Specific management decisions should be determined at the local level and tailored to the population unit. Ensure education and outreach in order to gain and maintain public support for the CWD management actions. The following management recommendations are supported by this working group and should be considered either alone or in combination

Garrett Falkenburg: “I have problem with the last sentence saying, "recommendations are supported by this working group". By looking down through the different options below, one can see that is not the case. My recommendation would be to change the wording or delete the last sentence.”

Larry Hicks: “Overall language ‘The following management recommendations are supported by this working group and should be considered either alone or in combination.’ I do not agree that all of the management decision should be considered.”

5.2 Option 4: Where possible, reduce areas of artificial concentration of cervids (feed, mineral, salt, water etc.) by working with landowners, producers, local, state and federal agencies.

Garrett Falkenburg: “This option reads an awful lot like 1.4 general language. It even expands to include my salt and mineral. Both are very, very important to ag. It’s sad that there are is way to actually confirm or deny that ingredients in my mineral have anything to do with CWD.”

Sy Gilliland: “This option is seems to point a finger at AG operations. This is a wildlife disease and the solutions haven’t been scientifically proven. In a scientific setting we have to identify and prove the transmission causes. Then try to figure out options that can be worked through with full cooperation with the AG community. If we start down this road without solid science then we could be causing hardship on AG and our feedgrounds.”

8.2 We recommend WGFD pursue research (e.g. a survey) to determine public attitudes on CWD

Larry Hicks: “Time and money are limited commodities and just surveying “the public” which the vast majority do not know or care about CWD is waste of both time and money.”

Josh Coursey: “A survey to gauge the awareness or support of CWD and its related content from whatever demographic is also fiscally irresponsible. We know from past work that many are unaware of CWD and its magnitude of impact. Let’s use these resources to move forward a well designed PR campaign that is informative and encourages folks to be engaged to the issue and solicits their support to help further the messaging to reach and educate more.”

8.15 We recommend WGFD collaborate in research and evaluation of a CWD vaccine

Laura Meadows: “To date, no vaccine has ever been developed for a transmissible spongiform encephalopathy, including Scrapie which is economically important worldwide and has been identified for over 200 years. Creating a vaccine for a transmissible spongiform encephalopathy would, at the very least, be extremely difficult as the agent is a protein identical to host proteins at the binding site level. The likelihood of developing such a vaccine is very low. Resources, both funding and personnel, could be better spent on achievable population management objectives.”

Brant Schumaker: “To date, no vaccine has ever been developed for a transmissible spongiform encephalopathy like CWD. Creating a vaccine for a transmissible spongiform encephalopathy would, at the very least, be extremely difficult as the agent is a protein identical to host proteins. The concept of a CWD vaccine is that the misfolding of the prion may induce a conformational change that could expose a unique epitope that may allow antibodies to be developed to the

misfolded prion protein. To date, challenge studies with this vaccine have actually accelerated the development of clinical CWD. While it is interesting to consider the idea of vaccinating our way out of CWD, the likelihood of developing such a vaccine is, in my educated opinion, a low probability and funding could be better spent on achievable population management objectives.”

8.16 Study the effects of competition among cervid species on CWD prevalence

Larry Hicks: “The group massages this statement when in fact the whole concept was to kill elk to save deer. They used CWD as a surrogate to push a for-gone conclusion that elk are the problem. I can’t speak for everywhere but so far we have not been able to document that elk eat mule deer in my part of the state. There are higher priority research needs! Lets start with trying to understand transmission how and when that occurs as well as the source of the prions.”

E. RECOMMENDATIONS AND SUB-RECOMMENDATIONS WITH NO CONSENSUS

The following is the list of seven recommendations and sub-recommendations that did not receive full consensus, with the reasons for no consensus rating from related participants.

1.4 WGFD will work collaboratively with public stakeholder working groups to evaluate feeding practices of elk at feed grounds where possible to reduce risk and minimize negative impacts on elk population.

Garrett Falkenburg: “Agriculture in the state of Wyoming has no interest to abolish feed grounds. First, they keep the forage damage on private lands to a minimum. Second, it helps keep haystack damage to a minimum. Third, it helps keep elk from raiding feed lines put out for cattle. 4th While elk and cattle comeingle on feedlines is when diseases such as brucellosis are transmitted. Wyoming Ag cannot lose our brucellosis free status furthermore I do not believe that the wildlife viewing public has any interest in seeing starving elk, nor does the elk hunting sportsman want to give up sport hunting opportunities because of herd reduction.”

Justin Caudill: “My issue with this recommendation is that WGFD should utilize the best science to drive any evaluations of feeding practices associated with feed grounds. Questions and data needs can be defined through local work groups/stakeholders, but decisions should be determined by WGFD using the best available science related to elk populations and their needs.”

Kent Connolly: “Elk feed grounds are going to be looked at by a working group from what G and F says, us recommending anything will diminish that effort and most likely be in conflict and make the issue worse. Stop any feed ground and you’re just taking it from a high-profile area and killing them or moving the issue to any area that will create competition for mule deer AKA Sage junction and the Cokeville area in Lincoln County. Mother nature and people dictate the need for feed grounds. The sportsman regularly step-in and feed in the impacted areas of the west and will not let them starve to death. The City feeding will become your new feed ground in certain areas, Jackson's streets will look like some Colorado's cities.”

Larry Hicks: “I do not believe this has to be done by collaborative public stake holder groups. This is a recipe for the anti-feed ground groups to leverage their position and push an agenda and use CWD as a surrogate to accomplish what they have advocated for a long time. The WGFD is more than capable of conducting monitoring and adjusting management as need without providing the anti-feed ground folks a platform to advocate from.”

5.1 Research suggests the greatest potential for successful CWD management actions occurs when prevalence is low. Therefore, CWD management is recommended at all prevalence levels, but local options to implement more aggressive management should be pursued once statistically valid prevalence reaches/exceeds 5%.

Larry Hicks: “Most problematic of all the recommendation. First it states “Research suggests the greatest potential for successful CWD management actions occurs when prevalence is low”.

“Greatest potential for success” is ambiguous! I am not sure what success is, if it means killing 50% of the population and almost all the mature bucks maybe the cure is worst than the disease. How is this successful when even in these areas that have applied this remedy CWD is still spreading, the units still have CWD prevalence at lower rates, I am convince that most of the deer hunting public has a different definition of success and this statement does not capture it. Also, the use of the terminology “when prevalence is low” what exactly is low, the group choose 5% based on limited input from researchers, the Colorado Game and Fish Commission choose 10%, the 5% is an arbitrary number.

Also, the statement lack specificity on how this would be applied. Is it at the herd unit level, hunting unit level, population segments within hunting unit, or at selected hot spots in a hunting unit. It is to broad a brush without limiting it as a management prescription to be selectively used only in hot spots.

Also, it is very problematic using the 5% prevalence rate. Is this prevalence in the population or is it prevalence within the sample size these numbers could be substantially and statistically different. This is not clear in the statement is it the population or the sample data. We do not have a calculated prevalence rate within the population. Currently we only have it as a percent within the sampling data which will have a higher rate than the general population. Let me explain! Research has shown that mountain lion predation has a higher percentage of CWD animals than the general population, road kill also has a higher percent CWD than general population. What these have in common is that both are selecting animals that are mentally facultatively deficient (they are stupid because of brain deuteriation). If this is the case then we would expect these same deer to have a higher rate of human harvest (because they are stupid) than the general deer population. This brings me back to my original question is the 5% based on a biased sample or is the recommendation based on 5% prevalence within a random sampling and at what level.

Most importantly the hunting public in some of the more popular particularly the high use Baggs herd unit and the Wyoming range trophy units will not support the drastic reduction in deer population, reduced buck: doe ratio, and reduction in older age class bucks that this recommendation calls for. To put it bluntly this will cause a shit storm if the department decided to move forward with this recombination in many of the hunting units in the state."

5.2 Option 1: Increase mature buck harvest in order to lower CWD prevalence from current levels by a percentage deemed appropriate through local processes and with consideration to WAFWA's "Recommendations for Adaptive Management of CWD in the West" document.

Kent Connolly: "We don't have enough information to hang our hat on any data including WAFWA, Colorado has the worst track record in the west with its rate of spread and we discussed it like it was the best ever done? and states like Texas hunt every horn site with a good CWD result and Utah to some extent."

Larry Hicks: "Until we know why mature bucks have a higher prevalence rate than does we should not implement harvest strategies without trying to find out the answers. We sample bucks at a rate of 10:1 or higher than does. Is this a sampling error? When ask the question Mike Miller from Colorado said we do not know why bucks have a higher rate of detection. Maybe we should do some limited experimental design harvest and sampling to try and answer this question before we just start killing all the mature bucks. Once again, I am convinced this recommendation is unacceptable without some very specific and very limited application. It is too broad and lacks specificity on how it would be implemented by the department. WAFWA recommendation should be considered but not used as the be all do all. With CWD they are predicated on "the best guess" method. They are predicated on what we know and what we know is we do not know much about CWD. I will not go into the list of all the thing we do not know but it is substantial to say the least. One example is how many different ways can CWD be transmitted?"

5.7 Consider options to refund license fees for cervids that test CWD positive in areas where an experimental management strategy is in place.

Justin Caudill: "My issue with this recommendation is due to reservations centered around any type of license refund having the potential to put WGFD in a tight spot on several levels; where will the funding come from, how much will it cost WGFD in refunds for a single year for a specific area - how many years will this continue in that specific area, who is responsible for the meat if it is found to positive for CWD. I would support WGFD in performing science based experimental management strategies to adjust harvest objectives or the sex ratios of a given heard unit, or adjusted timing and or season of a hunt but not license reimbursement."

Kent Connolly: "Creates too much overhead, too much government and we are having trouble funding schools the legislator will kill it."

Steve Robertson: My vote was centered on my struggle to understand the science behind preemptively culling or starving a cervids population that may or may not have a prevalence CWD. Not knowing what we don't know makes me question the cost/benefit of such.

I understand the dependency relationships between habitat and wildlife, and that of the predator, and the prey. I also understand the associated concept of carrying capacity. Recognizing the unique wildlife management issues in western Wyoming such as limited habitat for wildlife winter range, wildlife distributions, private land, stock grower, roads/traffic, winter backcountry recreation, and threatened and endangered predator, all these issues are critical considerations to attempting to forecast the impact of CWD and formulating a contingency management plan.

Supplemental feeding has provided a very successful conservation program for over a hundred years in Western Wyoming. It has influences all the issues mentioned above. I believe it could be an important management tool should CWD ever have a prevalence in the area elk herds. It could provide a winter outdoor laboratory to study the disease, daily surveillance for detection and quick removal of infected animals.

I feed elk for the WYG&F Department for a number of years. I know when properly implemented calf recruitment rates can be dramatically improved through supplemental feeding. I believe this could well be a management key to help stabilize and sustain area elk populations should CWD become prevalent in western Wyoming.”

Millie Copper: “If an experimental management strategy is in place, anyone applying for this license should be well aware of the CWD risk. Personal responsibility to know where you are hunting and what you are purchasing, or applying for, is important.

Also, listening to Hank and the costs associated with each CWD, including additional testing needed for each positive result, refunding the license fees doesn't make sense to the bookkeeper in me.

I would be in favor of an option where all hunters could purchase something like insurance. This could work similar to travel insurance with an airline or car rental. Something like the Access Now contribution at the end of putting in for purchase or draw entry. I'd envision this to be a nominal amount (\$5 or \$10) and would coer every cervid license the hunter purchased or received a successful draw. This adds an extra layer to the personal responsibility, allowing people to be fully aware they need to make this purchase in order to have the possibility of a license refund.

With the insurance (I'd call it something other than insurance) the hunter could have a refund if receiving positive CWD result. The money accumulated from people purchasing the insurance could cover the cost of those who test positive. A certain amount of this money could also go toward helping other CWD costs for testing and/or research.”

Rick Pallister: “I wanted to make certain that refunding licenses was a viable and efficient process for WGFG. When Scott Enberg suggested it was possible and more efficient than re-issuing licenses, then my subsequent vote should have been recorded as 3.”

I still have reservations about refunding or re-issuing licenses to hunters who knowingly purchase licenses for hunt areas known to have high prevalences of CWD, or may have a special CWD management option in place. I would like to avoid the perception that we just allow people to keep on killing animals until they get the result they want. However, if this strategy is considered by the WGFD and CWD Working Group as the best option, I will be supportive.”

Larry Hicks: “G&F should list the hunt units with CWD and note that any animal taken that test positive may not be fit for human consumption. We need to place the burden of responsibility on the hunter not the department for their decision to hunt in a known unit with CWD. It's their choice and their liability.”

Sy Gilliland: “If we make sure all hunters are fully aware that animals being hunted in these units are highly likely to be infected then they understand the possible consequences. The department should never place themselves in a situation of sending the signal they are selling a product instead of a hunting opportunity. As an outfitter I am very concerned that a client that kills a CWD infected animal could request a refund. We must all stay the course that Wyoming is home to hunting wild free ranging animals and not providing a product.”

8.7 We recommend WGFD explore the possibility of creating an additional dedicated license with revenue specifically earmarked for CWD research and management.

Garrett Falkenburg: “I am not in favor of the WGFD making another tag or license. It just complicates the license system. Rather I would be more in favor of a fee increase on the conversation stamp with a portion of it being earmarked for CWD.”

Justin Caudill: “While I really like how this recommendation sounds because it will generate a lot of good will and public support. In reality it will generate a small too modest amount of funding for CWD research and management. Also, this new license would be a source of competition against the other dedicated licenses creating revenue for other worthy causes.”

Kent Connolly: “Too much overhead again and government and would only target areas that would drive hunting numbers down, we need the deer taken. Why would you hunt a high area given the policy that you shouldn't eat it. Leads to more illegal dumping which is VERY high right now.”

Steve Martin: “The G&F already has too many of these types licenses available. It is not a good idea and we should look at other ways to generate funds like a stamp. These types of licenses will not generate enough funds to help with research or management.”

Millie Copper: “Initially I was in favor of this. It sounds like a wonderful option to create funds for CWD expenses. Then Senator Hicks explained how the funding for WGFD currently works. Nick and several others explained how special licenses work and can impact hunting opportunities for others. With this information, I can't support a dedicated license which could reduce hunting opportunities for the average person.”

Rick Pallister: “I simply think there are better places and strategies with which to raise the necessary funds, including Congress and the Wyoming Legislature.”

Laura Meadows: “We recommend WGFD explore the possibility of creating an additional dedicated license with revenue specifically ear marked for CWD research and management. - *I cannot support removing licenses that are currently available to the public and transferring those opportunities to a high bidder situation.*”

Nick Dobric: “There are lots of “specialty” tags out there and they are becoming increasingly controversial to the general hunting public. The current allotment of Commissioner tags, etc mentioned in 8.6 should allow for generating funds specific to CWD without creating an additional specialty tag.”

Dan Smith: “I have major reservations with creating a license with revenue specifically earmarked for CWD research. The vast majority of funding for the WY Game and Fish Department comes from license sale dollars. The Department has a budgeting process that is very fiscally responsible and will allocate funds from existing budgets for high priority projects like research and management of CWD. To start earmarking specific dollars to specific projects opens the door for other interests to seek designated licenses taking away from the Department's ability to prioritize their own budget; a slippery slope. I favor allowing the Department to prioritize their funding as they see fit and budget appropriately.”

Andrew Pils: “I voted a “4” because I believe there are already too many special licenses available. Adding more would take away opportunity from hunters applying in the draw, plus potentially place more pressure on certain units that already absorb increased pressure from the special licenses currently available. I would prefer to explore options for securing funding for CWD management and research from existing special licenses, rather than creating new ones”

Kristen Gunther: “My 4 was on 8.7, which would have created a special CWD tag. I oppose the creation of a dedicated license, both because it would be another special tag to manage on the department side and on the grounds of protecting equity in hunter opportunity.”

Libby Lankford: “I don’t like another “special tag” it takes out of the tag supply number that people can draw for. I’d rather just use an already existing special tag to give to NGOs to raffle and have them donate a portion or something along those lines. Also, I don’t like the reissue or refund of tags at all because people know the risk of putting in for high CWD prevalence hunt areas. I think we as adults can weigh the risk and reward.”

Bruce Lawson: “I chose not to support or agree with consensus item 8.7 as I believe that the WGFD already has too many set aside type licenses and I don’t support the creation of additional set aside licenses. Other means of generating revenue for CWD management should be pursued by the Wyoming Game and Fish Commission.”

Larry Hicks: “All ready to damn many special set aside license issued.”

Josh Coursey: “We simply have too many special licenses now and this opens a can of worms for the next cause or effort to think that this is part of the fiscal solution. Frankly put, if there

was a specialty license made available for a cause specific effort, CWD would not make my top 5 list.”

Sy Gilliland: “This is not needed and if additional funding is needed and it is lets go for an across the board license fees increase. If the department still feels it needs a dedicated funding stream then lets raise the cost of a conservation stamp and dedicate those funds. I would never ever want to see a CWD stamp that would send a horrible signal to hunters.”

8.9 Evaluate the effect of predators/large carnivores at a local level on CWD prevalence, transmission, and management implications

Kent Connolly: “States that have high numbers of predator's taken like Utah and Texas don't have the issue like states that limit it or ban it like COLORADO. Letting them 1/2 kill animals and kill them will only increase the number of domestic animals that are taken, we have to many conflicts now increasing it will not be taken lightly by the sportsman or the public of Wyoming.”

Larry Hicks: “It is politically unacceptable to increase predators as a mechanism to reduce or manage CWD, not to mention public surveys have indicated that the preferred method of harvest was by hunter not G&F personnel. I am pretty sure that if ask that over whelming the hunting public would say they prefer to harvest the animals versus predators. People want to hunt!”

Sy Gilliland: “This idea is a terrible idea. What this says is let’s annihilate a herd by increasing predators. So, then we have impacted not only the deer herds but also the livestock operations in those areas. I believe the cure is way worse than the cause when it comes to manipulating higher predator populations as a possible CWD management tool.”

8.12 Conduct field studies to determine if artificial cervid aggregation is increasing CWD prevalence (e.g. underpasses/overpasses, water holes, feed grounds, etc).

Kent Connolly: “Under passes work if not for deer it’s a safety issue for humans. Removing Feed grounds, water holes etc., will just intensify them on private property and cities plus move them were they starve or get run over. All migratory animals congregate at the STOP OVER area's as documented in the Corridor data which the Task force on Corridor's says to protect and we are going to say spread ‘em out and screw up the corridors. I don't think we will make policy that dictates how animals migrate. But we can save animals and people's lives.”

Millie Copper: “My only issue with 8.12 is the inclusion of feed grounds as an example. While I may personally believe the feedgrounds are a potential CWD issue, in 1.4 we made a point of pulling in a stakeholder working group to specifically work with feed grounds. I believe leaving this as an issue to be focused on in a separate group, and looked at for more than CWD, is necessary.

I'll admit, I had no idea how controversial the feed grounds were until this working group! Holy buckets. Removal of feed grounds from the example would move me to a 2 on this recommendation.”

Larry Hicks: “With all the other research needs this seems to be low priority. Even if the research was conclusive are we really going to bull doze all the stock pond, demolish the wildlife under and over pass’s and banning the placing of salt on rangelands for livestock. Not likely.”

Laura Meadows: “Conduct field studies to determine if artificial cervid aggregation is increasing CWD prevalence (e.g. underpasses/overpasses, water holes, feed grounds, etc). - *Correlating microscale habitat features (either natural or artificial) with prevalence that is calculated on hunt area scale is a very difficult to impossible task. A study such as this, although the results of which would be undoubtedly valuable, does not seem feasible with currently available tools.*

Sy Gilliland: “My problem with this recommendation is several. So we have spent a ton of money building overpasses/underpasses for the benefit of wildlife and reducing vehicle collisions. We are going to continue doing this regardless because its the right thing to do. We have invested significant amounts of money and effort developing water in our very arid state for the benefit of wildlife and our AG community. So that isn’t going to change either because once again its the right thing to do. Our western elk herds only exist in hunt able numbers because of feed grounds. If we quit feeding we would lose a solid 80% of our public land elk herds and cause major impacts upon the AG community. Elk leaving their traditional wintering area would end up on private land and onto our limited mule deer wintering areas. So all the examples used in 8.12 are really horrible ideas and shouldn’t even be considered.”

Note: Ambrosia Brown opposed recommendations 5.7, 8.7 and 8.9. We will add her comments when we receive them.

6. NEXT STEPS

During October and November 2019 WGFD will draft the next version of the CWD Management Plan to address the recommendations of the Working Group. This will be presented to the public in the second set of public meetings in December 201 (see Section 2 above for details). This draft plan and the public response will inform the Working Group's final recommendations in February 2020.

Additional materials and information can be found at:

<https://wgfd.wyo.gov/Wildlife-in-Wyoming/More-Wildlife/Wildlife-Disease/CWD-in-Wyoming-Wildlife/CWD-Working-Group>

Appendix A: Agenda for First Public Meetings



CHRONIC WASTING DISEASE PUBLIC WORKSHOPS

Website: <https://wgfd.wyo.gov/Wildlife-in-Wyoming/More-Wildlife/Wildlife-Disease/CWD-in-Wyoming-Wildlife/CWD-Working-Group>

Agenda Workshop 1 of 2, 6 – 9 pm

May 28, Laramie, May 29, Casper, May 30, Sheridan

June 3, Worland, June 4, Pinedale

Objectives:

1. Introduce the Chronic Wasting Disease collaborative process and its purpose.
2. Provide information regarding the current knowledge regarding CWD.
3. Provide local information regarding CWD.
4. Provide the CWD Working Group with ideas to consider in developing management options for CWD.
5. Discuss next steps.

6:00 pm	Introductions to People and Process.	Scott Edberg/Jessica Western
6:15	Current Knowledge regarding CWD	Mary Wood and Hank Edwards
6:45	CWD Impacts to Deer	Justin Binfet
7:00	Local CWD information	Local WGFD representative
7:10	CWD Management	Mary Wood
7:20	CWD Questions	WGFD

7:35 Breakout Groups:

What are ideas you would like the CWD Working Group to consider in developing management options for CWD in Wyoming?

8:25	Report Back	Jessica Western
8:35	Questions and Discussion	Jessica and WGFD
8:55	Next Steps	Jessica Western
9:00	Adjourn	Scott Edberg/Jessica Western

Appendix B. Suggested management options from initial public meetings.

Problem (Theme)	Issue (Subtheme) <i>N/A = No subtheme identified</i>	May/June Public Process Break-out Group Results: Management Options
1. Artificial Concentration	1.1 Agricultural	1.1.1 Rotate Crops to distribute deer.
		1.1.2 Limit salt sources.
		1.1.3 Target deer in concentration area, i.e. agricultural fields.
		1.1.4 Target concentrations of deer in agricultural fields early in season.
		1.1.5 Focus efforts to remove dead deer from agricultural fields.
		1.1.6 Consider salt-blocks – make unavailable to wildlife.
	1.2 Reduce/Remove	1.2.1 Potential role of feedgrounds.
		1.2.2 Feed grounds – is there a way to prevent?
		1.2.3 Montana is going to sue Wyoming when CWD gets to feed grounds.
		1.2.4 Feed grounds need to be discussed.
		1.2.5 Are habitat management areas acting like feed grounds: other concentrations of animals?
		1.2.6 Hypocrisy of regulating public/feeding of wildlife with continuation of elk feed grounds and support for feed grounds.
		1.2.7 Removal of artificial food sources
		1.2.8 Reduce concentration of animals – artificial food sources/hot spots.
		1.2.9 Reducing artificial concentration points, stock H2O points, etc.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
1. Artificial Concentration cont'd	1.3 Save Feed Grounds	1.3.1 Leave feed grounds alone – no action.
		1.3.2 Feed grounds: add more to spread elk out more.
		1.3.3. Save our feed grounds at all costs.
	1.4 Townies	1.4.1 Feeding town deer: abolish.
		1.4.2 Are larger urban areas contributing to high prevalence?
2. Cervid Remains	2.1 Carcass Removal	2.1.1 Carcass removal program
		2.1.2. Transportation in state from Hunt Area to Hunt Area
		2.1.3 Growing carcass disposal/landfill disposal of carcasses. Cost. Leaving carcass in the field. Make carcass disposal free
		2.1.4 Carcass disposal in field and at home.
		2.1.5 Strict carcass disposal regulations within the state.
		2.1.6 Address Carcass removal
		2.1.7 Disposal options for carcasses.
		2.1.8 Transportation of carcasses/processed meat.
		2.1.9 Controlling movement of dead animals/parts.
		2.1.10 Proper carcass disposal.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
2. Cervid Remains cont'd	2.1 Carcass Removal cont'd	2.1.11 Proper carcass disposal – out of field.
		2.1.12 Department should consider guidelines for the public to dispose carcasses. Consider incentives.
		2.1.13 Dispose in landfill.
		2.1.14 Proper disposal.
		2.1.15 In higher prevalence areas require entire carcass to go to landfill.
		2.1.16 Need to address carcass disposed in areas where there is landfill restrictions or no landfills.
		2.1.17 Incinerator facility/carcass disposal.
		2.1.18 Consider carcass disposal/issue.
		2.1.19 Management of carcasses – ultimate disposition
		2.1.20 Limit carcass movement to areas with no/low prevalence.
		2.1.21 Certification of CWD-free waste.
	2.2 Regulations	2.2.1 Are we going to change regulations to address hunters having to dispose CWD positive animals?
		2.2.2 Make carcass disposal easier in those areas with landfill restrictions.
		2.2.3 Regulate use of deer parts (e.g. urine, etc.).
		2.2.4. Carcass and equipment monitoring, restrictions.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
2. Cervid Remains cont'd	2.2 Regulations cont'd	2.2.5 Centralized carcass disposal/management: removal regulations for high prevalence areas.
		2.2.6 Ban deer urine.
3. Communication	3.1 CWD Prevalence	3.1.1 In application packet list CWD prevalence by hunt area, not simply presence/absence.
		3.1.2 More updated information in hunter safety classes
		3.1.3 Increase info to public, taught in hunter safety, talk and inform NGO groups, social media.
		3.1.4 Maintain transparency and information provision to the public.
		3.1.5 More CWD information.
		3.1.6 Social media: Ongoing work with other states. Links to website for info. Public field monitoring.
		3.1.7 CWD deer and elk distinction – need to message to the public.
	3.2 N/A	3.2.1 CWD results should specify license number in the letter hunters receive for positive results.
4. Education	4.1 N/A	4.1.1 Better education on handling of carcasses.
		4.1.2 Need education regarding prevalence and impacts of CWD. Then consider management action.
		4.1.3 Education for hunters on how to minimize spread of disease.
		4.1.4 CWD education pre/post management plan to hunting and general public.
		4.1.5 Educate the non-hunters about CWD and herd management.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
4. Education cont'd	4.1 N/A cont'd	4.1.6 Is there a way to sell CWD management to the general hunting public?
		4.1.7 Educate public about signs of disease in animals – earlier removal.
		4.1.8 More education – all avenues available to get the word out and get support: 1. Convince the public there is a problem. 2. Use public health epidemics as example.
		4.1.9 More public info and education!
		4.1.10 Education, work with landowners increase late season licensing, improve hunter access to focus management.
		4.1.11 Public should be informed about what to do with sick/dead animals.
		4.1.12 Educate taxidermists on CWD signs.
		4.1.13 Communication and education with the public on all/any management.
		4.1.14 Education of public.
		4.1.15 Educate hunters on what to leave in the field.
5. Genetics	5.1 N/A	5.1.1 Genetic mapping to better understand susceptibility and resistance.
		5.1.2 Genetic links to survivability differences deer vs. elk? Why do some big deer survive while others die?
		5.1.3 Genetic modification of deer for resistance.
		5.1.4 Will animal adapt over time?
		5.1.5 Genetics – mapping, study resistance.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
5. Genetics cont'd	5.1 N/A cont'd	5.1.6 Accept genetic bottleneck -> resistance.
6. Habitat	6.1 N/A	6.1.1 How can we address habitat degradation?
		6.1.2 Habitat: good seasonal habitat to spread out animals – manipulation of habitat – tie in with research – population manipulation.
		6.1.3 Habitat.
		6.1.4 Look at environmental prevalence.
		6.1.5. Study plant uptake.
7. Hotspots of Prions	7.1 N/A	7.1.1 Target hotspots in herds that do not migrate (all deer, not just clinical)
		7.1.2 Reduce hotspots
		7.1.3 Test for hotspots, environmental and plant.
		7.1.4 Most transmission environmental.
8. Human Health	8.1 N/A	8.1.1 Be transparent about info known about CWD transmission to humans. Make that data more available through WGFD avenues.
		8.1.2 Are we creating fear (health concerns) or undue wasting problems. And economic concerns.
		8.1.3 Human safety concerns.
		8.1.4 Concerns with current information about the disease – how do we effectively apply management actions with unknown results/impacts?
		8.1.5 Human safety concerns.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
8. Human Health cont'd	8.1 N/A cont'd	8.1.6 Consider human health – potential for species cross-over.
		8.1.7 Human health implications.
		8.1.8 Continued research and education on human health.
9. Landowners	9.1 N/A	9.1.1 Landowner incentive to allow access
		9.1.2 Giving landowners an active role in responsibility of managing herds, transmission, disposal, etc. (Increasing landowner coupons to give incentive.)
		9.1.3 Landowner participation required for desired harvest levels and sampling efforts – consequences for not participating.
		9.1.4 Allow landowners to be involved in recording/observation of deer/CWD.
10. Management	10.1 Buck Harvest	10.1.1 Harvest bucks at higher rates
		10.1.2 Sacrifice area with season structure e.g. late season to target bucks – long-term.
		10.1.3 Management should target larger mature bucks.
	10.2 Determine Threshold	10.2.1 Develop statewide goal for CWD prevalence.
	10.3 Experiment	10.3.1 Continue with 5-year objective reviews, but take a closer look at CWD.
		10.3.2 Look at females to male ratios and manage for ratios that are favorable for disease management.
		10.3.3 We have to attempt something in order to learn about the disease.
		10.3.4 Satellite to (sting?) sites.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
10. Management cont'd	10.3 Experiment cont'd	10.3.5 Apply WAFWA management plans in one location all together to see if parts of each work together to reduce CWD.
		10.3.6 Management: Control area where all cervids are removed and an exclusion fence is created to allow area to allow all prions to degrade.
		10.3.7 Experimental design: different levels or types of management.
		10.3.8 Try limited population control on trial bass to see if it works.
		10.3.9. Stick with hunting season structure (late deer hunting) (N. Fork) that public likes, use as experiment. ID area where to use experiments/structure.
		10.3.10 Look at harvest rates of bucks, does and season lengths.
	10.4 Focused harvest	10.4.1 Should consider focused, high intensity harvest in high CWD prevalence areas. Consider designating small hunt areas to focus harvest.
		10.4.2 Increase licenses in high prevalence areas over a set period to observe a noticeable impact. 5, 10 15 years?
		10.4.3 Kill them all if there is application in small – have to get public buy-in.
		10.4.4 Increase harvests/licenses in social groups ("hot spots")
		10.4.5 Reduce densities.
		10.4.6 Cull targeted areas/s.
		10.4.7 Cull statewide.
		10.4.8 Remove sick deer.
		10.4.9 Be specific in culling – target sick deer.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
10. Management cont'd	10.4 Focused harvest cont'd	10.4.10 Focus potential management strategies in areas of increased prevalence.
		10.4.11 Use public for ungulate density decrease efforts – potential.
		10.4.12 Allow hunters to shoot positive deer without tagging or calling warden
		10.4.13 Focus efforts in low or no prevalence areas to keep them low.
		10.4.14 Base potential management in areas of 95% confidence interval
	10.5 Funding	10.5.1 WGFD pay a processing fee.
	10.6 General	10.6.1 Contain/control the spread of CWD
		10.6.2 Multiple approaches
		10.6.3 Management is necessary.
	10.7 Keep Status Quo	10.7.1 Keep herd management at status quo- no action.
		10.7.2 No eradication efforts
		10.7.3 Status quo with minor changes.
	10.8 Late Harvest	10.8.1 Late season deer season – point restriction 3 point or more
		10.8.2 Post rut deer hunt.
	10.9 Look at other plans	10.9.1 Look at existing studies and knowledge from former CWD plans, try to implement.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
10. Management cont'd	10.9 Look at other plans cont'd	10.9.2 Management plan similar to Colorado – mandatory testing.
		10.9.3 Other states: what has/hasn't worked.
	10.10 Monitoring	10.10.1 Monitoring management strategies for long periods of time.
		10.10.2 Continue monitoring and refining ability to defeat spread.
	10.11 Moose	10.11.1. Pay attention to moose.
	10.12 Mule Deer	10.12.1. Consider targeting mule deer groups or population segments which employ a resident (non-migratory) life history/strategy for more aggressive harvest strategy.
	10.13 Pronghorn	10.13.1 Pronghorn and CWD
	10.14 Public Reaction	10.14.1 Won't come back to hunt in CWD areas.
		10.14.2. Assurance that population management will have positive impact on prevalence.
	10.15 Refund/New tag	10.15.1 Helping hunters who harvest positive deer – tags are refunded
		10.15.2 Harvesting a CWD animal and having the opportunity to harvest at least one more
		10.15.3 Additional hunting licenses if cervid is positive.
		10.15.4 Hunters should get another license if they harvest a positive animal.
		10.15.5 Reissue tag to hunter that harvests CWD deer.
		10.15.6 Reissue tags to hunters who harvest CWD positive deer.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
10. Management cont'd	10.15 Refund/New tag cont'd	10.15.7 Look at additional licenses with CWD positive results.
		10.15.8 Replacement tag for hunter animals that test positive.
		10.15.9 Re-issue licenses with CWD positives.
		10.15.10 License refund/replace for positive test harvest.
		10.15.11 Hunters that harvest positive animals in targeted areas are issued another license valid for that area free of charge.
	10.16 White Tail Deer	10.16.1 Allow unlimited harvest of WTD.
		10.16.2 Decreasing white tail densities in general.
		10.16.3 Sympatric WTD populations should be considered as a contributor to CWD and for increased harvest.
		10.16.4. If WTD prevalence is higher than MD then focus management on WTD.
		10.16.5 Liberalized harvest should incorporate youth hunters.
		10.16.6 Non-resident harvested deer (high priority).
		10.16.7 Denature prion in environment.
11. Migration	11.1 N/A	11.1.1 Migration corridors not a concern.
		11.1.2 CWD plan should emphasize importance of migration corridors to allow animals to disperse to low density areas.
		11.1.3 Migration routes: long term effects and spread of CWD

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
11. Migration cont'd	11.1 N/A cont'd	11.1.4 Determine prevalence between local deer and migratory deer in same area.
		11.1.5 Initiate study of prevalence in migratory deer in 164 compared to resident deer. Track migratory deer.
12. Minerals	12.1 N/A	12.1.1 Alternative research: minerals
		12.1.2 Mineral supplements research: copper, Zinc, magnesium
		12.1.3 Mineral blocks/supplements?
		12.1.4 Mineral deposits and correlation with CWD.
13. Predators	13.1 Increase hunt	13.1.1 Increase predator populations
		13.1.2 Predator license quota balance – less lions/predators harvested by public.
		13.1.3 Increase mountain lion and bear populations.
		13.1.4 Study stress related effects of lions/predators: PTSD?
		13.1.5 Predator control – increase predator quotes, trapping quotas?
		13.1.6 Predator management/stress reduction.
		13.1.7 Predator management in relation to MD management.
		13.1.8 Manage predators during periods of low populations.
	13.2 Use predation	13.2.1 Study predators dispersing ungulates to lower prevalence.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
13. Predators cont'd	13.2 Use predation cont'd	13.2.2 Role of wolf predation on CWD transmission.
		13.2.3 Lion harvest more conservative to help manage the disease (if targeting CWD positive deer).
		13.2.4 Increase wolves in a high CWD prevalence areas (tolerate predation and scavenging) – study impacts.
		13.2.5 Consider predator management/quotas, increase densities in specific areas.
14. Regulations	14.1 N/A	14.1.1 Review regulations – to reduce potential fines.
		14.1.2 Standards of game processing to reduce cross-contamination.
15. Research	15.1 Better testing, larger sample sizes	15.1.1 Increase sampling.
		15.1.2 Better sample sizes for prevalence estimates: otherwise difficult to be accountable to the public.
		15.1.3 Improve tests.
		15.1.4 Improve sample sizes.
		15.1.5 Need for better testing.
		15.1.6 Research on CWD detection in fecal samples (presence of disease).
	15.2 Big Horn Basin	15.2.1 Control group at parting of the waters (20 mile radius).
	15.3 Environmental	15.3.1 Better environment testing to better understand CWD in the environment (soil, plants)
		15.3.2 Different testing methods: feces, soil – can we utilize these for more testing?

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
15. Research cont'd	15.3 Environmental cont'd	15.3.3 Study if environmental contaminants from ag (e.g. herbicides) have synergistic effect (has it been studied?).
		15.3.4 More research on correlations between prevalence of CWD and environmental factors.
	15.4 Funding purpose	15.4.1 Increase/Need funding.
		15.4.2 Working group should pursue additional funding to determine why prevalence is higher/lower in different hunt areas.
		15.4.3 Increase funding for more research on CWD
		15.4.4 Increase research funding and education.
		15.4.5 More \$\$\$\$!
		15.4.6 Donation for CWD research when purchasing license.
		15.4.7 Greater resource of funding (feds)
		15.4.8 GF stamp for CWD
		15.4.9 Place more funding to CWD research and management, needs to come from general fund. Broad financial SW implications. Funding future issues for Department.
		15.4.10 Funding – sustainable.
		15.4.11 Lobby legislators for support and funding
		15.4.12 Department should seek out alternative funding opportunities.
		15.4.13 Consider funding source for CWD research/checks that does not rely on hunters (conservation groups, government).

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
15. Research cont'd	15.4 Funding purpose cont'd	15.4.14 20% of resident licenses allocated for special draw + (\$200.00) same as non-resident all increased funds from this fund CWD research.
		15.4.15 Volunteer donation with purchase of tag.
		15.4.16 Licenses increase of \$ 2.00 to send \$\$ to CWD research.
		15.4.17 Need to task legislature with funding for testing of targeted areas (hunters don't pay).
	15.5 General	15.5.1 Research long-term
		15.5.2. Research of correlation between deer and elk: collar elk/deer – Looking at internal function – test specific groups – where do the animals contract the disease? – what are they eating? – change of diet, seasonal.
		15.5.3 Immune system – correlation with poor weather, lack of food, etc. and increasing CWD prevalence.
		15.5.4 Research (general) and genetics.
		15.5.5 More research.
		15.5.6 More research!
		15.5.7 More research on CWD fundamentals.
	15.6 Genetics	15.6.1 Plan needs to pursue research on genetic factors that influence animal susceptibility/immunity.
		15.6.2 If research identifies genetic resilience, reduce harvest on these deer.
	15.7 Lichen	15.7.1 Need more research (lichen association with CWD).

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
15. Research cont'd	15.8 Literature	15.8.1 Worldwide synopsis of known peer-reviewed literature.
	15.9 Males	15.9.1 Modeling mature males with CWD
	15.10 Nutrition	15.10.1 Nutritional research
	15.11 Prions	15.11.1 Pursue research on modifying/destroying CWD prion.
		15.11.2 Find out what will kill prion then come up with fix . (culling is not working). (Supplement feeding of deer to cure). Develop/use vaccine in feed (supplemental feeding).
		15.11.3 Concentration of prions – better to concentrate, spread out?
		15.11.4 Need to determine rates of prion sloughing.
		15.11.5 Denaturalization and re-naturalization of proteins and related pure research.
	15.12 Social Science	15.12.1 Public survey (consumptive/non-consumptive) at CWD attitudes.
	15.13 Transmission	15.13.1 Understand transmission and why higher prevalence of bucks.
		15.13.2 More research about transmission.
		15.13.3 Track transmission to species outside of cervids.
	15.14 N/A	15.4.1 Impact environmental services.
		15.4.2 Air quality/inventory.
		15.4.3 Study controlled herds

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
16. Testing	16.1 Citizen Science	16.1.1 Reporting tool – concentration of (living or dead) animals (citizen science).
	16.2 Decrease test turn-around time	16.2.1 Increase test turn-around time.
		16.2.2 More work toward higher efficiency and access to testing – shorter turn-around times.
		16.2.3 Fast turnaround samples for hunters.
	16.3 Field Test	16.3.1 Research for an immediate field test that can be collected by hunters?
		16.3.2 Work to develop a simple field test so hunters can check if animals are positive or negative at harvest site.
		16.3.3 Easier testing availability/self-sample
		16.3.4 Increased sampling: provide all hunters with CWD kit. Make it reward based.
		16.3.5 Quicker testing options for harvests.
		16.3.6 Field test kit?
		16.3.7 Rapid field test, to make decision on processing/consumption.
		16.3.8 Make sampling convenient.
		16.3.9 Train hunters/volunteers to sample harvested deer.
		16.3.10. Ability to do test and slaughter by hunters.
		16.3.11 Find easier ways to test.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
16. Testing cont'd	16.4 Considerations	16.4.1 Collect data: High quality baseline, Statewide data collection, Don't infer from small samples, Mandatory testing - Check stations or field check - Logistics? Who checks? Keep checks yearly or every other year - Identify location of kill.
		16.4.2. Use volunteers? NGOs, Public. For sampling: Very focused season. After monitoring and after original hunting season, Include females in harvest plan, Culling vs. harvest, More PR from Game and Fish – be transparent on why harvesting or culling, Mandatory checks – incentives? Non-invasive sampling? Fecal? Vegetation? One deer. Sample more than lymph node. Fecal, urine, saliva.
	16.5 Lead Research facility	16.5.1 Having a lead facility: 1 facility to do main research on CWD among all states.
	16.6 Mandatory harvest test	16.6.1. Mandatory harvest-check statewide all species
		16.6.2 Mandatory testing.
		16.6.3. Increase sampling, maybe mandatory.
		16.6.4 Mandatory Sampling: Turn in sample or be penalized - Kits to hunters/25% etc. - Volunteers/federal employees in the field - Covers all Cervids – Work with businesses – Education to pull samples – Hunter Education re. sampling.
		16.6.5 Mandatory check in: leaving doe/cow heads in field limits what can be sampled.
		16.6.6. Mandatory sampling and harvest reporting (increase license price to pay for sampling or offset cost with CWD stamp, similar to feedground elk stamp).
		16.6.7. Mandatory testing should be implemented for hunter harvested mule deer.
		16.6.8. Mandatory sampling or provide incentives to increase sample sizes.
		16.6.9. Mandatory sampling of harvested animals so you can get good data.
		16.6.10 If sampling is mandatory, come up with way to cover cost. Check points for hunters.

Problem (Theme)	Issue (Subtheme)	May/June Public Process Break-out Group Results: Management Options
16. Testing cont'd	16.6 Mandatory harvest test cont'd	16.6.11 Look at benefits of mandatory testing: incentives vs. regulation.
		16.6.12. Require every tag filled to test for CWD: Mandatory check-ins – volunteers to help collect samples. Carcass test negative before being accepted into a processor Or ear-tag/collar resident deer (towny deer) to study and design experiments to control Chronic Wasting Disease.
	16.7 Targeted testing	16.7.1 Check targeted herd units
		16.7.2 For sampling, pick one area to focus on, set up check points.
		16.7.3 Focus testing on specific areas where deer are concentrated (town).
	16.8 Test and cull	16.8.1. Live test and cull.

Appendix C: CWD Working Group Charter

Chronic Wasting Disease Working Group Group Charter

FINAL

1. BACKGROUND AND PROJECT DESCRIPTION

Chronic wasting disease (CWD) is a chronic, fatal disease of the central nervous system in deer, elk, and moose. CWD belongs to a group of diseases called transmissible spongiform encephalopathies caused by abnormal proteins called prions. First documented in southeast Wyoming in 1985, the disease is now found in the majority of the state. There is growing evidence that CWD can impair deer and elk populations in areas with a high proportion (prevalence) of infected animals.

In response to increased concerns regarding CWD in Wyoming's cervid (deer, elk, and moose) populations, the Wyoming Game and Fish Department (Department) will convene a public process to update management recommendations in the Department CWD management plan. This process will utilize public meetings to solicit public input and work with the Ruckelshaus Institute to convene a CWD Working Group.

2. PURPOSE

The CWD Working Group will explore CWD scientific information, cervid management, and public input to evaluate management options to minimize CWD in Wyoming's cervid populations. The Working Group will create recommendations to the Department for incorporation into a revised CWD management plan.

3. PRODUCTS AND OUTCOMES

Under this Charter, the Working Group will provide recommendations for CWD management options that local Department managers may consider. Those recommendations will be utilized by the Department to create a revised CWD management plan.

4. GEOGRAPHIC AREA

Recognizing this is a cross border issue; however, this effort will be primarily developing CWD recommendations to benefit Wyoming cervid populations with an eye towards other western cervids.

5. WORKING GROUP MEMBERSHIP AND REPRESENTATION

The Working Group is representative of persons with interests in Wyoming's cervid herds. Although it is recognized that Working Group members have multiple interests and may participate in discussions from various perspectives, Working Group members broadly represent the following organizations and interest groups:

- Local Government
- Governor's Office
- Legislator
- Agriculture and landowner community
- Wyoming Game and Fish Department
- Outdoor media
- Outfitting businesses
- Federal agencies
- State agencies
- Sportspeople
- Conservation NGOs
- Scientists
- General public
- Wyoming Game and Fish Commission

Working Group members will be expected to represent the interests of: (1) themselves, (2) organizations that have authorized the Working Group member to represent them, or (3) groups of constituents from a similar stakeholder group. Ideas presented within Working Group discussions will not be assumed to be the official position of the organizations or groups represented unless specifically stated to be so. Working Group members have the responsibility to keep the organizations and interest groups they represent informed about the actions and outcomes of the Working Group's process.

Each organization and interest group is represented by one or more Working Group members. In the event that a Working Group member cannot attend a meeting, they may be represented by an alternate member of their choosing without concurrence of the Working Group. Alternate group members are encouraged to attend Working Group meetings along with the primary group members, but should be fully briefed by the primary group member before attending any meetings as the sole representative.

Members are appointed by the Director of the Department. Term of membership on the Working Group will be through December 31, 2020. Reappointments will be made by the Director. Service on the Working Group by any group member will be at the discretion of the member's constituent organization or interest group.

All expenses, including but limited to travel, lodging, meals are at the expense of the Working group member unless otherwise provided by the Department.

Membership is as follows:

First Name	Last Name	Affiliation	Alternate
Justin	Caudill	State Agency	Jon Cecil
Kent	Connelly	Local Government	Robert King
Millie	Copper	Sportsperson	Joe Inglis
Joshua	Coursey	Conservation NGO	Joey Faigl
Jeff	Daugherty	Conservation NGO	Steve Robertson
Nick	Dobric	Conservation NGO	Madeleine West
Luke	Esch	State Agency	
Garret	Falkenburg	Landowner or Agricultural Community	Mitchell Falkenburg
Sy	Gilliland	Outfitter	Ambrosia Brown
Kristen	Gunther	Conservation NGO	John Burrows
Dave	Gustine	Federal Agency	Sarah Dewey
Karinthia	Harrison	General Public	Tim Metzler
Martin	Hicks	WGFD	TBD
Larry	Hicks	Wyo. State Legislature	Bo Biteman
Lyle	Lamb	State Agency	Randy Merritt
Libby	Lankford	Landowner or Agricultural Community	Tim Carpenter
Bruce	Lawson	Sportsperson	Nic Dobric
Tony	Lehner	Local Government	Rick Grant
Jim	Logan	State Agency	Steve True
Janet	Marschner	Sportsperson	Lee Stein
Steve	Martin	Sportsperson	
Dax	McCarty	Outfitter	Ambrosia Brown
Laura	Meadows	Conservation NGO	Andrea Barbknecht
Shane	Moore	General Public	
Richard	Pallister	Sportsperson	
Andrew	Pils	Federal Agency	Kerry Murphy
Mike	Schmid	Wyoming Game and Fish Commission	
Brant	Schumaker	Scientist	David Edmunds
Dan	Smith	WGFD	
Joe	Tilden	Local Government	Lloyd Theil
James	Wright	Federal Agency	Brad Jost

6. ROLE OF THE CO-CHAIRS AND STEERING COMMITTEE

Co-chairs will work together to lead the Working Group through meetings in order to reach a set of consensus recommendations. Co-chairs will work with the Ruckelshaus Institute to provide input and direction at various points throughout the process, as well as communicate with the Director when necessary. Co-chairs will participate as full Working Group members, including communicating interests and voting on options.

The steering committee will contribute input on the formation and direction of the Working Group, provide support and feedback to the co-chairs and the Ruckelshaus Institute, and communicate with the Director as necessary. Co-chairs or the Ruckelshaus Institute may convene the steering committee at any point they need guidance on a particular issue.

7. RESPONSIBILITIES OF THE WORKING GROUP

a) Conduct of Working Group Members

Working Group members will engage in open communication at the meetings. This means disclosing interests, needs, actions, and issues in a timely manner and committing to the purpose of the Working Group. The primary responsibility of the Working Group is to balance the interests related to ungulate populations throughout Wyoming in providing advice and recommendations. Working Group members will endeavor in good faith to develop recommendations that are satisfactory to all Working Group members. Working Group members will ensure that an integrated approach is taken in formulating recommendations by meeting together as needed to assure strong communication and collaboration among Working Group members.

b) Keeping Constituents Informed

Working Group members will engage in active communication with constituents about actions and outcomes of the Working Group. Active communication can include written, verbal, and electronic means of communicating. Members will have meeting summaries available to them for keeping constituents informed.

c) Representing Constituents

In developing recommendations, Working Group members will consider the interests of other group members as well as their own particular interest group when reviewing issues and recommendations. Working Group members will invite proposals from their constituents to present to the Working Group and will provide proposals from the Working Group to their constituents for feedback and input.

d) Attending Meetings

Each Working Group member is expected to attend on time and fully participate in each meeting, which includes being present for substantially all of the meeting. Working Group members shall read appropriate materials and arrive prepared to work. Materials presented for discussion should be distributed at least one week in advance of the meeting or longer, as is practical.

In the event that neither the primary Working Group member nor the alternate Working Group member is able to attend a meeting of the Working Group, and the primary Working Group member is not in agreement with any actions taken by the Working Group during their absence, that member has until the meeting summary review at the next meeting to register their dissatisfaction with actions taken. A reasonable amount of time will be devoted to old business at meetings. Email may be used to expedite this process.

e) Understanding and Abiding by the Charter

Working Group members are expected to read, fully understand, and conduct themselves in accordance with the requirements of this charter.

8. RESPONSIBILITIES OF THE FACILITATORS

The Working Group will be facilitated by faculty and staff of the Ruckelshaus Institute at the University of Wyoming. The roles and responsibilities of the Facilitators include:

- Facilitating meetings in a manner consistent with interest-based negotiations and this charter.
- Helping the Working Group stay on task and on process.
- Protecting Working Group members and their ideas from attack while ensuring that provocative issues are not avoided, but are discussed in a candid and respectful manner.
- Helping Working Group members to concisely describe their interests.
- Helping Working Group members find innovative and workable solutions.
- Helping Working Group members reach consensus.
- Providing for equitable participation by all Working Group members.
- Working, both at and between meetings, with Working Group members to assist in the free exchange of ideas between the Members and to resolve any impasses that may arise.
- Periodically surveying Working Group members to assess fairness, meaningfulness and efficiency of the process.
- Maintaining a list of significant topics on which the Working Group has reached consensus or have failed to reach consensus.
- Facilitate collaborative learning sessions with constituents before and after the Working Group has drafted amendments to the CWD management plan.
- Maintain a website.
- Assist in summarizing the work of the Working Group into a final report format to be signed by the Working Group Co-Chairs.

9. RESPONSIBILITIES OF WYOMING GAME AND FISH DEPARTMENT

- Organizing meeting logistics including location, room arrangement, food and evening socials.
- Notifying Working Group members of meeting dates, locations and logistics.
- Keeping meeting attendance records of all Working Group members.
- Hosting website with up to date agendas, meeting notes, and review documents.
- Convene collaborative learning sessions which gather input from constituents before and after the Working Group has drafted amendments to the CWD management plan and report information back to Working Group.
- Providing updates to Wyoming Game and Fish Commission and Director's office for dissemination to interested parties.

- Appointing a designated Department media spokesperson.
- Assist in summarizing the work of the Working Group into a final report format to be signed by the Working Group Co-Chairs.
- Incorporate Working Group recommendations into the CWD Management Plan for presentation to the Wyoming Game and Fish Commission.

10. DECISION PROCESS

The Working Group will operate by consensus of all members represented at the meeting. Consensus is the decision rule that allows collaborative problem solving to work. It is a way for more than two people to reach agreement. Consensus prevents domination by the majority, allows building of trust and the sharing of information, especially under conditions of conflict. Consensus does not mean that everyone will be equally happy with the decision, but all do accept that the decision is the best that can be made at the time with the people involved.

Consensus requires sharing information, which leads to mutual education and provides the basis for crafting workable and acceptable alternatives. Consensus promotes joint thinking of a diverse group and leads to creative solutions. Also, because parties participate in the deliberation, they understand the reasoning behind the recommendations and are willing to support them.

In making decisions, each Working Group member will indicate their concurrence on a specific proposal using a five-point scale. The scale allows Working Group members to clearly communicate their intentions, assess the degree of agreement that exists, and register their dissatisfaction without holding up the rest of the Working Group. The five-point scale is as follows:

1. Endorsement –Member likes it.
2. Endorsement with Minor Point of Contention – Basically, member likes it.
3. Agreement with Minor Reservations – Member does not oppose.
4. Stand aside with major reservations – Formal disagreement, but will not block the proposal/provision
5. Block – Member will not support the proposal.

If the reason for not being able to endorse a proposal is lack of information, the member must specify this and the information that is needed. Once the information has been obtained, the member must re-vote.

Facilitators will measure and record the Working Group's consensus on a given proposal by open polling of the members present. The levels of consensus are:

- Consensus - All Working Group members present rate the proposal as a 1, 2 or 3.
- Consensus with Reservations – All Working Group members present rate the proposal as a 1, 2 or 3, except at least one Working Group member rates it as a 4.
- No Consensus - Any Working Group member present rates the proposal as a 5.

Any Working Group member that rates a significant proposal (i.e., a proposal that involves significant discussion and has the support or qualified support of a majority of Working Group members) as a 4 or a

5 is required to specify their dissention in a written statement for inclusion in the final written report. Dissenters who share the same basic concerns can use a single dissention statement. Dissenters will also identify themselves by name and organization on their dissention statements.

11. FINAL REPORT ON RECOMMENDATIONS

The Department will draft a final report of Working Group Recommendations with support from the Ruckelshaus Institute, to be submitted to the Director and signed by the Working Group Co-Chairs. The report will contain a detailed description of Working Group recommendations. Final recommendations submitted to the Director will include only the consensus recommendations with votes of 1 through 3 fingers. In cases where a member rated a particular proposal as a 4 or 5, their reservation statement will be included with the recommendation. The report will also contain the significant proposals that did not gain the consensus of the Working Group. These proposals will be listed separately from the Working Group recommendations and will be labeled as such. Working Group member dissention statements will be included with these proposals.

The Department will amend the current CWD Management Plan based on the recommendations of the CWD Working Group for review and approval by Department leadership and the Wyoming Game and Fish Commission.

12. AD HOC GROUPS

Ad Hoc subcommittees may be formed in order to address specific topics or issues. Work generated from these subcommittees will be reported back to the full Working Group. Subcommittees will follow the same ground rules for interaction as the full Working Group. Subcommittees may choose to bring in subject matter experts for a particular topic but must first inform the Working Group co-chairs before doing so.

13. GROUND RULES FOR INTERACTION

In order to have the most efficient and effective process possible, Working Group members will follow these basic ground rules:

Discussion Ground Rules During the Meetings

- Raise hand to be recognized by the Facilitator.
- Speak one at a time in meetings as recognized by the Facilitator. Everyone will participate, but none will dominate.
- Be concise and stick to the topics on the meeting agenda. Honor a two-minute time limit for statements and responses unless the Facilitator allows more time.
- Speak only on one topic per entry (no laundry lists).
- Speak to the whole group when talking.
- Avoid side conversations.
- Avoid off-topic questions.
- Treat each other, the organizations represented on the Working Group, and the Working Group itself with respect at all times.
- Refrain from interrupting.
- Monitor your own participation – everyone should participate, but none should dominate.

- Adhere to the agenda and time schedule with diligence.
- Put cell phones on “vibrate” and leave the room when a call is received. Only take necessary calls.
- Be prepared to start on time.
- Recognize that everyone’s interests are important.
- Avoid repetitiveness (i.e., one-track-mind behavior).
- Agree that it is okay to disagree, and disagree without being disagreeable.
- Avoid “cheap shots” and/or sarcasm.
- Refrain from hostility and antagonism.
- Leave personal agendas and “baggage” at the door; put personal differences aside in the interest of a successful Working Group.
- Focus on the problem, not the person.
- Minimize distractions through emails, texting, and other computer work.

Process Ground Rules Throughout the Stakeholder Process

- Adhere to the charter.
- Review information and stay informed.
- Work as team players and share all relevant information. Ask if you do not understand.
- Encourage free thinking. Offer mutually beneficial solutions.
- Encourage candid, frank discussions. Be honest and tactful. Avoid surprises.
- Openly express any disagreement or concern with all other Working Group members. Focus on the problem, not the person.
- Actively strive to see the other points of view.
- When communicating with the media, Working Group members will treat each other, the organizations represented in the Working Group, and the Working Group itself with respect.
- Follow through on commitments.
- Share information discussed in the meeting with the organizations/ constituents represented and bring back to the Working Group the opinions and actions of your constituencies as appropriate.
- Communicate the requirements of this charter with the organizations you represent to minimize the possibility of actions contrary to the charter.
- Commit to issues in which you have an interest.
- Support and actively engage in the Working Groups’ decision process.

14. PUBLIC PARTICIPATION AT GROUP MEETINGS

All Working Group meetings are open to attendance by the public. Members of the public attending the meetings may comment during the specified time at each Working Group meeting. Public comment periods will be specified in advance. Speakers will have time limits set by the Facilitators to allow as much participation as possible within the allotted time. The Working Group will not normally attempt to respond to public or media comments or questions at the meeting in which they were made. The Facilitators have the right to deny the floor to public speakers who are simply repeating previously delivered messages or who are unruly.

Final summaries of Working Group meetings will be available to the public upon request and will also be available on the Department's and Ruckelshaus Institute's website.

15. WORKING WITH THE MEDIA

Working Group members are free to speak with the media. When speaking to the media, members must make it clear they are representing themselves and not the Working Group at-large. If the Working Group member feels uncomfortable speaking with the media, they may refer the media to the Department communications director.

Concise talking points will be generated by the Working Group at the end of each meeting, summarizing the discussion and any decisions made. These talking points may be helpful in communicating with the media, as well as constituents.

16. SCHEDULE AND DURATION

The Working Group will meet periodically at times and locations as set by the Department and approved by the Working Group. The intent of the Working Group is to provide advice and recommendations to the Department. Duration of the Working Group is scheduled for one year. If additional time is needed this can be considered by the Department and Working Group members.

17. AMENDMENTS TO THE CHARTER

Changes to the charter can be made at any meeting of the Working Group by consensus.

Working Group participant signatures approving Charter. Two members were not present.

I agree to collaborate with my fellow Chronic Wasting Disease Working Group Members according to the Charter dates August 12, 2019.		
Signed, August 20, 2019		
Name		Signature
Justin	Caudill	
Kent	Connelly	<i>Kent Connelly</i>
Millie	Copper	<i>Millie Copper</i>
Joshua	Coursey	<i>Joshua W.D. Coursey</i>
Jeff	Daugherty	<i>Jeff Daugherty</i>
Nick	Dobric	<i>Nick Dobric</i>
Luke	Esch	<i>Luke Esch</i>
Garret	Falkenburg	<i>Garret Falkenburg</i>
Sy	Gilliland	<i>Sy Gilliland</i>
Kristen	Gunther	<i>Kristen Gunther</i>
Dave	Gustine	<i>Dave Gustine</i>
Karinthia	Harrison	<i>Karinthia Harrison</i>
Martin	Hicks	<i>Martin Hicks</i>
Larry	Hicks	
Lyle	Lamb	<i>Lyle Lamb</i>
Libby	Lankford	<i>Libby Lankford</i>
Bruce	Lawson	<i>Bruce Lawson</i>
Tony	Lehner	<i>Tony Lehner</i>
Jim	Logan	<i>Jim Logan</i>

I agree to collaborate with my fellow Chronic Wasting Disease Working Group Members according to the Charter dates August 12, 2019.

Signed, August 20, 2019

Name		Signature
Janet	Marschner	Janet Marschner
Steve	Martin	Steve Martin
Dax	McCarty	Dax McCarty
Laura	Meadows	Laura Meadows
Shane	Moore	Shane Moore
Richard	Pallister	Richard Pallister
Andrew	Pils	Andrew Pils
Mike	Schmid	Mike Schmid
Brant	Schumaker	Brant Schumaker
Dan	Smith	Dan Smith
Joe	Tilden	Joe Tilden
James	Wright	James Wright

Appendix D. Working Group meeting agendas



Wyoming Game and Fish Department Chronic Wasting Disease Working Group Meeting 1, July 23 - 25, 2019 Lander, WY

Tuesday, July 23			
Time	Agenda Item	Who	Product/Outcome
12:00	Arrival and Lunch		
12:30	Working Group member introductions and agenda review. Introduce Process.	Co-Chairs Ruckelshaus Institute (R.I.)	Working Group members introduce themselves. Introduction to PrIIOCTA and process. Discuss Outcomes of this Meeting: Charter, Interests and Options.
1:45	Information session <ul style="list-style-type: none">• Overall trends in CWD.• Information	Mary Wood Hank Edwards	Learn about CWD. Discuss materials read in advance.
3:00	Welcome: Working Group purpose and mission and roles. Director Nesvik's charge to the Working Group.	B. Nesvik	Present the purpose and mission of the Working Group and roles of Working Group.
3:30	Break		
3:45	Discussion of public process results: Introduction to public management options.	Jessica Western	Members gain an understanding of how other stakeholders think about CWD in Wyoming.
4:30	Results from Survey	Mary Wood	
5:00	Adjourn		Members gain an understanding of how other stakeholders think about CWD in Wyoming.
6:00	Informal Meet and Greet		Cowfish Restaurant

Wednesday, July 24			
Time	Agenda Item	Who	Product/Outcome
8:00	CWD in Colorado	Mike Miller	Provide comparison for Working Group to consider.
10:00	Break		

10:15	Breakout Groups: Why is CWD important to you? Discussion of Working Group interests in three groups.	R.I.	Develop a list of specific interests of Working Group members and their constituents regarding CWD. This list will guide the Working Group in their deliberation.
11:45	Information Sharing and Information Needs	R.I. and Janet Milek	Find out what information will be helpful to the Working Group for staff to put in Dropbox.
12:15	Lunch		
1:00	Discuss and Decide on Charter	R.I.	Agreement on Charter.
1:45	Break		
2:00 pm	Draft Management Recommendations to be crafted by break-out groups and discussed in whole Working Group.	R.I.	Working Group creates draft recommendations based on management options presented during the public process through review and discussion of data/information. 1. Review the options. 2. Allow for a whole group general explorative discussion. 3. Break-out groups to draft options for recommendations Groups draft options and find consensus options.
5:00	Adjourn for the day		

Thursday, July 25			
8:00 – 11:00	Draft Management Recommendations to be crafted by break-out groups and discussed in whole Working Group.	R.I.	Working Group clarifies drafts recommendations based on options presented during the public process through review and discussion of data/information. 1. Review the options. 2. Allow for a whole group general explorative discussion. 3. Break-out groups to draft options for recommendations Groups draft options and find consensus options.
11:00 am	Public Comment	R.I.	Provide public input into Working Group process.
12:00 pm	Adjourn		



Ruckelshaus Institute
Collaborative Solutions

**Wyoming Game and Fish Department
Chronic Wasting Disease Working Group
Meeting 2, August 20-22, 2019
Casper, WY
DRAFT**

Tuesday, August 20			
Time	Agenda Item	Who	Product/Outcome
12:00	Arrival		
12:30	Working Group member introductions and agenda review. Process Review. Review Information Shared. Constituency Check-In.	Co-Chairs Ruckelshaus Institute (R.I.)	Working Group members introduce themselves and provide updates. Summarize previous meeting and provide overview of Working Group progress and next steps.
1:45	Break		
2:00	WGFD Presents Management of Cervids in Wyoming	Justin Binfet	Overview of how mule deer, white tail deer, elk and moose are managed in Wyoming, including CWD management.
3:00	WGFD presents Management Options for Working Group to Consider	Mary Wood	WGFD provides Working Group with management options based on best available information.
3:45	Break		
4:00	Public Health and CWD	Cody Loveland	Learn about CWD and public health considerations.
5:00	WGFD Data Information	Hank Edwards	WGFD CWD surveillance and monitoring data.
5:30	Adjourn		
6:00	Informal Meet and Greet		Yellowstone Garage

Wednesday, August 21			
Time	Agenda Item	Who	Product/Outcome
8:30	Mike Samuel	Mike Samuel	CWD in Wisconsin.
10:00	Break		

10:15	Review Results from Drafting Recommendations	R.I.	Provide overview of Recommendation work so far.
10:30	Putting it all Together: Evaluate and fine-tune Sub-recommendations and Recommendations	R.I.	The Working Group evaluates each draft recommendation against the interest criteria and, where necessary, re-words them to reach consensus and to facilitate implementation.
12:00	Lunch		
1 pm	Putting it all Together: Evaluate and fine-tune Sub-recommendations and Recommendations	R.I.	The Working Group evaluates each draft recommendation against the interest criteria and, where necessary, re-words them to reach consensus and to facilitate implementation.
3 pm	Break		
3:15 pm	Putting it all Together: Evaluate and fine-tune Sub-recommendations and Recommendations	R.I.	The Working Group evaluates each draft recommendation against the interest criteria and, where necessary, re-words them to reach consensus and to facilitate implementation.
5:00	Adjourn for the day		

Thursday, August 22			
8:00	Putting it all Together: Evaluate and fine-tune Sub-recommendations and Recommendations	R.I.	The Working Group evaluates each draft recommendation against the interest criteria and, where necessary, re-words them to reach consensus and to facilitate implementation.
11:30 am	Public Comment	R.I.	Provide public input into Working Group process.
12:00 pm	Adjourn		



Ruckelshaus Institute
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**Wyoming Game and Fish Department
Chronic Wasting Disease Working Group
Meeting 3, September 10-12, 2019
Community Center, Lander, WY**

**Evaluate Recommendations and Propose Implementation.
Last Workshop to Draft Recommendations.**

Meeting Objectives:

1. Evaluate Sub-recommendations and Final recommendations.
2. Rank short and long-term recommendations.
3. Discuss Implementation: Task Allocation

Tuesday, September 10			
Time	Agenda Item	Who	Product/Outcome
10:00	Welcome Working Group member introductions and agenda review	Co-Chairs Ruckelshaus Institute (R.I.)	Working Group members introduce themselves. Meeting agenda is approved. Discuss Objectives.
10:15	Approval Meeting Notes Constituency check-in	R.I.	Working Group: (1) reviews outcomes and actions since last meeting; (2) discusses communication with constituencies.
10:30	Outline and Process for Draft Plan Writing	WGFD	
11:00	Review of Working Group Recommendation Evaluations so far.	Jessica Western	Provide overview of Recommendation work so far.
11:15	Putting it all Together: Evaluate Recommendations	R.I.	The Working Group evaluates each draft recommendation against the interest criteria and, where necessary, re-words them to reach consensus and to facilitate implementation.
12:00	Lunch		
12:30	Putting it all Together: Evaluate Recommendations		
2:00	Break		

2:15	Putting it all Together: Evaluate Recommendations		
3:30	Break		
3:45	Putting it all Together: Evaluate Recommendations		
5:00	Adjourn		
6:00	Informal meet & greet		Cowfish Restaurant

Wednesday, September 11

Time	Agenda Item	Who	Product/Outcome
8:00	Finish evaluation of Recommendations	R.I.	Continue evaluating recommendations. Rank recommendations based on timing.
9:30	Public Comment	Co-Chairs	
10:00	Break		
10:15	Final Consensus Building and Consensus Testing.	R.I.	Final review and testing for consensus. Where consensus cannot be reached, this will be so noted.
12:00	Lunch and visit with Chief of the Wildlife Division.		
12:30	Final Consensus Building and Consensus Testing.	R.I.	Final review and testing for consensus. Where consensus cannot be reached, this will be so noted.
1:30	Final Consensus Building and Consensus Testing.	R.I.	Final review and testing for consensus. Where consensus cannot be reached, this will be so noted.
2:00	Break		
2:15	Final Consensus Building and Consensus Testing.	R.I.	Final review and testing for consensus. Where consensus cannot be reached, this will be so noted.
5:00	Adjourn for the Day		

Thursday, September 12

Time	Agenda Item	Who	Product/Outcome
8:00	Public Comment	Co-Chairs R.I.	
8:30	Final Consensus Building and Consensus Testing.	R.I.	Final review and testing for consensus. Where consensus cannot be reached, this will be so noted.
10:00	Break		

10:15	Final review and final adjustments to Recommendations.	R.I.	Ensure all interests are met as much as possible and that recommendations are worded to facilitate implementation.
11:45	Wrap-up	R.I Co-chairs	Co-chairs adjourn the Working Group and report writing procedures are confirmed.
12:00	Adjourn		

Appendix E. Results of the Working Group: Draft Recommendations and Sub-recommendations for WGFD to use in their Draft CWD Management Plan, still subject to Public Review. The lower the total score the more consensus was reached (C= Consensus; M = Consensus with Major Reservation; N = No Consensus).

Recommendations and Sub-recommendations	Participants at Agreement Level 4 and 5	Total Score	Level of Consensus
RECOMMENDATION 1: REDUCTION OF ARTIFICIAL CONCENTRATIONS <i>We recommend WGFD takes action to reduce artificial points of concentrations.</i>	1: Garrett	50	M
1.1 We recommend the WY Legislature provide the WGF Commission the authority to regulate the intentional private feeding of wild cervids, unless otherwise specified in law or authorized by the WGFD.	0	32	C
1.2 We recommend WGFD collaborate at a local level to reduce artificial points of cervid concentrations where possible.	0	38	C
1.3 WGFD should work closely with local constituencies to eliminate artificial feeding and reduce density of cervids, unless otherwise specified in law or authorized by the WGFD.	0	41	C
1.4 WGFD will work collaboratively with public stakeholder working groups to evaluate feeding practices of elk at feed grounds where possible to reduce risk and minimize negative impacts on elk population.	4: Justin C. 5: Garrett, Larry, Kent	68	N
RECOMMENDATION 2: CERVID REMAINS <i>We recommend a multi-prong approach to addressing the proper disposal of cervid remains and carcasses.</i>	0	39	C
2.1 We recommend WGFD works with individuals/NGOs/businesses to facilitate proper disposal of cervid remains/carcasses through funding partnerships (e.g. through Adopt A Dumpster Program).	0	33	C
2.2 We recommend WGFD work with DEQ, local solid waste operators and WY DOT to properly dispose of carcasses statewide and provide information about proper disposal sites.	0	29	C

2.3 We recommend the WY legislature provide authorization for use of existing funds to be used by local solid waste operators to properly dispose of cervid remains to reduce CWD prion prevalence.	0	32	C
2.4 We recommend the WY Legislature provides statutory authority to the WGF Commission to regulate the use of cervid urine.	0	33	C
RECOMMENDATION 3: EDUCATION AND COMMUNICATION 3.1 We recommend WGFD create a thoroughly articulated and deliberate CWD communication plan. The first priority of this communication plan is to build public support to be able to implement the recommendations from the CWD Plan. This plan should target all stakeholders to include, but not limited to: general public, hunters, hunter education, travel & tourism (chambers), meat processors, taxidermists, outfitters, landowners, state & federal agencies, tribal, and elected officials. The communication plan should address all CWD related issues including: transportation (interstate and intrastate) & disposal of carcasses (e.g. Quarter & Go), CWD pathology basics, artificial point sources, transmission, potential management strategies, importance of testing, human health, surveillance, up to date science, not feeding wildlife and the implication feeding has with spreading CWD and the essential role of hunting in disease management, unknowns, etc. Pursue this outreach plan with local organizations and NGOs. This communication plan needs to be very carefully thought through in order to avoid misperceptions. Involve all working group members. WGFD will create materials that are easily usable by other entities and organizations.	0	39	C
3.2 We recommend WGFD explore hiring a third-party communications contractor to help implement the outreach plan.	1: Josh	41	M
RECOMMENDATION 4: HABITATS AND CWD <i>Combine habitat management and research to support cervid health.</i>	0	32	C

4.1 Incorporate CWD consideration in WGFD's Strategic Habitat Plan to improve habitat and promote better distribution of cervids.	0	39	C
RECOMMENDATION 5: CERVID AND CWD MANAGEMENT ACTIONS <i>We recommend the Department consider experimental application of CWD suppression strategies utilizing an adaptive management framework with consideration to the "WAFWA Recommendations for Adaptive Management of CWD in the West" (Link doc) document. Management strategies should be implemented for a minimum of 10 years with a robust monitoring program to estimate prevalence with statistically significant sample sizes at least every 5 years. This would support a regional effort to gather valuable data to contribute to broader understanding of CWD suppression strategies. All management recommendations generated by this working group should be considered for experimental application and evaluation under this framework.</i>	0	46	C
5.1 Research suggests the greatest potential for successful CWD management actions occurs when prevalence is low. Therefore, CWD management is recommended at all prevalence levels, but local options to implement more aggressive management should be pursued once statistically valid prevalence reaches/exceeds 5%.	5: Larry	50	N
5.2: Specific management decisions should be determined at the local level and tailored to the population unit. Ensure education and outreach in order to gain and maintain public support for the CWD management actions. The following management recommendations are supported by this working group and should be considered either alone or in combination.	4: Garret, Larry	45	M











5.2 Option 1: Increase mature buck harvest in order to lower CWD prevalence from current levels by a percentage deemed appropriate through local processes and with consideration to the WAFWA Document https://www.wafwa.org/Documents%20and%20Settings/37/Site%20Documents/Committees/Wildlife%20Health/docs/CWDAdaptiveManagementRecommendations_WAFWAfinal_approved010618.pdf .	5: Larry, Kent	67	N
5.2 Option 2: Alter the timing of buck harvest in order to increase harvest of mature bucks. E.g. taking advantage of seasonal behaviors	0	46	C
5.2 Option 3: Reduce cervid populations to measurably decrease densities within an area of concern (e.g. herd unit, hunt area, portion of a hunt area). Maintain reduced densities for the appropriate amount of time to adequately evaluate effects on CWD (i.e. greater than 10 years). This may require a sustained increase in female harvest. Density and harvest goals must be clearly articulated and developed with public input prior to and during implementation.	0	54	C
5.2 Option 4: Where possible, reduce areas of artificial concentration of cervids (feed, mineral, salt, water etc.) by working with landowners, producers, local, state and federal agencies.	4: Sy, Garrett	51	M
5.2 Option 5: Utilize a robust monitoring program to identify areas with a high density of CWD positive cervids (i.e. “hot spots”). Develop and implement lethal removal strategies to maximize removal of cervids (male and female) around locations of known “hot spots”, including but not limited to hunter harvest (preferred), targeted agency removal, and other designated methods.	0	43	C






5.3 Encourage a multifaceted approach to use experimental design or management strategies to reduce CWD prevalence. Acknowledge relative study time frames and need for continually engaging the public to gain informed support.	0	46	C
5.4 WGFD will consider CWD in the adjustment of harvest and population objectives and associated management strategies to manage cervid numbers (male & female) in areas of concern.	0	37	C
5.5 Utilize a combination of voluntary and mandatory testing in areas where specific CWD management is being applied in order to obtain statistically valid sample sizes to evaluate the efficacy of any such management strategy.	0	38	C
5.6 Develop an adaptive monitoring plan based on prescribed management for a time frame of 10 years (to be assessed at 5-year intervals) for all cervids.	0	45	C
5.7 Consider options to refund license fees for cervids that test CWD positive in areas where an experimental management strategy is in place.	4: Justin, Steve R., Millie, Rick, Kent 5: Larry, Sy, Ambrosia	92	N
5.8 We recommend WGFD cooperate with landowners to increase hunter access for CWD management.	0	44 C	C
RECOMMENDATION 6.0: CWD AND MIGRATORY HERDS <i>We recommend that management actions are implemented in migratory cervid herds to reduce disease transmission risk and keep CWD prevalence at low or reduced levels.</i>	0	35	C
6.1 Support systematic monitoring across the state to detect “hot spots” and CWD prevalence information.	0	41	C
6.2 Consider issuing licenses and associated hunting seasons in relation to migratory herds that are intended to specifically address CWD management actions.	0	57	C





RECOMMENDATION 7.0: SURVEILLANCE & MONITORING <i>Support surveillance efforts necessary to detect changes in CWD prevalence. Use sample sizes collected over a maximum of a 3-year time frame as per the WGFD-CWD Surveillance Plan (Link doc).</i>	0	31	C
7.1 Utilize various licensing options to increase sample size in hunt areas where statistically significant sample sizes are needed (i.e. increased reduced price license/female harvest, late season, etc.).	0	46	C
7.2 WGFD to create non-monetary incentives to increase CWD sample sizes where needed.	0	35	C
7.3 Analyze & mine data for population and disease demographic information including male:female ratio, gender specific disease prevalence, survival rates, pre and post management.	0	40	C
7.4 Pursue increased funding to support testing, monitoring and additional laboratory capacity.	0	36	C
RECOMMENDATION 8: RESEARCH <i>We recommend the WGFD enhance its CWD research and testing capacity by diverse means to enable science-based cervid management.</i>	0	37	C
8.1 Continue to rigorously pursue collaborative genetic research programs with state and federal agencies, universities and private entities to better understand the role genetics plays in CWD in cervid populations and potential management implications. This should include, but not be limited to: monitoring frequency of genotypes in cervid populations and the fitness traits associated with these genotypes	0	29	C






8.2 We recommend WGFD pursue research (e.g. a survey) to determine public attitudes on CWD.	4: Larry, Josh, Tony	55	M
8.3 Investigate the relative importance of direct vs. indirect transmission of CWD prions	0	35	C
8.4 Assist in the validation of experimental assays for CWD prion detection (e.g. PMCA, rt-quic, and field testing).	0	43	C
8.5 Evaluate regional differences in CWD dynamics.	0	43	C
8.6 Pursue funding for collaborative CWD research and management efforts. Explore funding sources including but not limited to: private, non-profits, general state funds, grants, federal sources, CWD management stamp, non-consumptive users, WY Governor's Big Game License Coalition, Commissioner's license.	0	42	C
8.7 We recommend WGFD explore the possibility of creating an additional dedicated license with revenue specifically ear marked for CWD research and management.	4: Nick, Dan S., Andy, Laura, Kristen, Justin, Libby, Millie, Rick, Kent. 5: Larry, Bruce, Steve, Josh, Sy, Ambrosia	99	N
8.8 Incorporate CWD data collection into current and future research where appropriate.	0	33	C
8.9 Evaluate the effect of predators/large carnivores at a local level on CWD prevalence, transmission, and management implications.	4: Ambrosia, Larry, Kent 5: Sy	53	N
8.10 Begin a research project at feed, mineral, water, and salt sites working with willing landowners to explore techniques to reduce CWD transmission.	0	48	C








8.11 We recommend WGFD collaborate on research on how environmental prion contamination correlates with disease prevalence and transmission.	0	43	C
8.12 Conduct field studies to determine if artificial cervid aggregation is increasing CWD prevalence (e.g. underpasses/overpasses, water holes, feed grounds, etc).	4: Kent, Larry, Laura 5: Millie, Sy, Ambrosia	81	N
8.13 Pursue habitat research on CWD to include: 1) How cervid habitat selection affects CWD prevalence, 2) How habitat improvements affect population demographics and distribution in the face of CWD	0	45	C
8.14 We recommend WGFD continue to collaborate nationally and internationally regarding CWD strategies and management actions and associated outcomes and research - in order to adaptively manage CWD.	0	34	C
8.15 We recommend WGFD collaborate in research and evaluation of a CWD vaccine.	2: Laura, Brant	44	M
8.16 Study the effects of competition among cervid species on CWD prevalence.	1: Larry	57	M
Recommend the WY Dept. of Health and WY Dept. Agriculture work with pertinent stakeholder groups to develop recommendations for meat processes.	0	41	C
Recommend the WY Dept. of Health and WY Dept. Agriculture work with pertinent stakeholder groups to develop recommendations for safe donation of game meat.	0	40	C








Appendix C – CWD Working Group Recommendations RECOMMENDATIONS and SUBRECOMMENDATIONS			Did the Wyoming Game and Fish incorporate recommendation into the Wyoming CWD Management Plan?
	YES	NO	Comments
RECOMMENDATION 1: REDUCTION OF ARTIFICIAL CONCENTRATIONS We recommend WGFD takes action to reduce artificial points of concentrations.			
1.1 We recommend the WY Legislature provide the WGF Commission the authority to regulate the intentional private feeding of wild cervids, unless otherwise specified in law or authorized by the WGFD.			Disease Management Strategies; Artificial Sources of Cervid Concentration
1.2 We recommend WGFD collaborate at a local level to reduce artificial points of cervid concentrations where possible.			Disease Management Strategies; Artificial Sources of Cervid Concentration
1.3 WGFD should work closely with local constituencies to eliminate artificial feeding and reduce density of cervids, unless otherwise specified in law or authorized by the WGFD.			Disease Management Strategies; Artificial Sources of Cervid Concentration
1.4 WGFD will work collaboratively with public stakeholder working groups to evaluate feeding practices of elk at feed grounds where possible to reduce risk and minimize negative impacts on elk population.			Elk Feedgrounds
RECOMMENDATION 2: CERVID REMAINS We recommend a multi-prong approach to addressing the proper disposal of cervid remains and carcasses.			
2.1 We recommend WGFD works with individuals/NGOs/businesses to facilitate proper disposal of cervid remains/carcasses through funding partnerships (e.g. through Adopt A Dumpster Program).			Disease Management Strategies; Additional Regulatory and Agency Actions
2.2 We recommend WGFD work with DEQ, local solid waste operators and WY DOT to properly dispose of carcasses statewide and provide information about proper disposals sites.			Disease Management Strategies; Additional Regulatory and Agency Actions
2.3 We recommend the WY legislature provide authorization for use of existing funds to be used by local solid waste operators to properly dispose of cervid remains to reduce CWD prion prevalence.			Disease Management Strategies; Additional Regulatory and Agency Actions
2.4 We recommend the WY Legislature provides statutory authority to the WGF Commission to regulate the use of cervid urine.			Disease Management Strategies; Additional Regulatory and Agency Actions










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	YES	NO	Comments
RECOMMENDATION 3: EDUCATION AND COMMUNICATION			
3.1 We recommend WGFD create a thoroughly articulated and deliberate CWD communication plan. The first priority of this communication plan is to build public support to be able to implement the recommendations from the CWD Plan. This plan should target all stakeholders to include, but not limited to: general public, hunters, hunter education, travel & tourism (chambers), meat processors, taxidermists, outfitters, landowners, state & federal agencies, tribal, and elected officials. The communication plan should address all CWD related issues including: transportation (interstate and intrastate) & disposal of carcasses (e.g. Quarter & Go), CWD pathology basics, artificial point sources, transmission, potential management strategies, importance of testing, human health, surveillance, up to date science, not feeding wildlife and the implication feeding has with spreading CWD and the <u>essential</u> role of hunting in disease management, unknowns, etc. Pursue this outreach plan with local organizations and NGOs. This communication plan needs to be very carefully thought through in order to avoid misperceptions. Involve all working group members. WGFD will create materials that are easily usable by other entities and organizations.			CWD Communication and Outreach
3.2 We recommend WGFD explore hiring a third party communications contractor to help implement the outreach plan.			While not specifically mentioned in the Plan, this recommendation will be explored in the development of the CWD Communication and Implementation Plan.
RECOMMENDATION 4: HABITATS AND CWD Combine habitat management and research to support cervid health.			
4.1 Incorporate CWD consideration in WGFD's Strategic Habitat Plan to improve habitat and promote better distribution of cervids.			Disease Management Strategies; Artificial Sources of Cervid Concentration











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	YES	NO	Comments
RECOMMENDATION 5: CERVID AND CWD MANAGEMENT ACTIONS We recommend the Department consider experimental application of CWD suppression strategies utilizing an adaptive management framework with consideration to the “WAFWA Recommendations for Adaptive Management of CWD in the West” (Link doc) document. Management strategies should be implemented for a minimum of 10 years with a robust monitoring program to estimate prevalence with statistically significant sample sizes at least every 5 years. This would support a regional effort to gather valuable data to contribute to broader understanding of CWD suppression strategies. All management recommendations generated by this working group should be considered for experimental application and evaluation under this framework.			Disease Management Strategies
5.1 Research suggests the greatest potential for successful CWD management actions occurs when prevalence is low. Therefore, CWD management is recommended at all prevalence levels, but local options to implement more aggressive management should be pursued once statistically valid prevalence reaches/exceeds 5%.			The Plan specifically recommends CWD management occur at all prevalence levels, although the 5% threshold is not in the plan. However, the Plan does state (within Hunter Harvest Management section), “The Department will assess if CWD prevalence thresholds are appropriate to use as a trigger to require variable management considerations. Should prevalence thresholds be integrated into routine management recommendations, prevalence data used must be based on adequate sample size and distribution within a given herd unit.”
5.2 Specific management decisions should be determined at the local level and tailored to the population unit. Ensure education and outreach in order to gain and maintain public support for the CWD management actions. The following management recommendations are supported by this working group and should be considered either alone or in combination.			Disease Management Strategies

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	YES	NO	Comments
Option 1: Increase mature buck harvest in order to lower CWD prevalence from current levels by a percentage deemed appropriate through local processes and with consideration to the WAFWA Document (LINK doc).			Disease Management Strategies; Hunter Harvest Management
Option 2: Alter the timing of buck harvest in order to increase harvest of mature bucks. E.g. taking advantage of seasonal behaviors.			Disease Management Strategies; Hunter Harvest Management
Option 3: Reduce cervid populations to measurably decrease densities within an area of concern (e.g. herd unit, hunt area, portion of a hunt area). Maintain reduced densities for the appropriate amount of time to adequately evaluate effects on CWD (i.e. greater than 10 years). This may require a sustained increase in female harvest. Density and harvest goals must be clearly articulated and developed with public input prior to and during implementation.			Disease Management Strategies; Hunter Harvest Management
Option 4: Where possible, reduce areas of artificial concentration of cervids (feed, mineral, salt, water etc.) by working with landowners, producers, local, state and federal agencies.			Disease Management Strategies; Artificial Sources of Cervid Concentration
Option 5: Utilize a robust monitoring program to identify areas with a high density of CWD positive cervids (i.e. “hot spots”). Develop and implement lethal removal strategies to maximize removal of cervids (male and female) around locations of known “hot spots”, including but not limited to hunter harvest (preferred), targeted agency removal, and other designated methods.			Disease Management Strategies; Hunter Harvest Management

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	YES	NO	Comments
5.3 Encourage a multifaceted approach to use experimental design or management strategies to reduce CWD prevalence. Acknowledge relative study time frames and need for continually engaging the public to gain informed support.			Disease Management Strategies
5.4 WGFD will consider CWD in the adjustment of harvest and population objectives and associated management strategies to manage cervid numbers (male & female) in areas of concern.			Disease Management Strategies; Hunter Harvest Management
5.5 Utilize a combination of voluntary and mandatory testing in areas where specific CWD management is being applied in order to obtain statistically valid sample sizes to evaluate the efficacy of any such management strategy.			Disease Management Strategies; Voluntary and Mandatory Sample Submission for CWD Management Actions
5.6 Develop an adaptive monitoring plan based on prescribed management for a time frame of 10 years (to be assessed at 5 year intervals) for all cervids.			This Plan repeatedly acknowledges the necessity to implement and monitor prescribed management strategies over long and sufficient timeframes for robust evaluation, with suggestions of “(i.e., ten years)” being used. The recommendation that management actions be specifically tailored to localized herd unit issues occurs within the Disease Management Strategy section, so it was unnecessary to describe definitive timeframes.
5.7 Consider options to refund license fees for cervids that test CWD positive in areas where an experimental management strategy is in place.			The Department will evaluate this recommendation if experimental hunter harvest management strategies are implemented and there is insufficient hunter participation due to an inability to receive a license refund if their harvested animal tests positive for CWD.
5.8 We recommend WGFD cooperate with landowners to increase hunter access for CWD management.			
RECOMMENDATION 6.0: CWD AND MIGRATORY HERDS We recommend that management actions are implemented in migratory cervid herds to reduce disease transmission risk and keep CWD prevalence at low or reduced levels.			Disease Management Strategies

Appendix C – CWD Working Group Recommendations RECOMMENDATIONS and SUBRECOMMENDATIONS	Did the Wyoming Game and Fish incorporate recommendation into the Wyoming CWD Management Plan?		
	YES	NO	Comments
6.1 Support systematic monitoring across the state to detect “hot spots” and CWD prevalence information.			Disease Management Strategies; Artificial Sources of Cervid Concentration
6.2 Consider issuing licenses and associated hunting seasons in relation to migratory herds that are intended to specifically address CWD management actions.			Disease Management Strategies
RECOMMENDATION 7.0: SURVEILLANCE & MONITORING Support surveillance efforts necessary to detect changes in CWD prevalence. Use sample sizes collected over a maximum of a 3-year time frame as per the WGFD-CWD Surveillance Plan (Link doc).			
7.1 Utilize various licensing options to increase sample size in hunt areas where statistically significant sample sizes are needed (i.e. increased reduced price license/female harvest, late season, etc.).			The Plan acknowledges that statistically valid sample sizes may not be obtained in some herd units due to logistical issues or harvest regimes. It does not state that we will specifically alter hunting season framework (e.g., license types/quotas) merely to achieve more CWD samples.
7.2 WGFD to create non-monetary incentives to increase CWD sample sizes where needed.			While non-monetary incentives are not explicitly mentioned in this Plan, Recommendation 7.2 will be addressed in the CWD Communication and Implementation Plan. This recommendation is similar to current strategies the Department has in place for brucellosis testing.
7.3 Analyze & mine data for population and disease demographic information including male:female ratio, gender specific disease prevalence, survival rates, pre and post management.			This is part of an ongoing effort with multiple western states and Alberta. Additional work was done on this in October 2019. This will also be further addressed by requiring WGFD biologists to discuss CWD issues and available data in annual Job Completion Reports and formal objective reviews.
7.4 Pursue increased funding to support testing, monitoring and additional laboratory capacity.			Disease Management Strategies; Additional Agency and Regulatory Actions
RECOMMENDATION 8: RESEARCH We recommend the WGFD enhance its CWD research and testing capacity by diverse means to enable science-based cervid management.			

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	YES	NO	Comments
8.1 Continue to rigorously pursue collaborative genetic research programs with state and federal agencies, universities and private entities to better understand the role genetics plays in CWD in cervid populations and potential management implications. This should include, but not be limited to: monitoring frequency of genotypes in cervid populations and the fitness traits associated with these genotypes			Research and Coordination
8.2 We recommend WGFD pursue research (e.g. a survey) to determine public attitudes on CWD.			The Department has not committed to conducting a public attitude survey of the general public. For the purposes of this Plan and communication strategies to follow, the Department will rely on information gathered from the 2019 Hunter Perspective Survey and input received through the CWD Collaborative Process.
8.3 Investigate the relative importance of direct vs. indirect transmission of CWD prions			Research and Coordination
8.4 Assist in the validation of experimental assays for CWD prion detection (e.g. PMCA, rt-quic, and field testing).			Research and Coordination
8.5 Evaluate regional differences in CWD dynamics.			Research and Coordination
8.6 Pursue funding for collaborative CWD research and management efforts. Explore funding sources including but not limited to: private, non-profits, general state funds, grants, federal sources, CWD management stamp, non-consumptive users, WY Governor’s Big Game License Coalition, Commissioner's license.			While this statement is not specifically included in this Plan, the Department will pursue funding from multiple sources for CWD research as projects are identified.
8.7 We recommend WGFD explore the possibility of creating an additional dedicated license with revenue specifically ear marked for CWD research and management.			There was strong non-consensus from the CWD Working Group for this recommendation. In addition, significant public opposition has been expressed regarding other special or “set aside” licenses. Finally, there is concern with the precedent of developing special licenses that are earmarked for funding specific purposes.
8.8 Incorporate CWD data collection into current and future research where appropriate.			Research and Coordination and Disease Management Strategies

Appendix C – CWD Working Group Recommendations RECOMMENDATIONS and SUBRECOMMENDATIONS			Did the Wyoming Game and Fish incorporate recommendation into the Wyoming CWD Management Plan?
	YES	NO	Comments
8.9 Evaluate the effect of predators/large carnivores at a local level on CWD prevalence, transmission, and management implications.			Research and Coordination
8.10 Begin a research project at feed, mineral, water, and salt sites working with willing landowners to explore techniques to reduce CWD transmission.			Research and Coordination and Disease Management Strategies; Artificial Sources of Cervid Concentration
8.11 We recommend WGFD collaborate on research on how environmental prion contamination correlates with disease prevalence and transmission.			Research and Coordination
8.12 Conduct field studies to determine if artificial cervid aggregation is increasing CWD prevalence (e.g. underpasses/overpasses, water holes, feed grounds, etc).			Research and Coordination
8.13 Pursue habitat research on CWD to include: 1) How cervid habitat selection affects CWD prevalence, 2) How habitat improvements affect population demographics and distribution in the face of CWD			Research and Coordination
8.14 We recommend WGFD continue to collaborate nationally and internationally regarding CWD strategies and management actions and associated outcomes and research - in order to adaptively manage CWD.			Research and Coordination
8.15 We recommend WGFD collaborate in research and evaluation of a CWD vaccine.			Research and Coordination
8.16 Study the effects of competition among cervid species on CWD prevalence.			Research and Coordination
9.1 Recommend the WY Dept. of Health and WY Dept. Agriculture work with pertinent stakeholder groups to develop recommendations for meat processors.			Disease Management Strategies; Artificial Sources of Cervid Concentration
9.2 Recommend the WY Dept. of Health and WY Dept. Agriculture work with pertinent stakeholder groups to develop recommendations for donation of game meat.			Human Health and CWD

Appendix D - Hunter Perspective Survey

2019 Hunter Perspective Survey

From February through April of 2019, the Department surveyed both resident and nonresident deer hunters to garner insight on hunter perspectives regarding CWD in deer in Wyoming. Colorado Parks and Wildlife conducted a similar survey, and the Department intends to compare results from both states to provide a broader understanding of hunter perspectives on CWD. The purpose of this survey was to learn what resident and nonresident hunter interests are in relation to CWD, their potential concerns regarding this disease, and the ways the Department might effectively manage impacted deer herds in the state.

A sample of 3,000 deer hunters received the survey, including 2,000 resident and 1,000 nonresident hunters. Hunters were selected from respondents to the 2017 and 2018 Wyoming Game and Fish Department deer harvest survey, allowing both limited quota and general license holders who reported hunting in areas with known high or low CWD prevalence to be surveyed. Hunt areas with CWD prevalence of 5% or less were considered low prevalence areas, while those with at least 10% CWD prevalence were considered high prevalence areas. A total of 1,201 hunters (622 from high prevalence hunt areas and 579 from low prevalence hunt areas; 751 residents and 450 nonresidents) responded to the survey. Hunters surveyed were contacted by email initially but were then sent a paper copy if they did not respond to the email survey.

Results from the survey were considered during the development of this revised Plan. In addition, hunter perspectives inform Department communication strategies by providing valuable insight into what information is most important to the hunting public. Similar future surveys may also be conducted to gauge shifts in hunter perspectives regarding CWD over time. A copy of the survey and a summary of responses to relevant questions follows.

Key preliminary results from this survey were:

- A relative majority of hunters (48% high CWD prevalence [HCWD] group, 45% low CWD prevalence [LCWD] group) do not agree that concerns about CWD have been exaggerated, and a large majority (82% HCWD group, 78% LCWD group) agree that effort should be taken to reduce the rate of infection in deer.
- A majority of hunters are very concerned about the health of affected deer herds (59% HCWD group, 58% LCWD group), the potential for CWD to reduce deer hunting opportunity (61% HCWD group, 59% LCWD group), and future generation's ability to enjoy deer hunting (61% HCWD group, 58% LCWD group).
- Surveyed hunters were presented with three scenarios tailored to the high or low CWD prevalence of the original hunt area in which they hunted: one in which CWD prevalence stayed about the same; one in which CWD prevalence approximately doubled; and one in which CWD prevalence increased by approximately four to five times.
 - Under all three scenarios, a large majority (more than 80%) of hunters are likely to support taking measures to control CWD.
 - The proportion of hunters likely to look for alternative areas to hunt increased as

theoretical CWD prevalence increased.

- A majority (more than 50%) of hunters indicated they are very unlikely to stop hunting for deer in Wyoming under all three scenarios.
- A majority of deer carcasses in Wyoming are either disposed of in the trash or landfill (28% HCWD group, 25% LCWD group), or edible meat was removed and the remaining carcass left in the field (34% HCWD group, 37% LCWD group).
- About 20% of hunters are unaware of carcass transportation regulations.
- About 65% of the HCWD group and 64% of the LCWD group reported harvesting a deer during the 2017 or 2018 hunting season. Of the HCWD group, 10% reported having ever harvested a CWD-positive deer versus <2% from the LCWD group.
- The most acceptable CWD control management action among hunters was the use of special management hunts to remove deer in localized areas of especially high prevalence with minimum impact on overall deer numbers. This was followed by using hunters to reduce the total deer population (bucks and does) and then by increasing the numbers of buck licenses available during later seasons in affected hunt areas.
- Taking no action and letting CWD take its natural course was the most unacceptable management action among a majority of hunters (74% HCWD group, 75% LCWD group).
- A majority of hunters indicate striking a balance between controlling CWD and preserving hunting opportunities should be a priority for the Department (82% HCWD group, 84% LCWD group).
- The Department's website is currently the best available and preferred resource from which hunters get information about CWD. For all hunters, the Department's website and hunting regulation brochures are the top two preferred methods of getting information about CWD. However, for hunters under 50 years of age, social media is the top third preferred method while hunting magazines are the top third preference for hunters over 50 years of age.

Preliminary Results

Survey Response Summary:

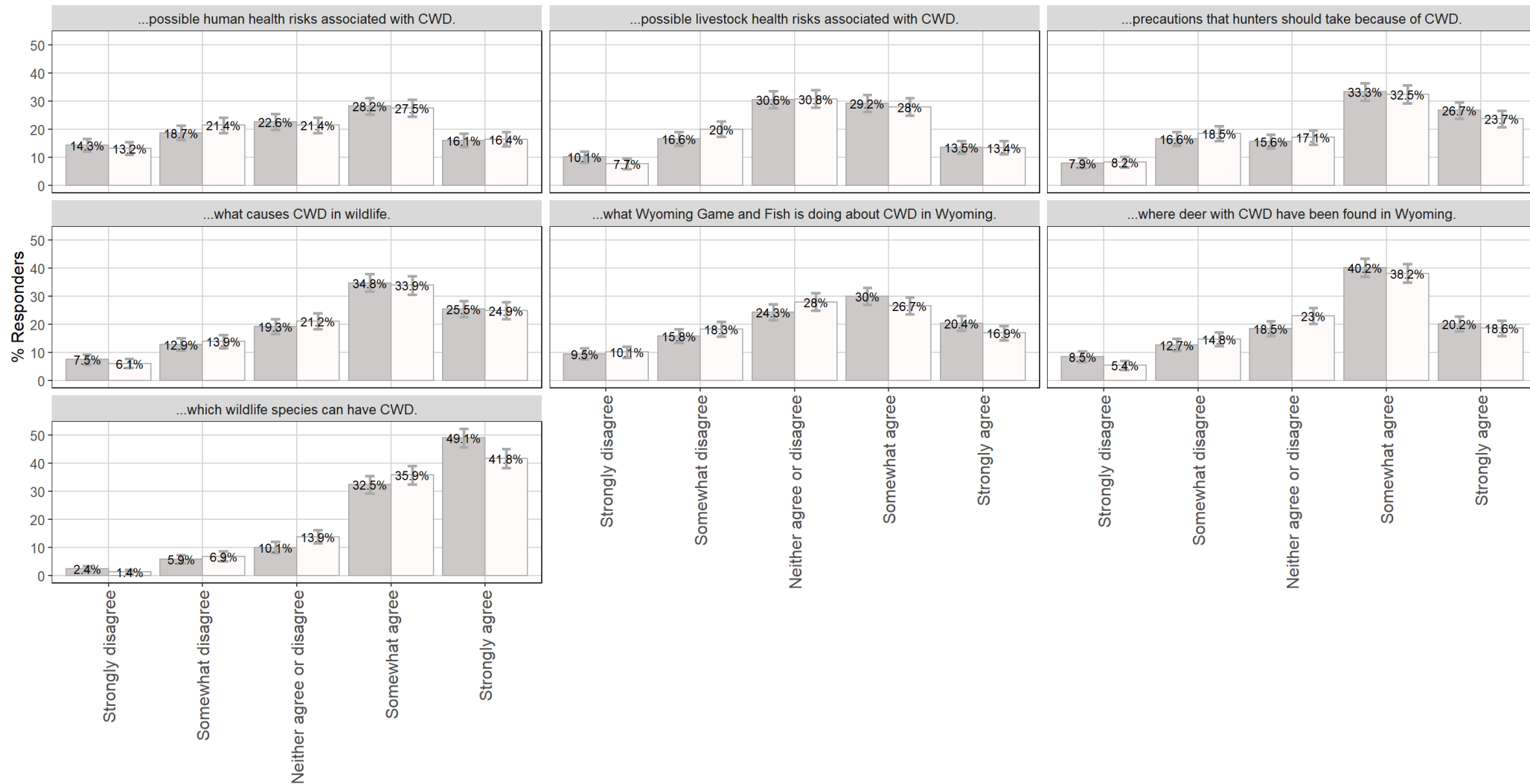
CWD Prevalence	Residency	# Responded	Response Rate
High	NR	243	48.6%
High	R	379	37.9%
Low	NR	207	41.4%
Low	R	372	37.2%
Total	Total	1201	40.0%

I feel I have enough information about...

Figure Legend

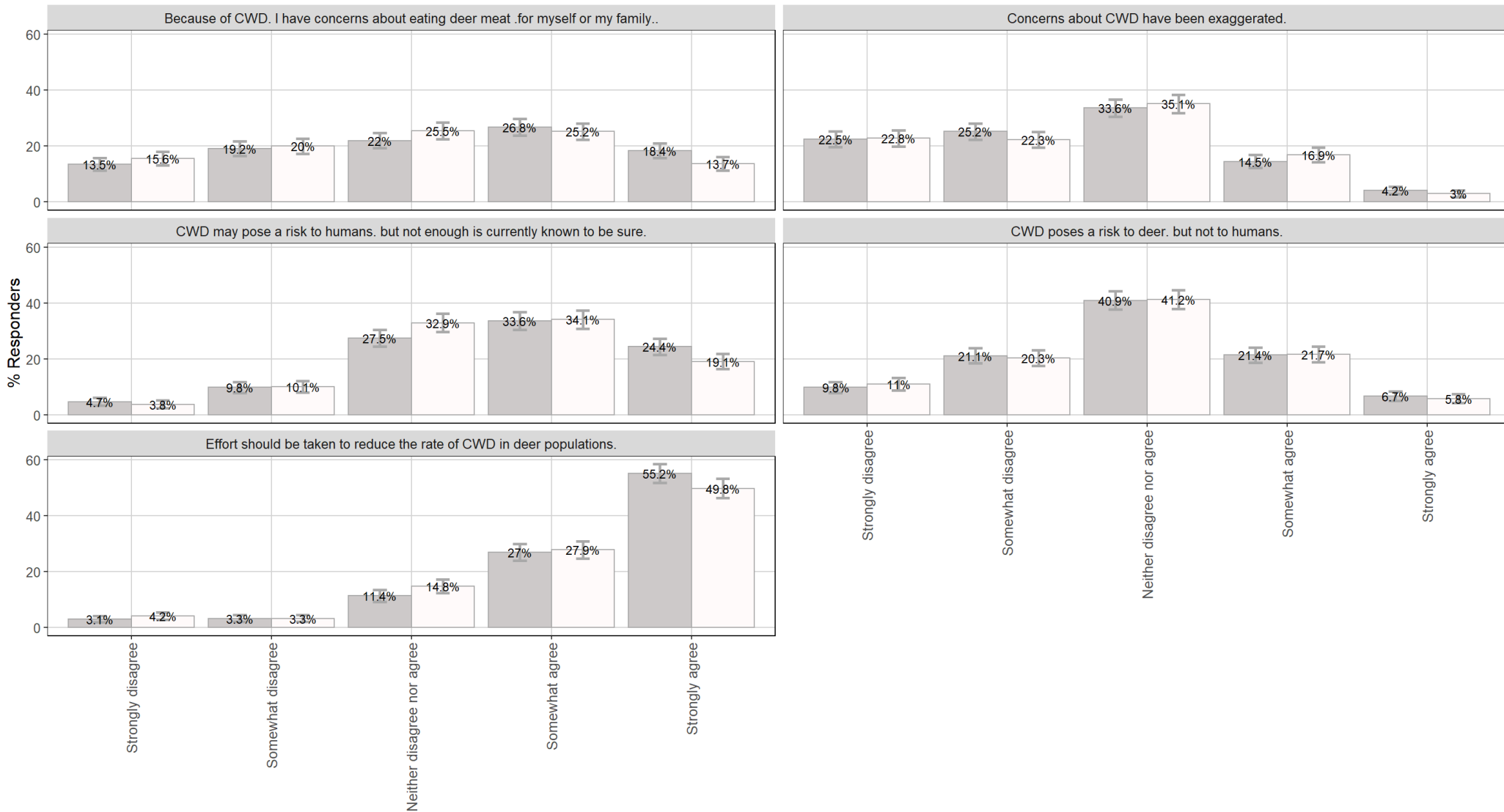
CWD Prevalence Group

High Low

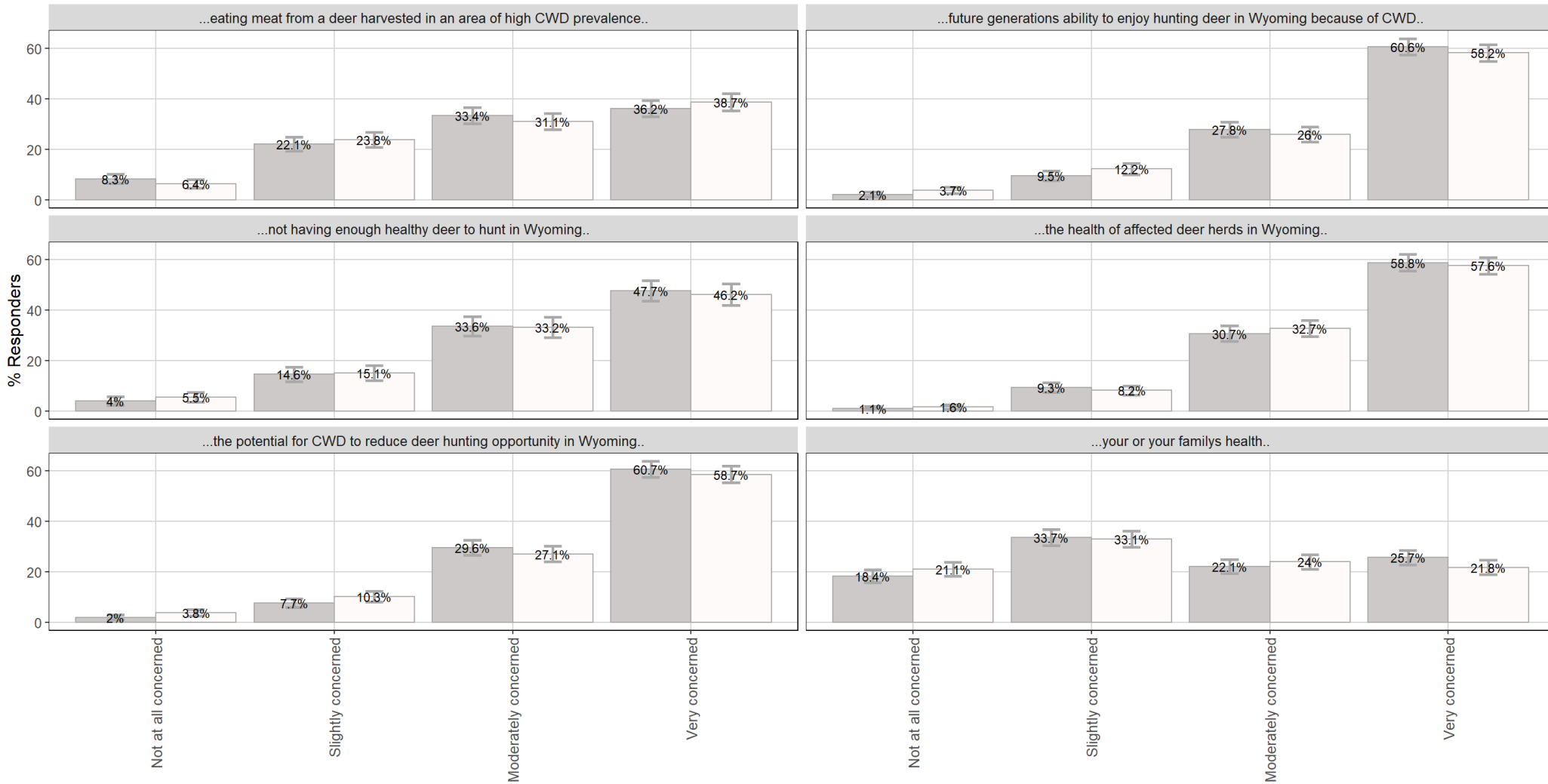


Note: All error bars are 90% MOE for “% Responders” within the “High” sample group or “Low” sample group.

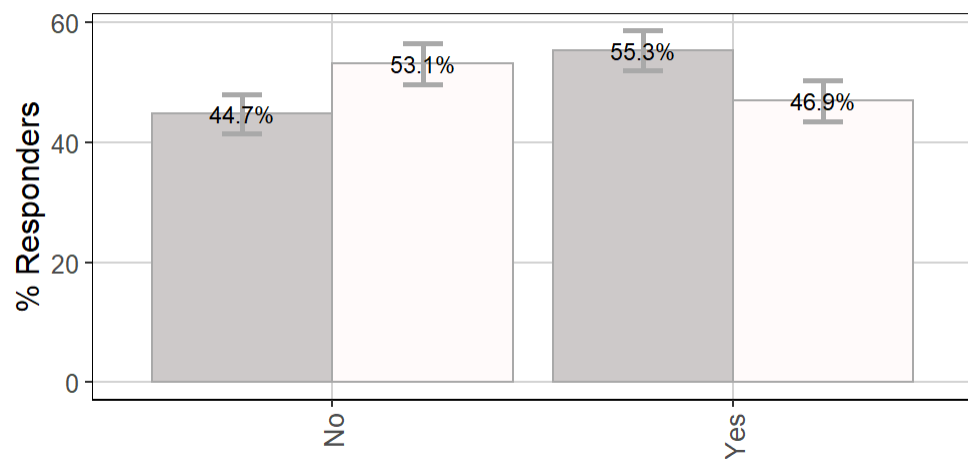
Because of CWD do you agree or disagree with the following statements?



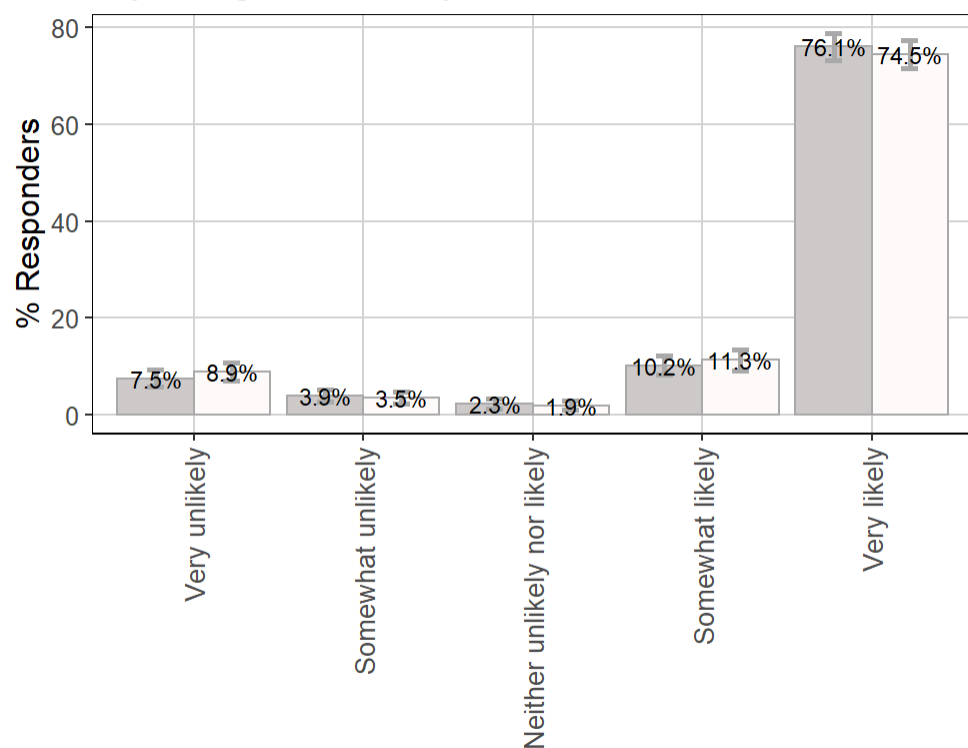
Because of CWD in deer, how concerned are you about each of the following?



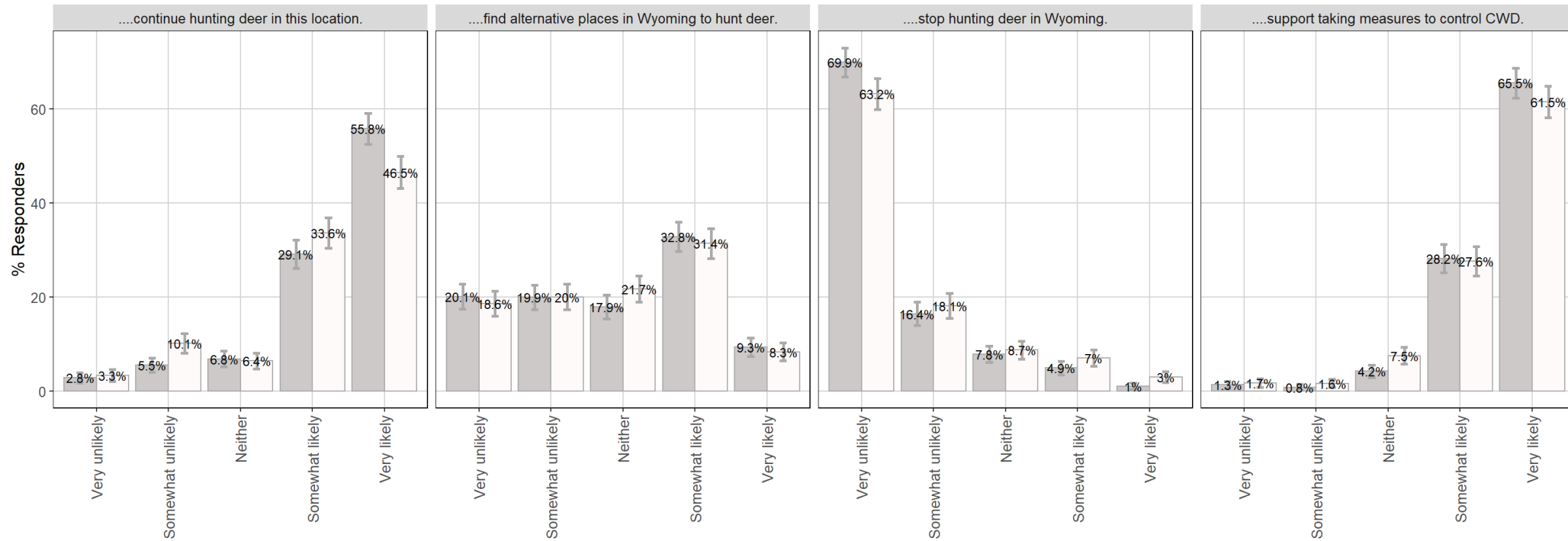
Were you aware of the CWD prevalence in your hunt area?



How likely are you to hunt in Wyoming the next 3 years?



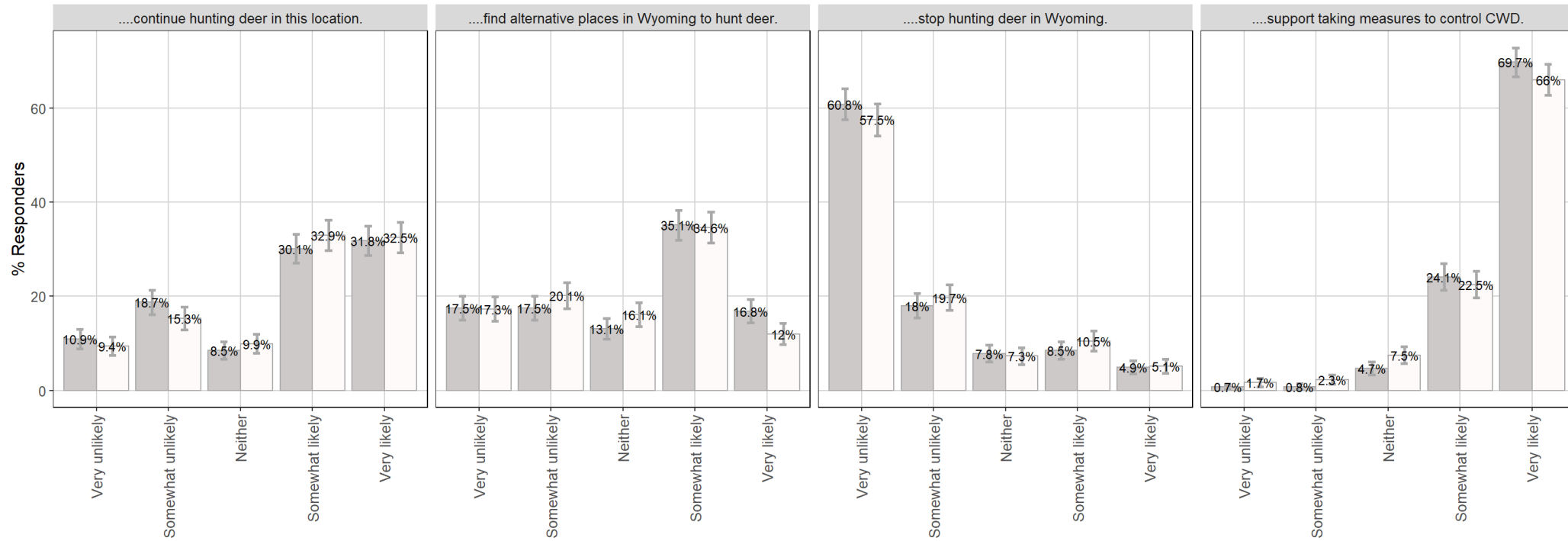
High CWD Prevalence: Given prevalence of at least 10%,
 Low CWD Prevalence: If prevalence were at least 5%,
 How likely are you to...



High CWD Prevalence: If prevalence were at least 20%

Low CWD Prevalence: If prevalence were at least 10%

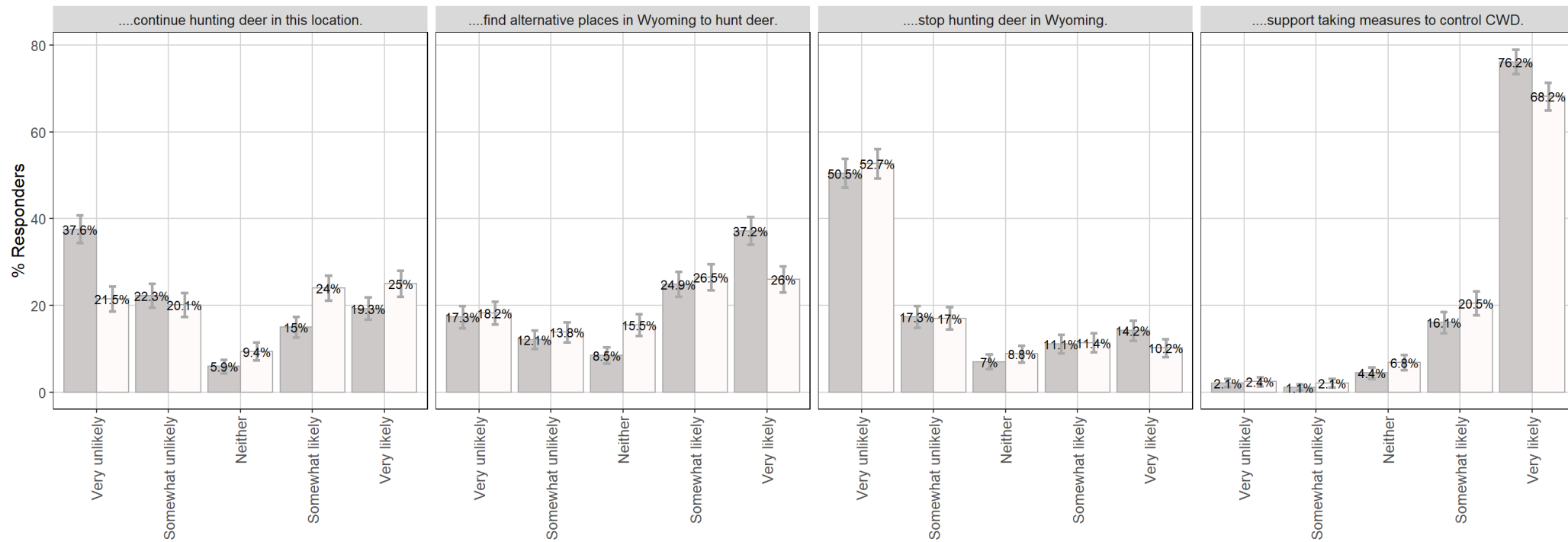
How likely are you to...



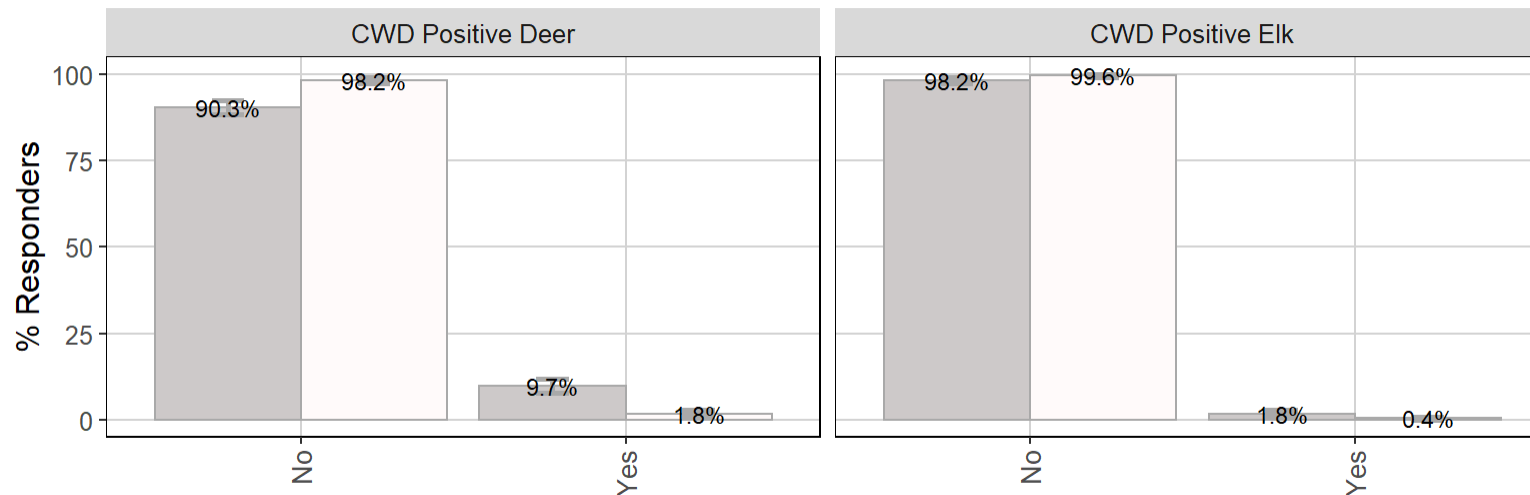
High CWD Prevalence: If prevalence were at least 50%

Low CWD Prevalence: If prevalence were at least 20%

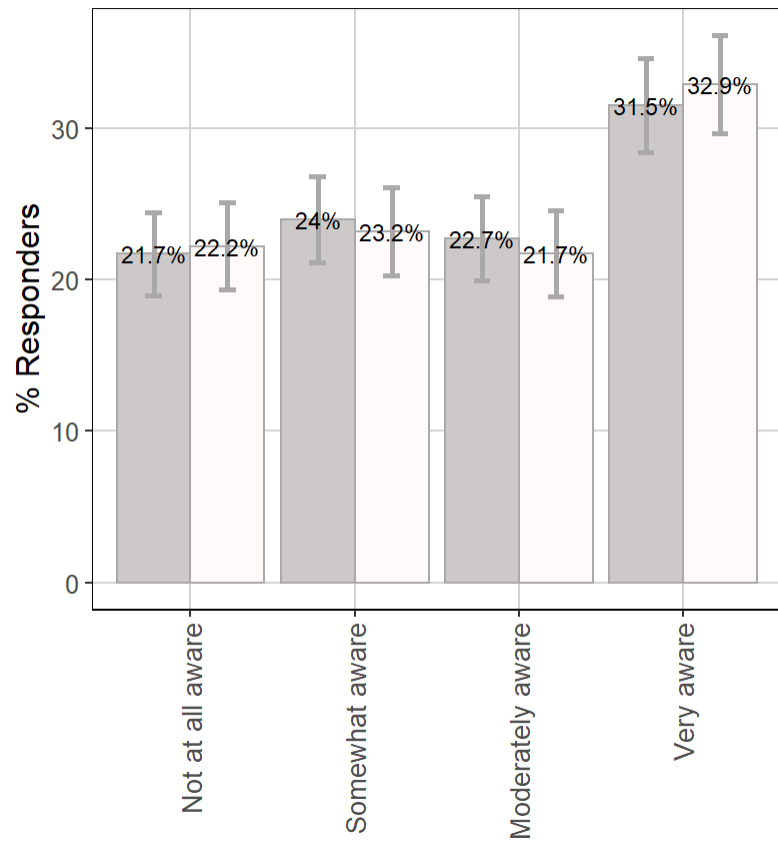
How likely are you to...



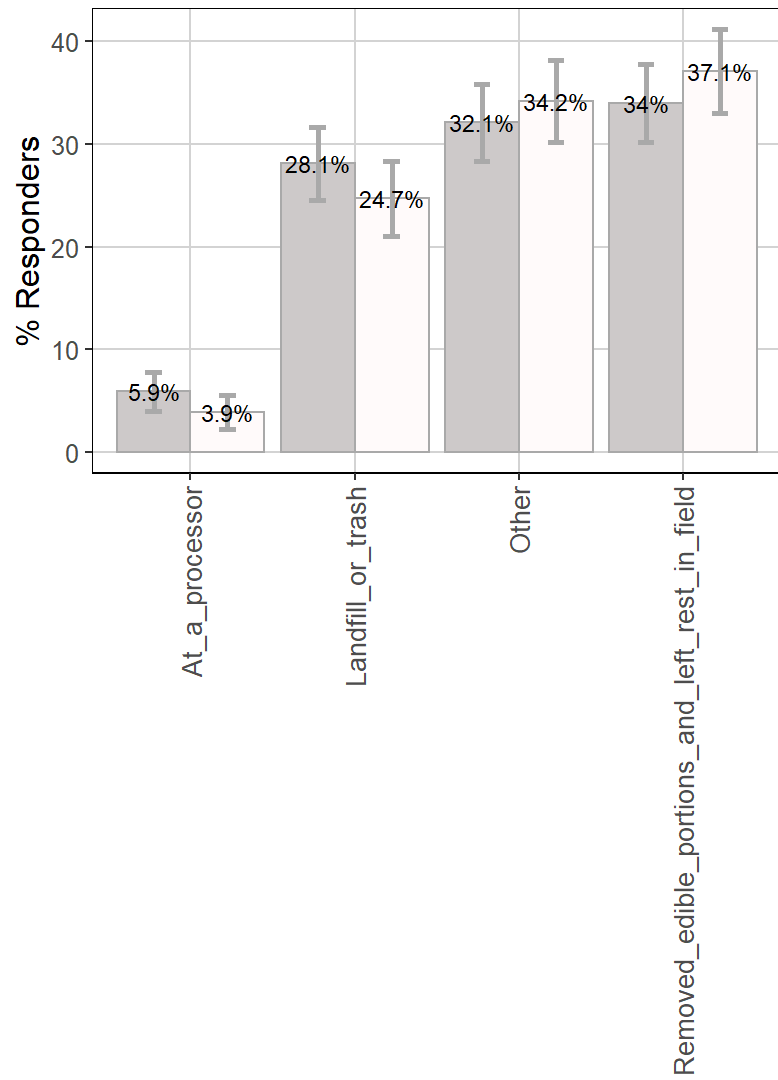
Have you ever harvested a...



How aware are you of carcass transportation regulations?

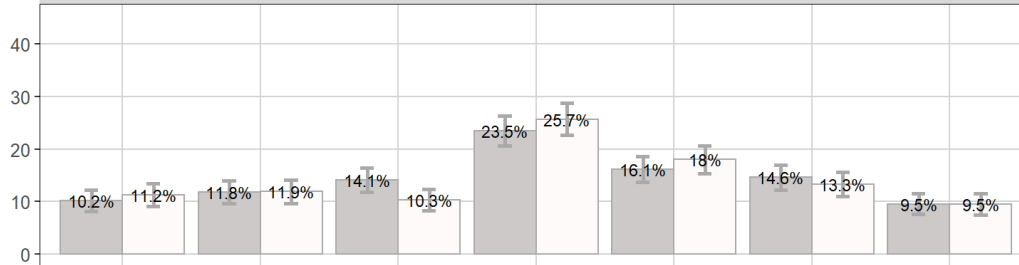


How do you dispose of carcasses?

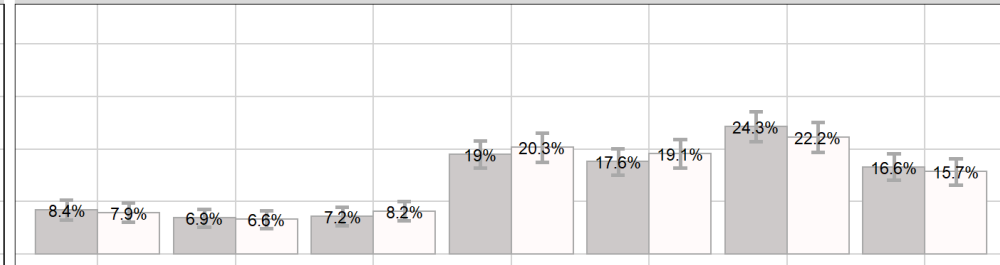


How acceptable would it be for WGFD to...

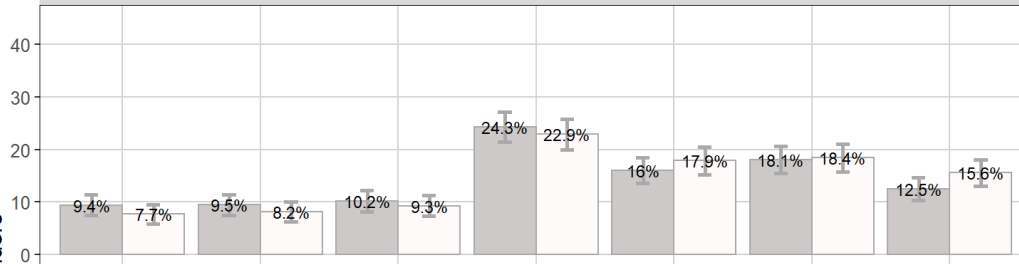
...increase the number of buck hunting licenses during existing hunting seasons. .



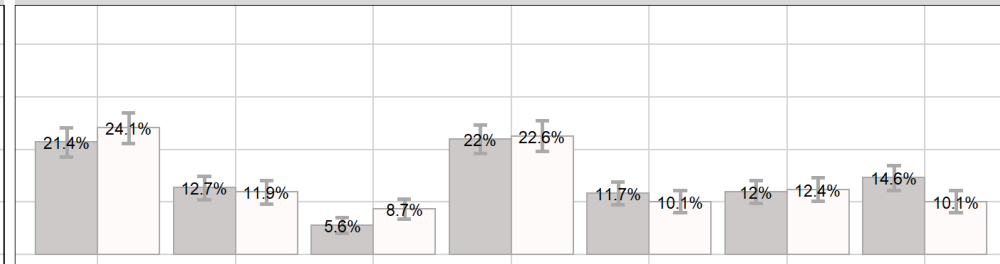
...increase the number of buck hunting licenses in later seasons in affected areas.



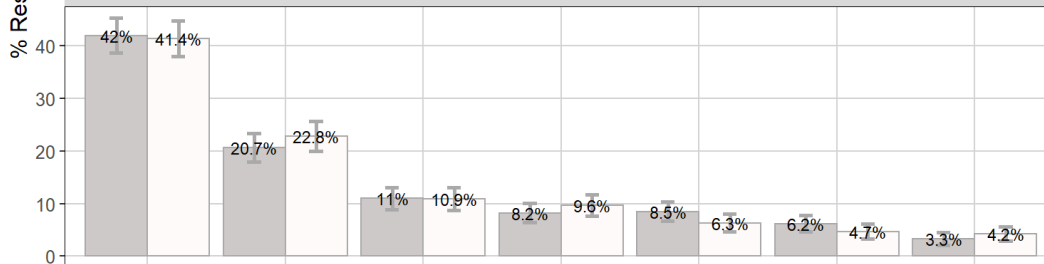
...increase the number of doe hunting licenses during existing hunting seasons..



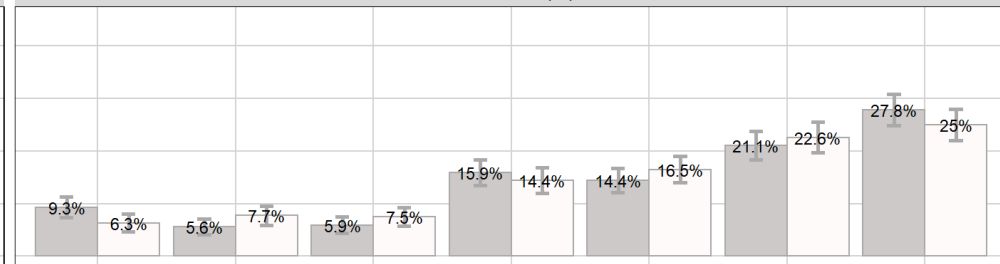
...reduce harvest of mountain lions in areas with high CWD prevalence.



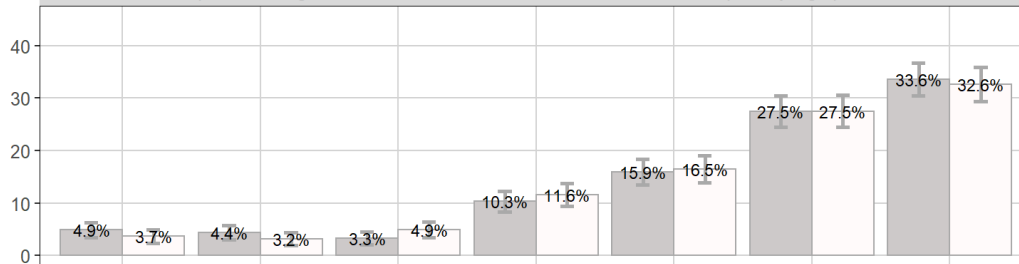
...take no action and allow CWD to take its natural course. .



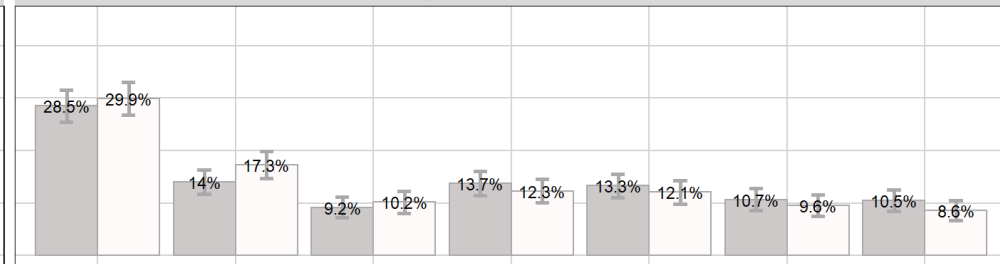
...use hunters to reduce the total deer population .bucks and does..



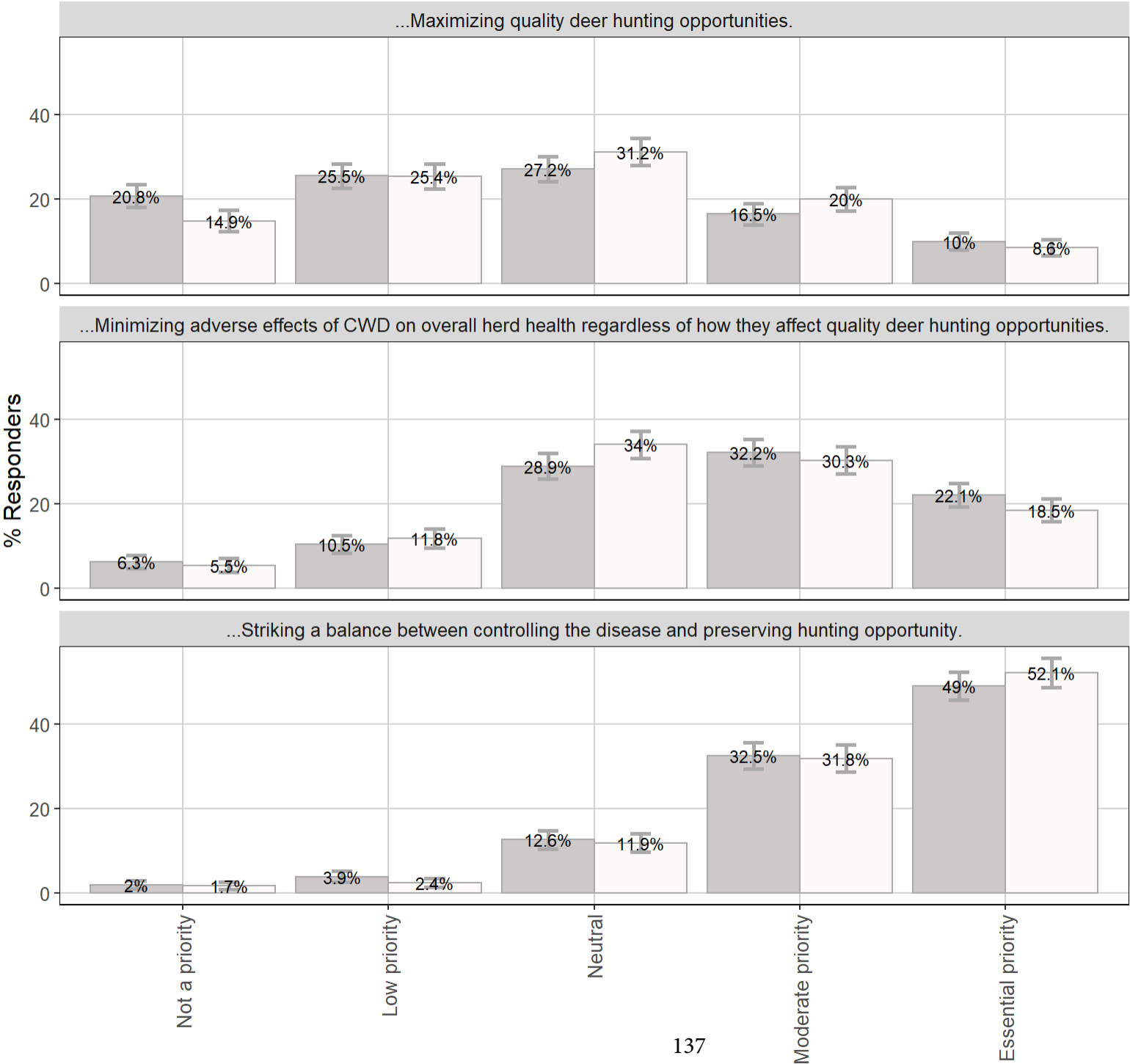
...use special management hunts to remove deer in localized areas of especially high prevalence .



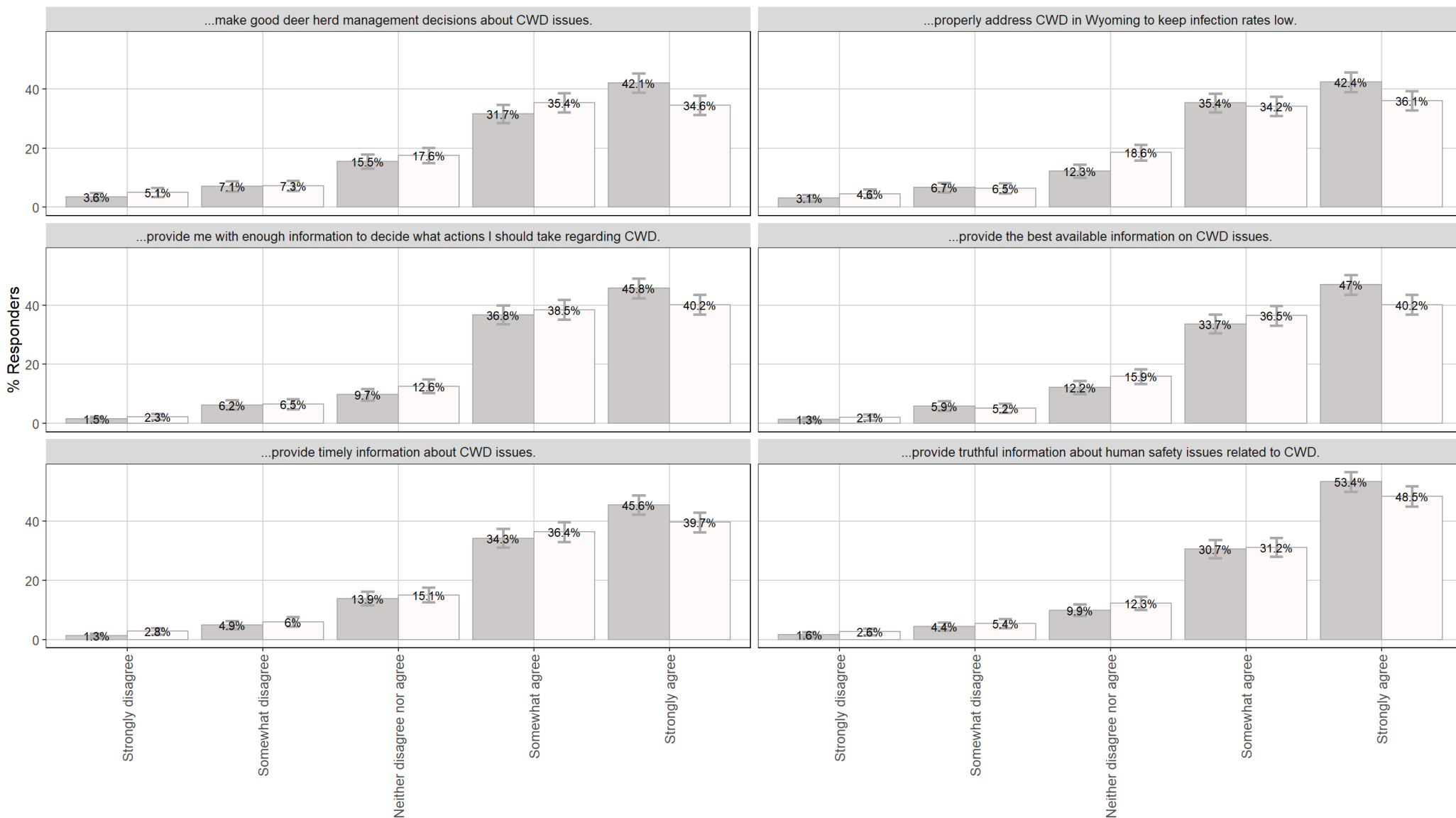
...use trained WGFD staff to lethally reduce herds in affected areas to lower infection rates.



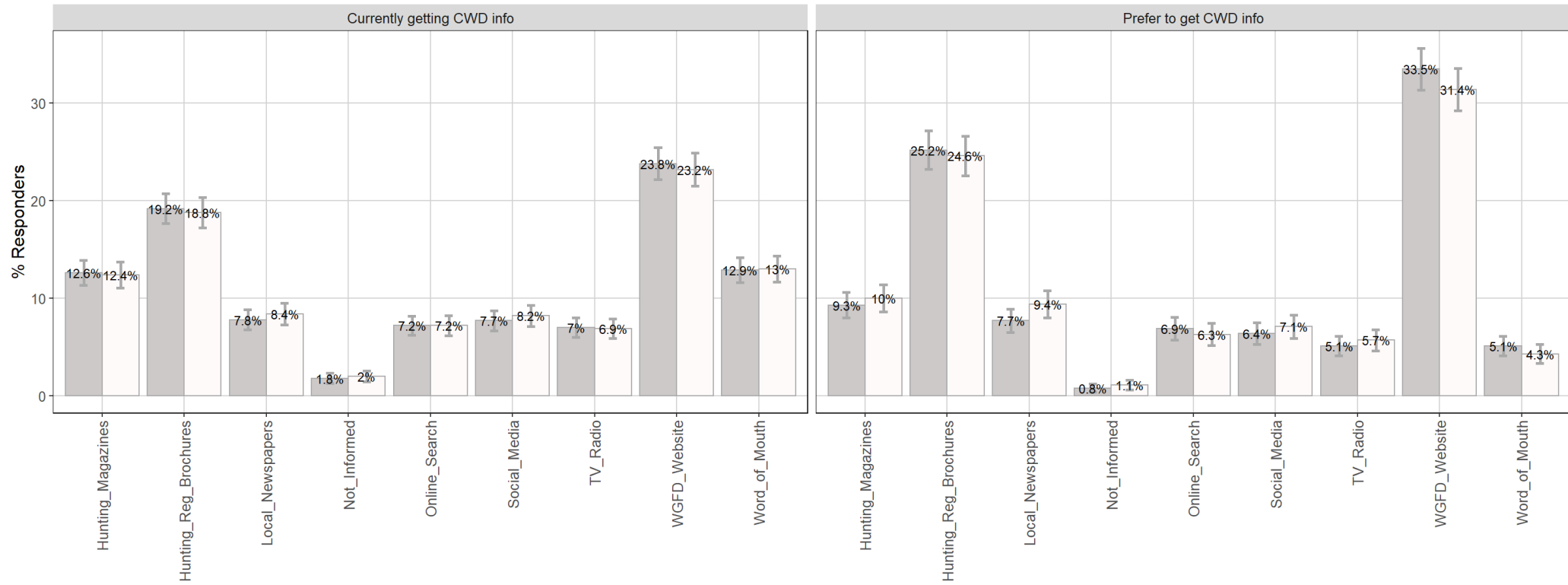
How much priority should WGFD place on...



I am confident that WGFD will...

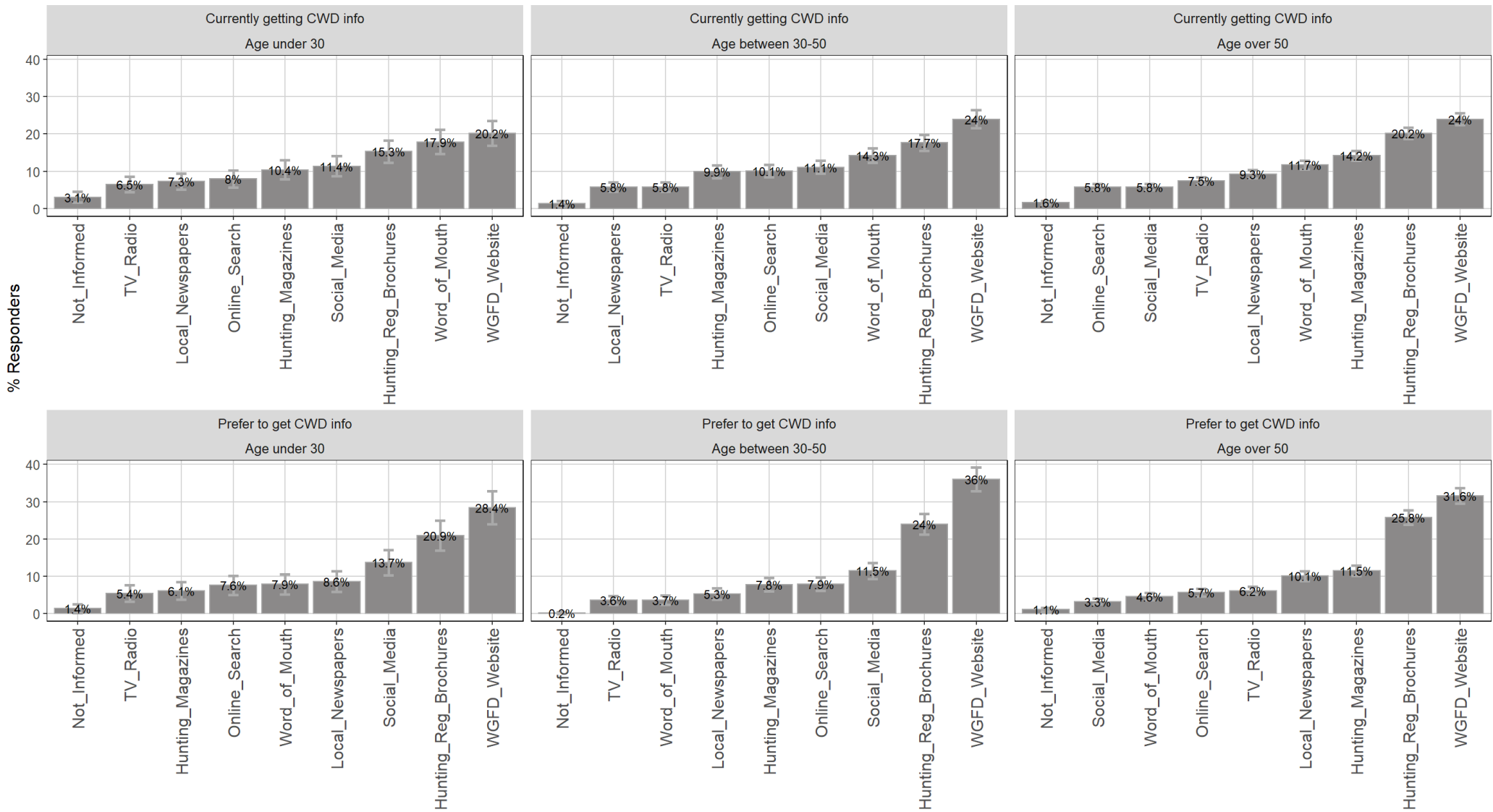


How do you currently/prefer to get information about CWD?



How do you currently/prefer to get information about CWD?(By age group) [Figure Legend](#)

All Responders



Your Perspectives About Chronic Wasting Disease in Wyoming

* Required

1. Survey ID: *

Background Information

2. Did you go deer hunting (mule deer or white-tailed deer) in Wyoming during the 2017 or 2018 deer hunting seasons? *

Mark only one oval.

- ☐ Yes Skip to question 3.
- ☐ No Skip to question 3.
- ☐ No, and I have never hunted for deer in Wyoming. Stop filling out this form.

3. Did you harvest any deer during the 2017 or 2018 deer hunting seasons in Wyoming?

Mark only one oval.

- ☐ Yes Skip to question 4.
- ☐ No Skip to question 5.

4. How did you dispose of your animal carcass(es) in 2017 and/or 2018?

Check all that apply.

- ☐ At a landfill or trash container that goes to a landfill
- ☐ Removed edible portions and left the rest where animal was harvested
- ☐ Carcass was disposed of by processor
- ☐ Other: _____

5. Overall, how satisfied were you with your deer hunting experience during the 2017 and/or 2018 hunting seasons?

Mark only one oval.

- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither unsatisfied nor satisfied
- ☐ Somewhat unsatisfied
- ☐ Very unsatisfied

6. How important to you is each of the following reasons to hunt deer in Wyoming?

Mark only one oval per row.

	Not important	Slightly important	Moderately important	Very important
To spend time in nature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To harvest a trophy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To spend time with family/friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To obtain wild game meat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To contribute to wildlife management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To contribute to the local community (e.g., financial benefits from hunters)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To test/improve my skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For physical exercise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. If you answered "Other", please specify your other reasons for hunting here:

Opinions About Chronic Wasting Disease (CWD)

Please read the following description before continuing:

Chronic wasting disease (CWD) is a disease of deer, elk, and moose. It is caused by an abnormal protein called a prion. In the early stages of the disease, infected animals appear healthy. In later stages, infected animals show changes in behavior and may appear thin or uncoordinated. Infected animals always die. The disease agent passes from animal to animal through saliva, feces, and other means and can persist in the environment for some time (Please note: the questions on this page and most of the remaining pages of this survey ask your opinions about CWD in deer specifically, in Wyoming). Infection with CWD shortens the lifespan of a deer and -- if infection becomes too common in a deer herd -- CWD can affect the herd's ability to sustain itself. Within infected deer herds, bucks tend to contract CWD at twice the rate of does.

To what extent do you disagree or agree with each of the following statements related to CWD?

8. I feel that I have enough information about...

Mark only one oval per row.

	Strongly disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Strongly agree
...where deer with CWD have been found in Wyoming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...which wildlife species can have CWD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...what causes CWD in wildlife	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...possible livestock health risks associated with CWD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...possible human health risks associated with CWD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...precautions that hunters should take because of CWD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...what Wyoming Game and Fish is doing about CWD in Wyoming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. To what extent do you disagree or agree with each of the following statements about CWD?

Mark only one oval per row.

	Strongly disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Strongly agree
Concerns about CWD have been exaggerated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Effort should be taken to reduce the rate of CWD in deer populations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CWD poses a risk to deer, but not to humans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CWD may pose a risk to humans, but not enough is currently known to be sure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Because of CWD, I have concerns about eating deer meat (for myself or my family)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Because of CWD in deer, how concerned are you about each of the following?

Mark only one oval per row.

	Not at all concerned	Slightly concerned	Moderately concerned	Very concerned
...your or your family's health?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...the health of affected deer herds in Wyoming?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...not having enough healthy deer to hunt in Wyoming?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...future generations ability to enjoy hunting deer in Wyoming because of CWD?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...the potential for CWD to reduce deer hunting opportunity in Wyoming?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...eating meat from a deer harvested in an area of high CWD prevalence (i.e., an area where 1 or more deer out of every 10 are infected)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hunting in Wyoming

Please read the following information before continuing:

Our records indicate that you may have hunted for deer in a hunt area where one out of every 20 or more harvested bucks are infected with chronic wasting disease (CWD).

11. Were you aware that you may have hunted for deer in a hunt area where CWD rates were less than or equal to 5%?

Mark only one oval.

- ☐ Yes
☐ No

12. How likely are you to go deer hunting in Wyoming in the next 3 years?

Mark only one oval.

- ☐ Very unlikely
☐ Somewhat unlikely
☐ Neither unlikely nor likely
☐ Somewhat likely
☐ Very likely

13. If at least 1 in every 20 deer (5%) were to become infected with CWD in the hunt area(s) where you currently hunt, how likely would you be to...

Mark only one oval per row.

	Very unlikely	Somewhat unlikely	Neither	Somewhat likely	Very likely
...continue hunting deer in this location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...support taking measures to control CWD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...find alternative places in Wyoming to hunt deer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...stop hunting deer in Wyoming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. If at least 1 in every 10 deer (10%) were to become infected with CWD in the hunt area(s) where you currently hunt, how likely would you be to...

Mark only one oval per row.

	Very unlikely	Somewhat unlikely	Neither	Somewhat likely	Very likely
...continue hunting deer in this location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...support taking measures to control CWD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...find alternative places in Wyoming to hunt deer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...stop hunting deer in Wyoming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. If at least 1 in every 5 deer (20%) were to become infected with CWD in the hunt area(s) where you currently hunt, how likely would you be to...

Mark only one oval per row.

	Very unlikely	Somewhat unlikely	Neither	Somewhat likely	Very likely
...continue hunting deer in this location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...support taking measures to control CWD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...find alternative places in Wyoming to hunt deer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...stop hunting deer in Wyoming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Have you ever personally harvested a CWD positive deer in Wyoming?

Mark only one oval.

- ☐ Yes
☐ No

17. Have you ever personally harvested a CWD positive elk in Wyoming?

Mark only one oval.

- ☐ Yes
☐ No

18. Are you aware of carcass transportation and disposal regulations because of CWD in Wyoming?

Mark only one oval.

- ☐ Not at all aware
☐ Somewhat aware
☐ Moderately aware
☐ Very aware

13. Given that at least 1 in every 10 deer (10%) are infected with CWD in the hunt area(s) where you currently hunt, how likely would you be to...

Mark only one oval per row.

	Very unlikely	Somewhat unlikely	Neither	Somewhat likely	Very likely
...continue hunting deer in this location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...support taking measures to control CWD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...find alternative places in Wyoming to hunt deer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...stop hunting deer in Wyoming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. If at least 1 in every 5 deer (20%) were to become infected with CWD in the hunt area(s) where you currently hunt, how likely would you be to...

Mark only one oval per row.

	Very unlikely	Somewhat unlikely	Neither	Somewhat likely	Very likely
...continue hunting deer in this location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...support taking measures to control CWD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...find alternative places in Wyoming to hunt deer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...stop hunting deer in Wyoming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. If at least 1 in every 2 deer (50%) were to become infected with CWD in the hunt area(s) where you currently hunt, how likely would you be to...

Mark only one oval per row.

	Very unlikely	Somewhat unlikely	Neither	Somewhat likely	Very likely
...continue hunting deer in this location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...support taking measures to control CWD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...find alternative places in Wyoming to hunt deer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...stop hunting deer in Wyoming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Have you ever personally harvested a CWD positive deer in Wyoming?

Mark only one oval.

- ☐ Yes
☐ No

17. Have you ever personally harvested a CWD positive elk in Wyoming?

Mark only one oval.

- ☐ Yes
☐ No

18. Are you aware of carcass transportation and disposal regulations because of CWD in Wyoming?

Mark only one oval.

- ☐ Not at all aware
☐ Somewhat aware
☐ Moderately aware
☐ Very aware

19. How unacceptable or acceptable would it be for Wyoming Game and Fish to take each of the following actions to stabilize or lower CWD infection rates (i.e., prevalence) in the hunt area(s) where you hunt deer?

Please note: It will likely take years to measure the results and effectiveness of a prescribed management action.

Mark only one oval per row.

	Highly un-acceptable	Moderately un-acceptable	Slightly un-acceptable	Neither	Slightly acceptable	Moderately acceptable	Highly acceptable
...take no action and allow CWD to take its natural course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...increase the number of buck hunting licenses during existing hunting seasons.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...increase the number of doe hunting licenses during existing hunting seasons.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...use hunters to reduce the total deer population (bucks and does)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...use trained WGFD staff to lethally reduce herds in affected areas to lower infection rates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...increase the number of buck hunting licenses in later seasons in affected areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...use special management hunts to remove deer in localized areas of especially high prevalence with minimum impact on overall deer numbers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...reduce harvest of mountain lions in areas with high CWD prevalence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. How much of a priority should Wyoming Game and Fish place on the following herd and harvest management decisions in the area(s) where you currently hunt deer?

Mark only one oval per row.

	Not a priority	Low priority	Neutral	Moderate priority	Essential priority
Striking a balance between controlling the disease and preserving hunting opportunity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maximizing quality deer hunting opportunities (i.e., trophy bucks), regardless of how they affect CWD prevalence or overall herd health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Minimizing adverse effects of CWD on overall herd health regardless of how they affect quality deer hunting opportunities (i.e. harvesting a higher percentage of bucks in the population)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. If you answered "Other", please specify other priorities the WGFD should have here:

To what extent do you disagree or agree with each of the following statements regarding your confidence in Wyoming Game and Fish (WGFD)?

22. I am confident WGFD will...

Mark only one oval per row.

	Strongly disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Strongly agree
...provide the best available information on CWD issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...provide me with enough information to decide what actions I should take regarding CWD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...provide truthful information about human safety issues related to CWD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...provide timely information about CWD issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...make good deer herd management decisions about CWD issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...properly address CWD in Wyoming to keep infection rates low	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. How do you currently receive information or stay informed about CWD in Wyoming?

Check all that apply.

- ☐ Social media (e.g., Facebook, Twitter, Instagram)
- ☐ Wyoming Game and Fish website
- ☐ Online searches (e.g., Google, Explorer, Safari, etc.)
- ☐ TV/Radio
- ☐ Hunting magazines (e.g., Field & Stream, Outdoor Life, Wyoming Outdoors)
- ☐ Local newspapers
- ☐ Word of mouth (from a friend/family member)
- ☐ Hunting regulations brochures
- ☐ Wyoming Game and Fish E-newsletter
- ☐ I do not stay informed about CWD
- ☐ Other: _____

24. Which three options do you most prefer to use when learning about CWD?

Check all that apply.

- ☐ Social media (e.g., Facebook, Twitter, Instagram)
- ☐ Wyoming Game and Fish website
- ☐ Online searches (e.g., Google, Explorer, Safari, etc.)
- ☐ TV/Radio
- ☐ Hunting magazines (e.g., Field & Stream, Outdoor Life, Wyoming Outdoors)
- ☐ Local newspapers
- ☐ Word of mouth (from a friend/family member)
- ☐ Hunting regulations brochures
- ☐ Wyoming Game and Fish E-newsletter
- ☐ I do not stay informed about CWD
- ☐ Other: _____

About You

25. How old are you?

26. With what gender do you identify?

Mark only one oval.

- ☐ Female
- ☐ Male
- ☐ Prefer not to say
- ☐ Other: _____

27. What is your current (residence) zip code?

28. Approximately how many years have you lived in Wyoming? (If you are not currently a resident, please leave blank)

29. How would you describe your racial or ethnic background?

Mark only one oval.

- ☐ White, non-Hispanic/Latino
- ☐ Hispanic/Latino
- ☐ Black or African American
- ☐ American Indian or Native Alaskan
- ☐ Native Hawaiian or other Pacific Islander
- ☐ Asian
- ☐ Prefer not to answer
- ☐ Other: _____

30. Please provide any additional comments you may have about chronic wasting disease in Wyoming:
