

**A SURVEILLANCE AND RESPONSE PLAN
FOR CHRONIC WASTING DISEASE
IN BRITISH COLUMBIA**

by

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BC Ministry of Forests

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SIGNATURE PAGE

A Surveillance and Response Plan for Chronic Wasting Disease in British Columbia

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Approved by:

A handwritten signature in blue ink that reads "Lynn Weber". The signature is written in a cursive style.

Director, Fish and Wildlife Branch

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Date

EXECUTIVE SUMMARY

BACKGROUND

Chronic wasting disease (CWD) is a fatal infectious, degenerative disease of the central nervous system affecting species of the deer family (cervids). CWD is classified as a transmissible spongiform encephalopathy (TSE), a group of diseases caused by abnormally shaped proteins or prions. Other TSEs include bovine spongiform encephalopathy (i.e. BSE or “mad cow disease”), scrapie in sheep and goats, and Creutzfeldt-Jakob disease in humans. These diseases rarely infect multiple species naturally, although research methods are used to transmit prion material among species groups. At this time, there is no direct evidence that CWD is transmissible to humans, however, some research results involving non-human primates suggest it may be possible, therefore Public Health authorities recommend precautions that include not using suspected or confirmed CWD positive meat for human consumption. CWD infection is inapparent in early stages of infection but in late stages clinical signs include weight loss, behavioral changes, drooling and poor coordination. CWD is fatal in all cases.

The origin of CWD is unknown. The disease was first detected in captive mule deer (*Odocoileus hemionus*) in a Colorado research facility in 1967, and in the free-ranging mule deer population in the 1980s. It has since been confirmed in captive and free-ranging elk (*Cervus canadensis*), white-tailed deer (*Odocoileus virginianus*), mule deer, and moose (*Alces alces*) in 27 US States and 3 Canadian provinces (Alberta, Saskatchewan, Manitoba), captive elk in South Korea, captive red deer (*Cervus elaphus*) in Quebec, free-ranging moose, reindeer (*Rangifer tarandus*) and red deer in Norway and free-ranging moose in Sweden and Finland. CWD has not been detected in British Columbia (B.C.) as of September 1st, 2022.

The diagnosis of CWD in one or multiple cervid populations in B.C. has the potential for far-reaching conservation, social and economic impacts. The disease threatens food security for First Nations and licensed hunters, cultural traditions, agricultural practices and local economies. The revenue generated from wildlife-associated businesses and recreation is important to First Nations and local communities, stakeholders, and wildlife conservation. Sales of hunting licences, sporting goods, and wildlife related tourism have declined following the diagnosis of CWD in some jurisdictions, and the financial, sociopolitical and resource costs of surveillance, response and management are substantial and, in many cases, have proved to be unsustainable.

SURVEILLANCE AND RESPONSE PLAN

Delivery of the *Surveillance and Response Plan for Chronic Wasting Disease in British Columbia* (The Plan) continues to be a high priority for the B.C. Wildlife Health Program (WHP) of the Ministry of Forests (MOF). The WHP delivers action on CWD through the B.C. CWD Program which has been funded by the Together for Wildlife Strategy since 2020. The Plan describes standard and recommended methods of prevention, surveillance, and early response actions in the event of a positive CWD diagnosis, providing a framework for the WHP to involve government staff, First Nations, stakeholders, agency partners, the B.C. CWD Advisory Committee, the regional CWD Working Groups,

wildlife health experts and others. The purpose of the Plan is to: define the risk of CWD for B.C.; guide implementation of plans and actions; assign roles in CWD prevention, surveillance, response and communications; and identify and respond to local and provincial concerns. The Plan is dynamic and responsive as new information becomes available.

Since 2001, the WHP, and now the CWD Program has assessed risk and methods of CWD entry into B.C. and conducted surveillance and outreach activities according to that risk. CWD risk in B.C. is based on proximity of the disease in other jurisdictions, the potential for importing CWD prions with carcasses or products, and practices that increase the density of susceptible species leading to increased disease transmission. CWD is now detected in free-ranging deer, within 50 km of the B.C. borders. The closest cases are in southwestern Alberta and northwestern Montana. While deer movement patterns in these areas are only partially understood, regional research suggests that seasonal movement patterns could bring infected animals in contact with uninfected deer or shed prions into B.C. habitats. It is now believed that the movement of infected live cervids into the province is one of B.C.'s most significant risk factors for the introduction of CWD. Regional wildlife biologists and CWD Programs in neighboring jurisdictions provide disease surveillance and population data to inform targeted surveillance in these high-risk areas.

The accidental importation of CWD infected or contaminated material into B.C. through the transport of intact carcasses or meat, plants (forages/grain/seed) or products derived from cervid biological material such as urine or blood-based scents is another significant risk factor. Research has confirmed that these materials can contain prions that in turn may contaminate soil and plants. CWD prions in the environment can persist, are resistant to any practical method of destruction, and have the potential to infect healthy cervids that are in contact.

Surveillance has proven to be essential to confirm CWD status, ensure early detection and develop an effective response. In B.C., submission of cervid heads for CWD testing is encouraged province-wide, however, the priority is for the areas of high risk adjacent to CWD-positive jurisdictions. Head submission in B.C. is voluntary except for mandatory submission for harvested deer in specific Management Units, to ensure the sample size reaches an appropriate confidence level. Deer heads from licensed hunting, vehicle collisions, and opportunistic collections are sampled, and tissues are collected for testing. Results are received primarily in the late fall and winter, CWD infection status reported to hunters who have submitted heads (via the website) and summarized in an annual report.

Communication is a strong focus for the B.C. CWD Program to increase awareness, reduce risk and promote participation in surveillance. Communications has focused on hunters and outdoor recreationalists through a variety of non-government organizations with a particular focus on First Nations communities through valued partnerships. A CWD Advisory Committee was created in 2006 and two Regional CWD Working Groups were established in 2007 to assist with a collaborative approach. Printed and online outreach materials, additional online resources, research extension and regular communication are updated and distributed regularly through these relationships. The CWD Program collaborates with other wildlife management and health agencies, academia, public health and

CWD experts to utilize their collective knowledge in evaluating new information and addressing knowledge gaps.

The Plan outlines the steps to be followed in the event of a CWD detection in a free ranging cervid population in B.C. or a significantly increased risk of CWD entry into BC, such as a CWD-positive animal in a high-risk location. The B.C. Wildlife Veterinarian will take the lead role in coordinating the response and will initiate an Incident Command System. The first step will be to confirm the diagnosis of CWD through additional laboratory testing. If the CWD positive diagnosis is confirmed, the B.C. Wildlife Veterinarian (under Wildlife Director authority) will lead in communication through the CWD Advisory Committee and Regional Working Groups before initiating early and ongoing response and management actions to assess the situation and, if necessary, take steps to prevent disease establishment and spread. The CWD Advisory Committee and Regional Working Groups are integral to decision making and will assist in communications. Response efforts will be adapted as the situation is better understood through the collection of information. The primary goal of response is the eradication of CWD in B.C. If eradication is not possible due to widespread disease, efforts will focus on preventing the spread of CWD into new areas and maintaining low disease prevalence within cervid populations. The Plan describes early response activities following a positive CWD diagnosis; longer term management of the disease in B.C.'s free-ranging cervid populations will be addressed in a follow-up CWD Management Plan to be developed with the collaborative team once the CWD situation in B.C. is understood.

CWD is one of the most challenging wildlife management issues in North America. The disease has reduced cervid populations, has negative socio-economic impacts and presents a potential risk to public health. Although many details about the disease remain unknown, much has been learned through research and experience over the last 3 decades. The Association of Fish and Wildlife Agencies (AFWA) in the *AFWA Technical Report on Best Management Practices for Prevention, Surveillance and Management of Chronic Wasting Disease* (2018) recommend comprehensive regional and national strategies for CWD surveillance and management. There is an emphasis for CWD-free jurisdictions to focus on prevention. B.C. has followed these recommendations and is promoting further research to better understand cervid population health status, dynamics and movement patterns and is strongly involved in cross jurisdictional networks that review and evaluate the effectiveness of management actions elsewhere. While there are very limited options available to respond to and effectively mitigate the impacts of CWD, the disease may behave very differently in B.C. compared to incidents of CWD in other affected jurisdictions. As more is learned about the varying dynamics of this disease, especially in ecosystems with similar geographical and biological features as B.C, the knowledge and tools will grow. This information will be critical to inform decision making and management actions should CWD be confirmed in the province.

For now, B.C. remains CWD free, however this status is likely to change in the near future. If the disease is allowed to go undetected and unchecked, the outcomes for wildlife will be much worse than if B.C. is successful in detecting early and responding quickly. This will take effort, dedicated resources, knowledge, and preparation. B.C. has an opportunity to be proactive, but the window is closing.

1.0 INTRODUCTION

1.1 Chronic Wasting Disease

Chronic wasting disease (CWD) is a fatal infectious disease of cervids (species of the deer family). The disease is of significant importance to wildlife managers, public health officials, agriculture, national and international trade, and communities that depend on healthy and sustainable wildlife resources.

CWD is classified as a transmissible spongiform encephalopathy (TSE), a group of neurological diseases that include bovine spongiform encephalopathy (BSE) or “mad cow disease”, scrapie in domestic sheep and goats, and Creutzfeld-Jacob disease in humans. All TSEs are caused by abnormally shaped cellular proteins or prions. Due to the abnormal shape, prions cannot be broken down and accumulate in tissues, concentrating in the central nervous and lymphatic systems. TSEs are usually species-specific, or rarely transmitted naturally from one species to another; however, cross-species transmission of CWD is documented in research settings where infectious doses are high or transmission is by an unnatural method such as injection into the brain (Race et al 2014, Kurt and Sigurdson 2015, Moore et al 2017, Czub et al 2017).

After initial infection, signs of CWD may not be noticed for months to years, but animals can shed prions throughout the course of the disease. Early signs of CWD include a gradual (chronic) weight loss and changes in movement and behavior. In later stages, drooling and difficulty swallowing, increased drinking and urination, depression, muscle trembling, poor coordination and stumbling may be observed. It is likely that most animals do not reach these advanced symptoms due to increased vulnerability to predation or accidents from severe impairment. The disease is fatal in all cases and there are no vaccines or treatments for CWD. The long incubation period and lack of practical diagnostic methods in live animals complicates early detection.

CWD can be transmitted by direct contact between infected and uninfected animals or through contact with infected soil or other shared resources (water or forage sources contaminated with CWD prions). Infected animals shed prions in their saliva, urine and feces and decomposing infected animals and their tissues degrade and deposit prions in the environment. Predators and scavengers may also contribute to the spread of CWD prions. Prions bind to soil particles, particularly if soils have high clay components. They may also bind to the surface of plants, contributing to their persistence in the environment. Plants can also uptake prions from the soil and animals that consume infected plant material can become infected. Infectious prions can persist in the environment for years, even in the absence of infected animals. CWD prions in the environment are persistent and require a treatment of extremely high heat of 1000°C degrees Celsius or more (Brown et al. 2004) to reduce infectivity. There is no practical method to test soils and plants or to test whether prions are destroyed after attempted destruction of contaminated materials, therefore, the long-term potential for disease exposure from a contaminated environment presents a complex challenge for monitoring and controlling new introductions or spread of the disease.

The gold standard for diagnosis of CWD is by the microscopic examination of tissues; the brain stem (obex) and lymphoid tissues of the head (tonsils and lymph nodes) are collected from deceased

animals and processed to visualize the abnormal prion accumulations. Only animals over 1 year of age provide a reliable result using this method because of the time it takes for prions to accumulate in the tissue. Live animal testing by microscopic examination of rectal or tonsil lymphoid tissue biopsies, is costly, labour intensive, less reliable and has limited management applications. Advancements in diagnostic tools has produced highly sensitive assays that can detect small amounts of prions and use alternate and more accessible host tissues, such as the outer ear and skeletal muscle (Ferreira et al. 2021, Li et al 2021). Amplification techniques, such as Real-Time Quaker-Induced Conversion (RT-Quic), are being developed for live animal and environmental testing but are currently restricted to research and commercial applications (Haley et al 2017).

1.2 History and Distribution of CWD

The origin of CWD is unknown. The disease was first detected in captive mule deer (*Odocoileus hemionus*) in a Colorado research facility in 1967 as a wasting syndrome, and later determined to be a TSE in 1978. Between 1981 and 1990, CWD was diagnosed in free-ranging populations of elk (*Cervus canadensis*), mule deer, and white-tailed deer (*Odocoileus virginianus*) in areas of Colorado and Wyoming. The first diagnosis of CWD in Canada was a retrospective diagnosis in 1981 of a mule deer, imported from the US, that had died at the Toronto Zoo in 1978, followed by detection in game farmed elk in Saskatchewan in 1996, also imported from the US.

As of February 2023, 29 US states, 4 Canadian provinces (Alberta, Saskatchewan, Manitoba, Quebec), South Korea, Norway, Sweden, and Finland have reported CWD cases. As of May 2023, CWD has not been detected in British Columbia (B.C.). CWD has been diagnosed in mule deer, white-tailed deer, elk, moose (*Alces alces*), reindeer (*Rangifer tarandus*), and red deer (*Cervus elaphus*). CWD has not been detected in fallow deer or North American caribou (*Rangifer tarandus*) in natural settings. The US Geological Survey's National Wildlife Health Centre maintains an up-to-date map of CWD distribution in North America (Appendix 1 and www.usgs.gov/media/images/distribution-chronic-wasting-disease-north-america-0). The first cases of CWD in Europe were recognized in free-ranging reindeer and moose in Norway in 2016, followed by intensive management to attempt to eradicate the disease through density reduction of potential hosts. Research has now shown that the CWD strains documented in Europe are distinct from the CWD strains in North America which suggests that North America may not have been the source of spread (Nonno et al 2020). The addition of reindeer to the species naturally susceptible to CWD has significant implications to the conservation and herd health of North American caribou, as reindeer and caribou are the same species.

CWD is considered enzootic in free-ranging cervid populations in parts of Alberta and Saskatchewan. In 1996, CWD was detected in game-farmed elk in Saskatchewan. Infected elk were likely imported into Saskatchewan in the 1980s from South Dakota game farm sources. In response, the province of Saskatchewan initiated a surveillance program in free-ranging deer through the submission of samples from hunter kills and clinical suspects. The first report of CWD in a free-ranging mule deer in Saskatchewan occurred in 2000. The management response reduced the density of free-ranging deer herds in specific areas, reduced congregation of deer in high-risk areas, and tested to confirm the number and distribution of infected deer. Between 1997 and 2020, Saskatchewan tested 51,749 free-ranging cervids, of which 1452 were confirmed CWD positive. Most Saskatchewan cases in free ranging cervids were in

mule deer, followed by white-tailed deer, elk, and moose. Adult male mule deer samples from the 2019-20 hunting season had a disease prevalence (percentage of positive results from all animals tested) of 40%.

In 2002, CWD was diagnosed in animals on two elk farms and one white-tailed deer farm in Alberta. All animals on the three farms were destroyed and tested but no additional cases were identified. Sampling of free-ranging deer in areas surrounding the infected game-farms was conducted by provincial wildlife authorities in the same year but no positive wild cervids were identified. However, CWD was diagnosed in a free-ranging hunter-harvested deer near the eastern Alberta border with Saskatchewan in September of 2005. The Alberta government responded rapidly with an intensive cull and salvage operation to reduce deer densities and increase surveillance. The mitigation efforts lost political and public support around 2008 and these management actions ceased. From 2005 to 2020, Alberta has tested over 80,000 free-ranging cervids, of which 2982, primarily mule deer, were CWD positive. Adult male mule deer samples from the 2019-20 hunting season had a disease prevalence of 24.5%. In 2013, Alberta detected the first case of CWD in moose in Canada from a CWD enzootic area with a high-density mule deer population. The first recorded case of CWD in a free-ranging elk in Alberta occurred in 2016.

In November 2021, Manitoba reported the first case of CWD in the province. A mule deer buck was observed exhibiting symptoms consistent with CWD. The animal was euthanized and confirmed CWD positive. This detection initiated response actions and enhanced surveillance to reduce transmission and provide test samples to better understand disease prevalence and distribution. Local community (landowner) hunting opportunities in addition to localized aerial depopulation have been implemented to achieve CWD management objectives. Subsequent testing has confirmed 2 additional CWD cases in mule deer from the response area (as of May 2022).

Many factors, both natural and anthropogenic, have contributed to the spread and increase in prevalence of CWD in North America (Miller and Fischer 2016). A significant factor has been the movement of live infected animals, both free-ranging and within the cervid game-farm industry, with animal movements (near and far distances) creating new infections. A federal disease control program was initiated in 2000 and CWD became reportable under the *Health of Animals Act* in 2001. Since 2000, the federal Canadian Food Inspection Agency (CFIA) has destroyed thousands of farmed cervids to control the disease on infected farms, however, game farms continue to be impacted by this disease. In the 1980s B.C. enacted legislation that resulted in lower risk to native cervids from CWD. The farming of native cervid species was never permitted, so this risk factor has been avoided. Under the B.C. *Game Farm Act* only fallow deer (*Dama dama*) and reindeer can be farmed and today very few of these farms remain active. Finally, there has been a prohibition on the importation of live native cervids into B.C. since 1991.

The multiple direct and indirect routes of infection complicate management of CWD. An infected animal will shed prions through saliva, urine, feces, and, after death as the infected carcass degrades on the landscape. Prions persist in the environment for years, possibly decades, and can infect new animals. The disease can be transmitted by direct contact between animals as well as contact with contaminated environments (soil) and shared resources (food, water). Prions are extremely resistant to

heat or any practical decontamination method and are essentially impossible to remove once introduced into the environment. Contaminated environments can be a source of infection to new animals in the absence of infected animals.

In assessing the risk of CWD introduction to B.C., several factors must be considered: the proximity of positive cases in free-ranging cervids, natural animal movements and the importation of infected carcasses and/or meat and contaminated materials such as hay. In recent years, CWD cases in free-ranging cervids have been detected within 50 km to the B.C. border in Alberta and Montana, within known deer movement corridors and migration patterns. While animals affected by CWD may not behave in the same manner as noninfected animals, the potential for movement of infected live cervids into B.C. from CWD positive areas is a significant risk factor. Infected animals that are not showing symptoms can spread the disease. Surveillance efforts in neighboring jurisdictions as well as research collaborations are vital for predicting species to focus surveillance on and potential entry points but more information on cervid population dynamics and patterns of movement is needed to better inform risk assessments and responses.

B.C. has implemented [regulations](#) to reduce the risk of CWD introduction by the importation of infected cervid carcasses or contaminated biological material. In 2010, B.C. enacted a regulation prohibiting the import of high-risk tissues (head, hide, hooves, spinal column, organs or mammary glands) from cervids harvested outside the province. In 2018, a regulation was introduced to prohibit the use of any cervid part or derivative (i.e., scents), originating from outside of B.C., for the purpose of hunting or trapping. The spread of CWD through natural animal movement is difficult to control but is relatively slow and predictable. The movement (import) of tissues or materials that contain CWD prions could introduce the disease to B.C. anywhere or anytime through human transport and improper handling or disposal.

CWD continues to spread and increase in prevalence in cervid populations in North America and beyond. The ability to manage wildlife diseases in general, never mind a disease with the unique characteristics of CWD, make the prospects for control and eradication unlikely in any region where it is established in a free-ranging population. The only true hope for control is to detect the disease and act quickly. New York responded rapidly and aggressively to their first free-ranging case in 2005. To date New York has had no further cases and is the only jurisdiction that has seemingly been able to eradicate CWD from a free-ranging population. The success seen in New York with their rapid action and the ongoing challenges in other areas where CWD has established, emphasize the need for B.C. to proactively plan and manage for CWD.

1.3 CWD and Human Health

Although prion diseases are rarely transmitted between species, research demonstrates that CWD can be transmitted to non-human primates and other mammal species, under certain conditions. However, the findings have been inconsistent. Czub et al (2017) documented CWD transmission to macaque monkeys by oral administration of CWD positive deer muscle and brain tissue. In contrast, the findings of Race et al (2018) did not demonstrate disease transmission to macaque monkeys by similar methods. There is no evidence at this time that CWD can infect humans, and there have been no reported cases of

human CWD. There is, however, still much unknown about CWD, so as a precautionary measure the World Health Organization, Health Canada, and other health authorities strongly recommend that all products from animals suspected or known to be infected with a prion disease not be used for human consumption. Hunters that harvest cervids from areas where CWD is reported are encouraged to take precautions when handling carcasses. Those precautions include avoiding handling brain, spinal cord, eyes, tonsils, spleen or lymph nodes and to leave these high-risk tissues at the kill site. When hunting in a known CWD area, hunters are advised to have the animal tested (mandatory in many CWD affected areas) and to wait for a negative result before consuming any part of the animal. First Nations have opportunity to harvest animals in adjacent jurisdictions or territories, and may use parts of the animal, such as brain, for cultural and traditional practices. This may present added risk and therefore collaboration with First Nations peoples is critical to ensure traditional uses, community health and access to healthy wild foods are maintained.

1.4 Free-ranging Cervids in B.C.

Free-ranging cervids populations are a highly valued natural resource in B.C. The management of free-ranging cervids is under the mandate of the B.C. Ministry of Forests. Free-ranging cervids are present in all 9 wildlife management regions and include Rocky Mountain elk, Roosevelt elk, moose, mule deer, black-tailed deer, white-tailed deer, and woodland caribou. BC's mountain sheep and mountain goats are not cervids and are not thought to be susceptible to CWD. A free-ranging (invasive) population of fallow deer is also present on the Gulf Islands of the B.C. coast. Cervid populations vary in distribution and abundance throughout B.C and unfortunately some species and populations are in decline. Many herds of caribou, for example, are now considered endangered, threatened, or extirpated. The data on cervid populations in B.C. is maintained by species specialists and regional wildlife biologists of MOF and the Ministry of Land, Water and Resource Stewardship (LWRS). Further cervid population information will not be presented in the Plan.

The health of B.C.'s cervid populations is important to both consumptive and non-consumptive users of wildlife. Hunting opportunities provide food and important connections to the land and traditions. Hunters play a vital role in the management of cervid populations through regulated harvests. All First Nations in Canada have a constitutional right to harvest wildlife for food, social and ceremonial purposes and rely on healthy populations. Communities, outdoor industries, and businesses rely on healthy wild cervids for robust economies. Wildlife viewing continues to be a growing and important sector of the tourism industry. The introduction of CWD to B.C. would seriously jeopardize the province's ability to effectively manage these populations and would negatively impact individuals, communities and businesses that rely on the resource.

1.5 Captive Cervids in B.C.

Management of game farms in B.C. is under the jurisdiction of the B.C. Ministry of Agriculture and Food (MAF). Game-farming in B.C. was approved for fallow deer and bison in May 1987 and reindeer in February 1988 and remains restricted to these species. For the purposes of this Plan, only fallow deer and reindeer are discussed. Bison are not cervids and CWD transmission is not documented in the species. In addition, fallow deer have not been reported to be naturally infected with CWD and are not considered susceptible unless inoculated intracerebrally (Rhyan et al, 2011, Hamir et al, 2011). In 1997

the inventory for fallow deer was 15,000 animals on 64 farms and 200 reindeer on 19 farms. In December 2021, a single reindeer farm (with 3 animals) and 10 fallow deer farms (with a total of 428 animals) were in operation in B.C.

B.C. regulations governing licensing, housing, transport, slaughter, and import and export of game-farmed cervids are comprehensive and game farms are required to comply with provincial regulations for domestic farm animals such as those outlined in the *Animal Health Act*, the *Livestock Act*, the *Animal Disease Control Act*, the *Waste Management Act*, and the *Meat Inspection Act*. If game-farmed animals escape and are at large for more than 30 days or are posing an immediate threat to property, or to other animals, humans, or wildlife, they are classified as wildlife and under the jurisdiction of MOF under the *Wildlife Act*.

The requirements to acquire a license for farming fallow deer or reindeer include an application to MAF. The specifics are reviewed in accordance with government regulations and policies, and a license is granted following a successful site inspection. The license is renewed annually provided that annual inventory and game-farm transaction reports are submitted.

It is the responsibility of licensees to obtain the appropriate approvals from federal and provincial agencies before transporting cervids across a provincial border. Provincial import regulations are under MAF and MOF and may differ from those of the CFIA. For example, the CFIA does not distinguish between native and non-native cervids, and has permitted the movement game farmed elk from Alberta to B.C. However, MOF prohibits transport of all live native cervids into the province and will not issue a permit for such shipments. Communication amongst producers and agencies involved is critical.

At this time, all farmed/captive cervids moved within Canada require a CFIA Cervidae Movement Permit. A veterinary certificate issued by an accredited veterinarian must confirm a negative herd status for tuberculosis (TB) and brucellosis. In addition, the herd must not be under investigation for or quarantined for CWD. For cervids transported to inspected slaughter, a Cervidae Movement Permit is still required but the requirement for negative TB and brucellosis status is waived. To import cervids into Canada from another country, the licensee must obtain a federal import certificate that meets the certification requirement of the importing country (Canada).

Transport of game-farmed cervids between farms or to slaughter facilities within B.C. currently does not require a provincial permit. The buyers and sellers are required to have valid game-farm licenses, and the animals must be identified with an approved B.C. registration ear tag. The movement must also be recorded on a Transaction Report. The movement of cervids from zoos to game-farms is not permitted without approval from MAF.

There is currently no mandatory testing program for farmed cervids in B.C. This is partly due to the species farmed not reported to be infected with CWD in Canada, but also due to the small size of the industry. The CFIA developed the Canadian Chronic Wasting Disease Voluntary Herd Certification Program (VHCP) for interested producers across Canada, to provide owners with an elite herd status with respect to CWD. The level at which a herd is certified depends on the length of time that the herd has

been participating in the program. Any premises on which cervids are kept are eligible to apply for entry into the program, and all cervids on the premise must be enrolled in the program.

1.6 Potential Effects of CWD

A diagnosis of CWD in B.C. has the potential for far-reaching conservation, social and economic impacts. The disease threatens cervid hunting and cultural traditions, food security, agricultural practices, and local economies.

CWD is fatal in every case and therefore reduces the lifespan of infected animals. Several studies have suggested that CWD can cause population declines in deer and elk populations after reaching a disease prevalence of 20% or more (Monello et al., 2014; Edmunds et al., 2016; DeVivo et al., 2017). Depending on the ecosystem, these population level impacts can shift demographics (with fewer older animals) and lead to decreased hunting opportunities. Caribou in Canada are in decline and the threat of CWD exposure to already vulnerable populations may complicate recovery efforts. Activities, such as translocations or supplemental feeding, may increase risk of CWD exposure and transmission within caribou populations (Balyx and Ford 2022). If CWD enters a cervid population of conservation concern, this complicates potential mitigation measures such as increased harvest, targeted sampling or removals.

The revenue generated from wildlife-associated industries and recreation is important to First Nations, local communities and stakeholders. In Canada, an estimate from 2015 suggests that approximately 2.1 million people spend over \$1.8 billion on hunting-related expenses annually (Arnett and Southwick 2015). These funds partly support wildlife management agencies, which in turn fund wildlife conservation and management (Heffelfinger et al. 2013).

Sales of hunting licences, sporting goods, and wildlife related tourism have declined following the diagnosis of CWD in some jurisdictions, and the required resources for surveillance, response and management are substantial and, in many cases, have proved to be unsustainable. In BC, surcharges associated with the sale of hunting licences and species licences are dedicated to wildlife management. If licence sales are impacted by the onset of CWD in BC, then dedicated funding for wildlife management will decrease.

In the US, economic losses from declining hunting-related activities (e.g., license and sporting goods sales, lodging, tourism) have been documented following a CWD diagnosis (Bishop 2010). Human dimension research indicates that hunter participation and confidence in managing agencies drops when infectious diseases such as CWD are diagnosed in a free ranging cervid population (Vaske 2018, Holland 2020, Quartuch 2020). In addition to these short-term effects, longer term effects of CWD include fewer cervids on the landscape (DeVivo 2015, Edmunds et al 2016), reduced hunting opportunity and access to game meat. In all cases, the funds required for CWD management activities are significant and will put strain on limited resources allocated to other wildlife conservation efforts.

CWD is of international concern, in part because it is a prion disease related to BSE, but also because it is thought to have been introduced to new areas, including other continents (e.g., Korea) via the transport of infected animals, contaminated animal parts and possibly even contaminated plants (hay and grains). Accurately determining the economic impacts of CWD on the Canadian game-farming industry is

difficult, but international trade restrictions of livestock, hay, and velvet have negatively affected Canadian game-farming. Potential restrictions on the movement and transport of plants (as applied by Norway) present implications to agriculture and range management practices and economies. The sourcing of forages for livestock or grain seeds for feed or crops may be impacted as their sourcing varies with production and these materials, if contaminated with prions, have the potential to introduce the disease to new captive and free-ranging cervid populations.

1.7 Human Dimensions of CWD

Wildlife is an important link between humans and nature. For many Indigenous peoples hunting is deeply intertwined with culture, traditions, and identity. Non-indigenous communities also rely on wild game as an integral part of their diet. The impacts of hunting extend beyond individuals and communities, contributing to local and national economies through the sale of hunting licenses and hunting-related goods. As such, healthy wild game populations are integral to human food systems, relationships with nature, and economies. CWD poses a real risk to wildlife health in Canada with the potential to negatively impact human relationships with wild game. Health Canada advises that people not consume CWD-positive animals (Health Canada 2019), which has significant implications for hunters and Indigenous peoples who rely on wild game for food security (Parlee et al. 2021). Further, human perceptions of diseased wildlife can degrade trust in healthy wild foods, leading to less hunting and nature-based activities in areas where the disease is present (Bishop 2010). Hunters play a vital role in the management of wildlife diseases such as CWD, however perceived risk may lead to changes in behaviour and associated trust in the managing agency (Holland et al. 2020).

2.0 OVERVIEW OF THE PLAN

The B.C. CWD Surveillance and Response Plan (the Plan) builds on recommendations and guidelines from other CWD management plans, peer-reviewed literature, risk assessments and technical reports, including the Association of Fish and Wildlife Agencies (AFWA) Technical Report on Best Management Practices for CWD (Gillin and Mawdsley 2018). The Plan will be dynamic and will be updated every 3 years to include new science and management resources and current disease distribution. This plan was last updated in June 2023.

The Plan is delivered by the B.C. Wildlife Health Program of the Ministry of Forests in collaborations with First Nations, agency, academic and stakeholder partners and CWD experts, collectively the B.C. CWD Advisory Committee and CWD Working Groups, who continue their involvement and provide input and endorsement of the Plan.

The Plan describes standard and recommended methods of prevention, surveillance, and early response actions in the event of a positive CWD diagnosis, providing a framework for the B.C. CWD Advisory Committee and Regional CWD Working Groups to follow in implementation and planning. The purpose of the Plan is to: define the risk of CWD for B.C.; guide implementation of plans and actions; assign roles in CWD prevention, surveillance, and response; communicate with the First Nations, stakeholders, and the public; and identify and respond to local and provincial concerns.

2.1 Objectives of the Plan

- Provide a framework that guides the B.C. CWD Advisory Committee and CWD Working Groups in collaborative CWD efforts in B.C.
- Provide a coordinated, standardized, science-based approach to prevention, surveillance, and response activities.
- Present the current state of knowledge on CWD distribution, research and risk evaluation for B.C.
- Summarize current activities and recommendations for prevention, surveillance, response, and associated communications.
- Present the general steps and roles for the initial response to a positive CWD diagnosis in B.C.
- Provide financial and capacity needs for delivery of the Plan.

2.1.1 Risk Evaluation

An evaluation of risk of CWD to B.C. considers the current distribution of CWD and factors influencing the risk of exposure and disease transmission. The risk evaluation is reviewed and updated as new information becomes available. The risk evaluation provides a qualitative analysis of the current risks in B.C. Some of the risk factors presented below are present in B.C. and a detailed explanation of the current situation is provided here:

1. Density of free ranging cervid populations

- The distribution and density of free-ranging cervids varies with species biology and habitat quality and quantity on a seasonal and annual scale. Severe conditions with deep and crusting snow can concentrate deer, elk and moose at higher-than-normal densities, especially in agricultural areas (crops and haystack yards). The Plan cannot summarize all cervid density data for B.C. and any response would require additional in-depth, local information on the cervid species in the area.

2. Presence of native cervid game-farms

- Native cervids are not game-farmed in B.C. and regulations control the movement of non-native game-farmed cervids (reindeer and fallow deer) into and out of B.C. Although B.C. game-farmers do not routinely test for CWD, the few farms present (reindeer (1), fallow deer (10)) are considered a low risk.
- Native cervid game-farms are present in Alberta and Montana and some are near the B.C. borders. Good communication with those jurisdictions on disease status is critical.

3. Proximity to CWD-positive free-ranging or game-farmed animals.

- Increasing CWD-positive cases in northwest Montana and southwest Alberta create an increased CWD risk in the Kootenay Region in southeast B.C. CWD-positive animals are now found within the range of natural animal movement between B.C., Alberta and Montana.
- CWD was confirmed near Libby, Montana in June 2019, within 60 km of the B.C. border. This was the first detection of CWD west of the Rocky Mountains. Subsequent surveillance efforts have revealed over 130 cases in the Libby area as well as new CWD-positive areas in western

Montana. Cases appear to be clustered around the Libby area with an overall prevalence of approximately 4%.

- In fall 2020, Montana reported that a game farm in Flathead County was confirmed positive for CWD. This was the second detection of CWD in captive cervids in Montana in 2020. Montana's CWD Herd Certification Program requires all animals greater than 12 months of age to be tested when it dies. Montana also requires CWD-positive game farm herds to depopulate with post-mortem testing of the herd, or quarantine of the herd for a period of five years from the last CWD-positive case.
 - In May 2021, Alberta reported westward spread of CWD in free-ranging cervids from prairie habitats into the foothills of southwest Alberta. Several cases of CWD in free-ranging white-tailed deer and mule deer are within natural cervid movement into B.C.
 - The risk of CWD-positive carcasses or tissues entering B.C. has increased due to the expanding disease distribution and prevalence in animals in Alberta and Montana as well as hunters from B.C. returning with carcasses and meat.
 - Alberta has detected CWD on approximately 15 cervid farms. As of April 2021, 4 cervid farms are CWD-positive and have not been depopulated. There is risk of disease transmission from escaped stock, fence-line contact or movement of contaminated materials, such as hay and feed.
 - CWD has not been reported in free-ranging or captive cervids in the Yukon, Northwest Territories, Washington.
 - Idaho reported the first CWD-positive cases in November 2021. Enhanced surveillance revealed a cluster of cases in central Idaho and a small-scale targeted cull was implemented in March 2023. CWD has now been detected in elk, white-tailed deer and mule deer in Idaho (<https://cwd-info.org/category/idaho>).
4. Proximity to environments with a history of CWD-positive animals
- There is no practical method to test soils, plant material or other environmental surfaces for the presence of CWD prions.
 - Prions in the environment remain infectious for years, even in the absence of additional infected animals. Environments with a history of CWD-positive animals or materials, whether in a captive or wild setting, could be a potential point source of CWD to new cervids.
 - Most jurisdictions monitor CWD-positive game farms and manage to contain the prions. However, there are no proven methods to decontaminate environments and few procedures or policies effective to control the movement of contaminated plant material.
 - Specific locations and other details pertaining to CWD-positive game farms in Alberta and Montana cannot usually be shared with other agencies or the public, especially in early stages of response to CWD detection.

5. Import of infected cervids or cervid parts from CWD affected areas.

- Canadian Food Inspection Agency regulates cervid movement into and within Canada. Import of live native cervids into Canada from any US state with CWD-positive free-ranging cervids is prohibited. Importation of live native cervid species into B.C. is prohibited under the *BC Wildlife Act*.
- Occasionally, a small number of live cervids are imported into B.C. zoos for permanent captive display under permit. In addition, there can be a time limited importation of live cervids for research or for the movie industry, again under permit.
- Translocations of cervids have historically occurred within B.C., more recently following B.C. Translocation Policy and Procedures (2015), based on International Union for Conservation of Nature Guidelines (<https://www.iucn.org/resources>) to reduce risk and ensure animal welfare. Woodland caribou were captured live and transported within B.C. and into the US several times historically, and in 2012 for herd recovery purposes. In 2016, urban mule deer from communities in the East Kootenay were live captured and translocated to natural habitats, in part to reduce density and monitor survival. That project has ended and no cervid translocations are now permitted in the Kootenay Region due to the high risk of CWD.
- Several permitted wildlife rehabilitation facilities in B.C. receive and rear orphaned cervids and, at 6 months or more of age, release them in locations within approximately 10 km of their capture location. They have previously been required to have Canadian Food Inspection Agency Cervidae Movement permits to do so, however, compliance is unknown. This risk still exists since there is little monitoring of orphaned cervids after release.
- Possession of high-risk cervid tissues (brain, spinal cord, organs, lymph nodes) harvested outside of the province is prohibited under the *BC Wildlife Act*. If harvested in a CWD-positive area, the tissues could introduce the disease to B.C. Many hunters are knowledgeable of CWD risk and comply with the regulation, but carcasses (intact and remains) are transported into B.C. and are disposed in the environment, highlighting the need for improvements in awareness of the risk to B.C. wildlife. Reports of this activity may or may not reach enforcement or regional staff. Insufficient education on CWD leaves B.C. vulnerable to CWD introduction by human importation. First Nations and other small communities may be particularly impacted through cultural uses of high-risk tissues and traditions of hunting in neighboring traditional territories and jurisdictions.
- Incineration is the most effective method of deactivating CWD prions, however, B.C. has only one facility in the Lower Mainland permitted to dispose of CWD-positive or suspected material. Deep burial at an authorized landfill is an acceptable alternative if incineration is not feasible. A lack of effective disposal options for high-risk or positive CWD material creates a serious risk for B.C.

6. Use of cervid attractants or repellents containing cervid biological materials (urine, blood, antler velvet).

- Attractants and repellents using cervid urine and blood (and antler velvet) are collected from game farmed cervids, processed, and sold at stores or online for a variety of purposes. There is

little quality control since it is unknown if the farm source is CWD-positive and very difficult to test these substances for CWD prions and infectivity. Any cervid product containing CWD prion creates a risk of environmental contamination and animal infection. The use of cervid-based attractants for the purpose of hunting or trapping is prohibited under the *BC Wildlife Act*. These products are also banned in Manitoba, Ontario, Yukon, and several US states.

7. Import of potentially contaminated plant material from CWD affected areas.

- Research has demonstrated that plants (forages, grain, seeds) can uptake and bind to CWD prions, and those prions were infectious for several weeks (Pritzkow et al 2015). Contaminated plant material has yet to be confirmed as a source of CWD introduction to a new area in a natural setting, but confirmation is challenging, and the risk exists. Forage and grain fed to livestock or used for emergency wildlife feed may be grown in B.C., but much is imported from elsewhere and is not identified, creating risk of CWD introduction. The diagnosis of CWD in Scandinavia led to Norway banning hay importation from CWD endemic areas in North America as a precaution to reduce the risk of further disease introduction. Legislative tools in B.C. to prescribe sources for forages and feed are limited unless CWD is diagnosed in B.C. Until then, the focus is to increase awareness of the risk through communication to the agriculture industry, livestock producers and partner agencies. The BC Wildlife Federation approved a resolution proposing policy direction urging agencies with legal authority to prohibit the import of plant materials from CWD affected areas.

8. Aggregation of cervids through baiting, supplemental feeding, or other human-related activity.

- Attractants and other human-related activities that contribute to an aggregation of animals and an increased frequency and duration of visits to particular sites have been shown to increase disease transmission in cervids (Miller et al 2007, Thompson et al 2008). The potential for CWD transmission is therefore higher at artificial feeding sites (Mejia-Salazar et al 2018) through increased contact rates between animals and increased shedding of CWD prions into the environment. While there are other reasons to avoid aggregations of cervids, the disease risk creates firm justification for strong policy and regulatory tools to avoid baiting, supplemental feeding or other human-related activities creating high density, frequency and duration of cervids at these sites. Due to the risk of CWD, in 2020, a regulation was enacted to prohibit ungulate feeding or baiting in the Kootenay Region (except under permit).

9. Number and density of predators.

- B.C. ecosystems and species richness vary tremendously, and in most regions, there is still a close to full suite of native predators, from bears and wolves to mesocarnivores. In general, predator abundance is difficult to estimate and varies with habitat quantity and quality, hunting, trapping and species-specific management practices. Urban and peri-urban areas lack many predator species but often have higher numbers of urban adapted predators such as coyotes. Urban deer populations can be at high density, presumably from less predation and food supplementation and tend to live longer than in a natural setting. These factors may have led to a

high CWD prevalence within urban cervid populations (Montana Chronic Wasting Disease Management Plan 2020). Carnivores may play a role in removing infected animals from the landscape that have a reduced as a result of the disease. Potentially contributing to reduced disease prevalence and spread (Wild et al 2011). That said, scavengers may also play a role in spreading CWD prions large distances after consuming CWD infected prey (Nichols et al. 2015).

10. Presence of contiguous habitat or migration corridors used by cervids.

- Research programs using GPS collars have confirmed cervid seasonal use of and movement across continuous habitats and/or corridors that may cross provincial and international borders. In general, cervids exhibit movement patterns with some portion of the population resident year-round and others that move over distances that vary from few to many kilometers. CWD-positive free-ranging cervids are present in southwest Alberta and northwest Montana, within range of annual movements. Even the Rocky Mountains do not act as a barrier to cervid movement with collar data confirming mule deer movements to and from southwest Alberta. The same movement is documented into Montana but there is less information on natural movement patterns between the B.C. and Montana and Idaho and the Peace Region and Alberta. Further research on caribou, mule deer and white-tailed deer movement patterns and habitat connectivity associated with CWD risk is strongly advised. The presence of natural and artificial barriers (i.e.: lakes, fences) should also be considered as a potential factor in altering cervid movement patterns.

2.3 B.C. CWD Advisory Committee and CWD Working Groups

A diagnosis of CWD in B.C. would have far-reaching impacts and implications to public health, food security, agricultural practices, local economies, societal values, and traditional hunting practices. Any planning and actions must be developed in collaboration, incorporating relevant authorities, local and technical knowledge, and societal values in a meaningful and respectful partnership.

The B.C. CWD Advisory Committee was formed in 2006 and is co-chaired by the B.C. Wildlife Veterinarian and CWD Program lead from the Wildlife Health Program. The role of the Committee is to advise and support the Program at a provincial level. Two regional CWD Working Groups were formed in 2007 in the Kootenay and Peace Regions and are co-chaired by the B.C. Wildlife Veterinarian and CWD Program lead. As the CWD situation evolves and risk increases in other areas, additional CWD Working Groups will be formed. The role of each CWD Working Group is to advise and support the Program at the local level. CWD Program updates are distributed quarterly with an annual meeting to deliver the annual program report and begin planning for the coming year.

The objectives of the B.C. CWD Advisory Committee and CWD Working Groups:

1. Provide input on the Plan.
2. Identify specific responsibilities and roles of each agency or group in prevention, surveillance, response and communication.
3. Aid in coordination and implementation of activities and dissemination of information.
4. Support the B.C. Wildlife Health Program in the delivery of the Plan.

3.0 PREVENTION OF CWD

Preventing the spread of CWD into B.C. is the primary objective of the CWD Program. Once CWD is established in a free-ranging population and prions are present in the environment, it is virtually impossible to eliminate the disease from the landscape.

3.1 Current CWD Prevention Activities

1. Prohibited import of live native cervids: In 1991, B.C. legislated a ban on all imports of live, native cervids into the province (*Wildlife Act* Permit Regulations: Section 7(1)). The regulation reduces the risk of novel disease and parasite introduction into free-ranging cervid populations.
2. Regulated movement of captive non-native cervids: The movement of non-native game-farmed cervids (reindeer, fallow deer) is regulated by the Ministry of Agriculture and Food and the Canadian Food Inspection Agency and is permitted within B.C. Transport of animals across provincial and international borders is restricted and permit and health certificates are minimum requirements. The movement of other species of cervids is permitted on a case-by-case basis under the *Wildlife Act*.
3. Prohibited import of intact cervid carcasses and high-risk parts: In 2010, B.C. prohibited possession of the head, hide, hooves, spinal column, internal organs, or mammary glands of cervids harvested out-of-province (*Wildlife Act* Permit Regulations: Section 15(3)). Highway signs promoting this message were erected in 2010 and remain at the BC-Alberta border on two main highways (Hwy 2 in the Peace and Hwy 3 in the East Kootenay). In October 2022 this regulation was amended to expand the list of prohibited parts, most notably bones. The current regulations states that it is unlawful to possess any part of a Cervidae (caribou, deer, elk, moose), that was killed outside of British Columbia, other than (1) the edible meat of the four quarters, loins, neck and ribs, or (2) the hide, antlers and skull plate if, before being brought into British Columbia, the part is cleaned in a manner that removes all tissue. Despite this regulation, intact cervid carcasses continue to be brought into B.C., transported to various areas and in some cases delivered to butchers for processing.
4. Prohibited use of cervid scents and attractants: In 2018, B.C. prohibited the use of any part or derivative of a cervid sourced from outside B.C., for the purpose of hunting or trapping (*Wildlife Act* Hunting Regulation, Section 18(1)(n)). CWD prions can be present in urine or other biological material of an infected animal and can be a potential source of environmental contamination.
5. Prohibited feeding or baiting of ungulates: There is clear evidence that the supplemental feeding of cervids is rarely necessary for the persistence and health of populations and has significant negative consequences, including the risk of increased CWD transmission (Mejia-Salazar et al 2018). In 2020, feeding or baiting ungulates in the Kootenay Region was prohibited, except under permit and for emergency purposes (*Wildlife Act* General Regulation, Division 23.02). This area is at high risk for

introduction of CWD and feeding programs can concentrate ungulates, increasing disease transmission rates.

6. Best Management Practices for Transport, Storage and Disposal of CWD confirmed and high-risk material (2020): B.C. developed these best management practices to reduce the risk of CWD introduction through appropriate CWD-positive carcass and meat handling and disposal. This document is intended for government staff (i.e., wildlife and enforcement staff) and contractors (i.e., CWD coordinators) that assist with the transport, storage, and disposal of this material (Appendix 3).
7. Communication materials to increase awareness of CWD risks: Awareness of CWD and risk associated with human activities is critical for disease prevention. Information is developed and distributed through the CWD website (www.gov.bc.ca/chronicwastingdisease), partner websites and social media platforms, presentations and workshops, printed material, media releases, interviews and the BC Hunting and Trapping Regulations Synopsis.

3.2 Recommendations for 2023-25

1. Implement Best Management Practices for Transport, Storage and Disposal of CWD materials: Best management practices were developed by the Wildlife Health Program to reduce risk of CWD introduction through human activity. Staff and contractors must be familiar with and follow the recommendations in this document (Appendix 3). Direction and training should be applied where needed with wildlife and enforcement staff, and contractors. Continue to collaborate with Ministry of Agriculture and Food, Ministry of Transportation and Infrastructure, Ministry of Environment and Climate Change, highway contractors and municipalities to develop safe and sustainable disposal options for CWD material and high-risk carcasses, including in-province capacity and infrastructure that can provide secure depots for large volumes of carcasses.
2. Increase communication of regulations to increase compliance: Education of risks associated with human activities and the regulations that have been implemented to reduce risk should be delivered through outreach using appropriate messaging and platforms. Assistance from partners will be required for appropriate language and delivery.
3. Increase communication and awareness of risk associated with feeding or baiting of cervids: Communication material should be developed and distributed to support the new regulation in the Kootenay Region, and the prohibition should be considered in other parts of B.C. As such, in conjunction with First Nations and stakeholders, regions should develop supplemental feeding policies and procedures that consider risk and consequences for determining when and how supplemental feeding might be considered and deployed.

4. Increase awareness and propose best practices to reduce risk of importing hay and grain: The BC Wildlife Federation approved a resolution proposing policy direction urging agencies with legal authority to prohibit the import of plant materials from CWD affected areas. Building on this, communication materials should be developed with agency partners and stakeholders (agriculture industry, livestock producers) to increase awareness and propose recommendations for best practices.
5. Inventory cervids in game-farms/zoos and review of disposal practices: Ministry of Agriculture and Food to provide up-to-date data on locations and contacts for captive cervids in B.C. to ensure information is readily available in the event of positive diagnosis.

4.0 SURVEILLANCE FOR CWD

Disease surveillance is defined as an information-based activity involving the collection, analysis, and interpretation of large volumes of data originating from a variety of sources. It is used to evaluate the effectiveness of control and preventative measures, monitor changes in infectious agents, support planning and allocation of resources, identify high risk populations or areas to target interventions, and to provide an archive of disease activity for reference.

Surveillance for CWD is critical to confirm CWD status and to detect as early as possible to ensure better outcomes for wildlife populations. Detecting CWD early while at a low prevalence provides the best opportunity for success in control and eradication of the disease. An effective CWD surveillance program requires the collection of an adequate number of samples (for statistical confidence), timely analysis of those samples, interpretation of the results, and reporting to submitters, the Advisory Committee and Regional Working Groups.

In 2001, B.C. initiated surveillance for CWD in all native cervid species with a focus on deer in areas considered at high risk of infection near the US and Alberta borders (Peace and Kootenay regions). As of March 2023, there have been no positive CWD cases in B.C. The statistical confidence in disease status has been low due to low sample size but considered generally acceptable in the earlier years of the program due to low risk. CWD-positive cases are now much more prevalent and closer to the B.C. border therefore the current risk is significantly greater in recent years. Mandatory submission was implemented for the first time in 2019 in several Wildlife Management Units in the Kootenay Region to increase the confidence that the disease was not present. Mandatory submissions resulted in a 10-fold increase in sample numbers from 2019 to 2020 for far higher confidence in absence of the disease (detection limit) in those specifically targeted units. Surveillance updates and results can be found at www.gov.bc.ca/chronicwastingdisease.ca

4.1 Current CWD Surveillance Activities

1. CWD surveillance in free ranging cervids by voluntary/opportunistic submissions: The B.C. Wildlife Health Program requests the submission of suitable heads from any cervid species (over one year of

age) for testing. Samples are accepted from all areas in B.C. Head submission is highly encouraged but voluntary in most regions of the province. Hunter samples, road kills, clinical suspects and other opportunistically collected samples are submitted for testing. Between 2001 and 2022, over 8,000 free-ranging cervids were tested in B.C., with no positive cases.

2. CWD surveillance in free ranging cervids by mandatory submissions: Head submission is mandatory in specific high-risk areas. Wildlife Management Units adjacent to the CWD-positive jurisdictions (Alberta and Montana) are considered high-risk and are the primary focus of CWD surveillance. In these areas additional measures and resources are employed to increase sample numbers and confirm disease status. Submission of hunter harvested deer in these areas became mandatory under a General Order (*BC Animal Health Act*) in 2019 and in 2020. In 2021, a condition under the General Hunting Licence requiring submission of harvested deer was implemented and achieved the same result of higher head submissions for testing. No CWD-positive cases were found. Mandatory Wildlife Management Units as of April 2023 include: 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-23, 4-24 and 4-25.
3. Weighted surveillance: Demographic risk factors, which may increase the likelihood of detecting CWD, are considered when planning and evaluating surveillance. Higher weight or relative risk is applied to the following samples in descending order of detecting CWD; clinical suspects, roadkill, adult male deer, adult female deer, deer under 2 years of age. Head submissions in B.C. consist mainly of hunter harvested adult deer, but higher weighted samples are prioritized for testing when available.
4. Reporting of cervids with clinical signs: Conservation Officers, wildlife biologists, and the public are asked (through outreach) to notify the B.C. Wildlife Health Program of any free-ranging cervid showing clinical signs of the disease. When appropriate, every effort is made to collect samples for testing from animals showing clinical signs of the disease.
5. Sample collection program: Freezer stations have been established in several areas of the province to facilitate submission of samples for CWD testing. Most freezers are in the Peace and Kootenay regions, however, several BC hunting or trapping groups and other partners around the province have donated and/or hosted additional freezers and the list of drop off locations continues to grow. Heads can also be submitted to most regional Wildlife or COS offices. A current list of freezer locations can be found at www.gov.bc.ca/chronicwastingdisease. Submission instructions and supplies are provided at each freezer location.
6. CWD Program coordinators: CWD Program coordinators have been contracted to assist with on-the-ground Program delivery in the Peace (since 2018), Kootenay (since 2019) and Okanagan (since 2021) Regions. CWD Program coordinators are individuals that develop relationships with communities, First Nations, local hunting and trapping groups and local businesses. The coordinators also deliver outreach, coordinate the local sample collection program, perform sampling, and provide

a local point of contact for the community. The value added by these individuals is essential to effective delivery of the Plan and program activities.

7. Incentives to improve numbers of head submissions: In 2016, the BC Wildlife Federation initiated the “Hats for Heads” program, to incentivize hunters to submit samples from harvested deer, elk or moose for CWD testing. Hunting groups and businesses are encouraged to purchase hats for distribution to members and customers in support of CWD efforts. In addition, local hunting organizations and clubs, several sporting goods suppliers, other businesses and individuals have donated items for raffle draws to incentivize sample submissions. These have been successfully run in the Peace Region in recent years and have boosted head submissions.
8. Accessing road killed cervids for CWD testing: Road killed cervids are an important sample in CWD surveillance and have often provided the first positive case in newly affected areas. 1000s of cervids are killed on the roads and removed/disposed of by highway and road crews. The CWD Program continues to work with BC trappers to access road kills that are collected for bait. This has helped to increase the number of road killed cervids tested in the Lower mainland, Thompson, Peace and Okanagan Regions, but very few road kills have been accessed in the high risk Kootenay region.
9. Sampling and diagnostics: Retropharyngeal lymph nodes are the standard sample collected from all cervid species. Additionally, tonsils are collected from deer species and the obex (brain stem) is collected from elk, moose, and caribou. Tissues are trimmed, fixed in formalin and submitted to the Canadian Wildlife Health Cooperative laboratory in Saskatoon for diagnostic testing by immunohistochemistry, where samples are visualized microscopically for the presence of CWD prions. Only cervids over one year of age are sampled because a reliable result requires time for prion accumulation that is not observed in young animals. A back-up sample from each animal is held frozen in B.C. for retesting in the event of a suspect result. Once submitted to the laboratory, results are expected within 3-6 weeks. Negative results are then posted to the CWD website where hunters can look up the result using the unique ID number provided upon submission.
10. Integrated CWD data platform: Data on B.C. CWD surveillance, testing and results is compiled into a provincial database, and a subset of the data is shared with national and cross-jurisdictional partners, including the Canadian Wildlife Health Cooperative database. A shared database allows national and international standardization and sharing of information, as well as providing accessible up-to-date information on CWD prevalence and distribution across Canada.
11. Evaluating surveillance effort: B.C. collaborates with veterinary epidemiologists, wildlife health experts, research collaborators and agency partners to set surveillance targets, evaluate surveillance effort and identify knowledge gaps in risk and likely points of disease entry. Currently B.C. is not meeting surveillance targets required for confidence in disease freedom in most areas of the province. Mandatory submission of harvested deer has provided reasonable confidence in the highest risk areas, however submission numbers have declined in these areas since mandatory submission was

implemented in 2019.

12. Increasing knowledge of cervid movement patterns: The Program collaborates with regional biologists and academic research scientists to determine regional cervid movements and potential corridors between B.C. and neighbouring jurisdictions. This information can be used to assist with risk assessment and focus surveillance in the highest risk areas.

4.2 Recommendations for 2023-25

1. Generate and evaluate surveillance data to assess risk and focus B.C. effort: New information from CWD surveillance in B.C. and elsewhere should be reviewed annually to assess risk, prioritize high-risk and vulnerable areas and focus/adjust surveillance as needed. Cervid movement patterns and risk to vulnerable populations should be assessed to predict potential entry points and pathways for disease incursion.
2. Increase outreach to promote surveillance: Continue to develop and deliver outreach to increase understanding of the purpose and value of surveillance. Messaging should be audience appropriate, focus on efforts to reduce risk, emphasize the importance of surveillance pre-detection and summarize basic response actions in the event of a positive diagnosis.
3. Increase CWD sampling capacity: Continue to deliver and expand CWD sample collection training for government staff, contractors, and interest groups. More qualified individuals in CWD sample collection will support increased frequency of sampling and reduce turnaround time in receiving results. This will support hunters and trappers in collecting their own samples from harvested or road killed animals and provide improved access to samples that may not have been submitted.
4. Reduce turnaround time on CWD results: Continue to investigate ways to reduce turnaround time on results. Work with potential CWD testing laboratories and other diagnostic centers to develop a long-term strategy which may include establishing CWD testing capability within B.C. Also continue to find efficiencies in head collection program and increase frequency of sampling and submission of samples.
5. Increase access to road killed cervids for CWD testing: Work with Ministry of Transportation and Infrastructure and highway contractors, particularly in the Kootenay Region, to develop system for accessing and testing road killed cervids as well as safe disposal of carcasses in higher risk areas. Continue to build and support relationships with BC trappers to access road kills that are collected for bait.

4.3 CWD Surveillance in Captive Cervids

The Ministry of Agriculture and Food along with B.C. game-farmers do not consider the species farmed in B.C. (reindeer and fallow deer) to be at high risk for CWD. There are no cervid farms in B.C.

currently enrolled in the CFIA CWD Voluntary Herd Certification Program. However, mandatory points of control, such as fencing guidelines, are in place. Although not specific to CWD prevention, fences do contribute to herd security. All captive cervids (over 1 year of age) slaughtered or that die should be sampled and tested for CWD by an accredited laboratory.

5.0 INITIAL RESPONSE TO A CWD-POSITIVE DIAGNOSIS

5.1 Initial Response Plan for CWD in B.C.

The goal of the initial response plan is to determine the scope of the disease on the landscape to inform management actions. The following section outlines the steps to be followed in the event of a CWD detection in a free ranging cervid population in B.C. or a significantly increased risk of CWD spread into BC, such as a CWD-positive animal in a high-risk location adjacent to the B.C. border. Response management will be led by the B.C. Wildlife Veterinarian supported by the Incident Management Team, the B.C. CWD Advisory Committee and CWD Working Groups. Communication among these groups will be critical.

If a sample from a free-ranging cervid from B.C. is determined (by a diagnostic laboratory) to be non-negative (or CWD-suspect), additional testing by a reference laboratory will be required to confirm CWD status. Source of sample, location of kill, species, age, cause of death (if hunter killed, the location of harvested meat) and other information pertinent to the situation will be gathered and documented. If confirmed CWD-positive, a 5-10 km zone will be delineated (with maps created) around the index case. This zone is called the Initial Response Area. Local expertise will be required to define the zone and include other habitat, landscape, and wildlife features. Targeted sampling will be required within the IRA to determine if there are additional CWD-positive animals. The information gathered during this phase will direct longer term actions further described in the next section.

Initial response objectives:

1. Determine CWD status and if additional positive cases.
2. Determine species affected and associated risk factors.
3. Determine local disease distribution and prevalence.
4. Reduce disease transmission and spread.
5. Attempt eradication.

Notice of non-negative result:

- The testing laboratory will notify the B.C. Wildlife Veterinarian of a non-negative result and will submit the sample to the Canadian Food Inspection Agency reference laboratory to be retested. Results from the Canadian Food Inspection Agency are expected within 5 business days. A back-up (frozen) sample held in at the regional office may be requested.
- The B.C. Wildlife Veterinarian will initiate an Incident Command System and notify the following of the non-negative result:
 - Canadian Food Inspection Agency District Veterinarian

- Chief Veterinary Officer
- Ministry of Forests executive, through the Fish and Wildlife Director
- Government Communication and Public Engagement
- Incident Management Team
- Hunter (if hunter harvested)

Notice of confirmed positive result:

- The Canadian Food Inspection Agency reference laboratory will notify the B.C. Wildlife Veterinarian, the Canadian Food Inspection Agency District Veterinarian, and the Chief Veterinary Officer of the confirmed positive result. As a reportable disease and the first CWD diagnosis in B.C., the Canadian Food Inspection Agency will report the CWD result to the public via their website and other platforms.
- The B.C. Wildlife Veterinarian will notify the same group as above as well as the B.C. CWD Advisory Committee and CWD Working Groups of the confirmed positive result.
- Ministry of Forests, through Government Communication and Public Engagement (GCPE), will be responsible for determining what public communications are appropriate (e.g. Information Bulletin, News Release, social media posting). Wildlife staff will work with GCPE to develop pre-approved communications products to reduce lag time in alerting the public.
- The B.C. Wildlife Veterinarian will initiate an epidemiological investigation to collect information pertinent to the situation. The appropriate Public Health authority will support as needed.
- The Incident Management Team (IMT) will convene to confirm membership of team, roles, resources, and information required, and to develop an Incident Action Plan for each operation period.
- The IMT will present each Incident Action Plan to the B.C. CWD Advisory Committee and CWD Working Groups for input and to Ministry of Forests executive and the relevant regulatory authorities for approval.

Incident Action Plan (*Proposed*):

First Operational Period – within 24 hours of notice of confirmed positive result.

- B.C. Wildlife Veterinarian to engage IMT and assign roles.
- Government Communications and Public Engagement to release Information Bulletin
- B.C. Wildlife Veterinarian to determine status of the CWD-positive carcass:
 - If hunter harvested, the status of the meat and remains, if the meat was consumed, and if processed by a butcher/meat cutter or taxidermist.
 - If the sample was collected from a clinical suspect, road killed or other source, determine method and location of disposal of carcass.
- IMT to collect and collate information on local cervid populations, habitats, and land use.
- Regional staff to visit site of harvest or collection and confirm land use, land ownership, safety hazards, cervid attractants, and other site-specific information.
- Regional wildlife biologists and other experts to provide:

- Map of the index case location including information above.
- Known cervid movement patterns including seasonal changes and timing.
- Potential disease transmission hot spots such as animal aggregations or high-density areas.
- Other risk factors for cervid populations.
- IMT to establish an Initial Response Area (IRA), defined as a 5-10 km radius from the index case (if precise location data is available). This area/buffer zone may vary in size depending on the landscape in the area.
- IMT to review existing surveillance data and determine surveillance objectives, targets, and appropriate methods if required.
- IMT to calculate target sample size (approximately 150 to 200 animals) using an estimated cervid population size within the IRA.
- B.C. Wildlife veterinarian to request that Chief Veterinary Officer issues Emergency General Orders under BC *Animal Health Act* that will:
 - Restrict carcass movement within the IRA.
 - Require specific carcass disposal methods within the IRA.
 - Prohibit and enforce all supplementary feeding of cervids within the IRA.
 - Require mandatory submission of hunter harvested cervids within the IRA.
 - Require mandatory submission of road killed cervids within IRA.

Second Operational Period

- IMT to confirm the presence of additional positives, species affected, spatial distribution and disease prevalence through additional testing if required. Animals can include any cervid from hunter harvest, road kills, euthanized free-ranging herds or urban deer.

Third Operational Period

- IMT to receive and interpret sampling results and determine if additional CWD-positive cases are present. Results are expected within 3 weeks of laboratory submission.
- IMT to report the species affected, spatial distribution and prevalence of CWD in the IRA to the B.C. CWD Advisory Committee and CWD Working Groups.
- IMT to evaluate risk and determine next steps through consultation with the B.C. CWD Advisory Committee and CWD Working Groups.
Next steps to be considered:
 - Increased hunting opportunities (i.e. special hunt)
 - Targeted removals/sampling
 - Expanded surveillance
 - Adapted harvest strategies
- Government Communications and Public Engagement to issue updated Information Bulletin.

5.2 Current CWD Response Planning Activities

1. Incident Command System - Tabletop Exercise (January 2021): A Tabletop Exercise was led by the BC Wildlife Health Program with representatives from Ministry of Forests, Ministry of Agriculture and Food, Canadian Food Inspection Agency and the Conservation Officer Service. to discuss the Incident Command System framework and roles as it can apply to a CWD response effort. The group also reviewed legislative tools and authorities, decision processes, information gaps and proposed early response activities. Several outputs from this exercise have been incorporated into this updated version of the Plan.
2. Cross-jurisdictional CWD Working Groups: The B.C. Wildlife Veterinarian and CWD Program lead are members of the Western Association of Fish and Wildlife Agencies CWD Working Group and other cross-jurisdictional working groups that promote information and experiential sharing to assist and guide surveillance, response, and management efforts across North America.

5.3 Recommendations for 2023-25

1. Confirm options for emergency funding to support response effort: Work with the Ministry of Forests, the Ministry of Land, Water and Resource Stewardship, the Ministry of Environment and Climate Change and the Ministry of Agriculture and Food to investigate and confirm options for emergency funding (that can be accessed quickly) to support initial CWD response and on-the-ground activities. The estimated budget need is \$100,000.00.
2. Review CWD Management Actions: Review and synthesize CWD response and management actions applied elsewhere. Investigate scenarios, factors and outcomes of different management actions and describe options for BC specific scenarios. Apply these findings to support decision making and outreach in B.C.
3. Approve Terms of Reference for the B.C. CWD Advisory Committee and Regional Working Groups: The Terms of Reference (Appendix 4) outlines roles and responsibilities of the membership to support delivery of the Plan.
4. Identify epidemiological expertise to advise on response actions: Appropriate veterinary epidemiological expertise is not available in-house. Canadian Food Inspection Agency has provided expertise with 2 reports produced in 2022, however, contracted expertise should be sought to support expanded efforts in 2023-25.
5. Deliver Incident Command System tabletop exercises with B.C. CWD Advisory Committee and CWD Working Groups: Review potential CWD scenarios in B.C., early response activities, proposed Incident Action Plans and potential management options, and request input from partners and stakeholders.
6. Establish Incident Management Team: Members of an Incident Management Team should be identified and engaged as soon as possible. Representation from local First Nations as well as regional wildlife and enforcement staff from the highest risk area (i.e., Kootenay Region) is essential.

7. Prepare notice of CWD-positive communication materials for pre-approval: Prepare materials (i.e., Information Bulletin) for pre-approval by Government Communications and Public Engagement. Identify communication channels with partners.

5.4 CWD-positive Case in a Game-Farmed or Zoo Cervid

In the event of a CWD-positive diagnosis in a game-farmed cervid, Canadian Food Inspection Agency involvement will depend on the herd certification status. In general, the following steps will be carried out:

- The non-negative sample will be retested by the Canadian Food Inspection Agency CWD reference laboratory to confirm the presence of CWD prions in the submitted tissues.
- The Canadian Food Inspection Agency Animal Health Veterinary Officer will be notified.
- The Chief Veterinary Officer of B.C. will be notified of the result of the retest and will have the lead role in response.
- The Chief Veterinary Officer will report the CWD-positive result to the B.C. Wildlife Veterinarian who will then notify the B.C. CWD Advisory Committee and CWD Working Groups.
- Canadian Food Inspection Agency will coordinate public communications and press releases.
- The B.C. Wildlife Veterinarian will lead efforts to:
 - Determine the risk of CWD to free-ranging cervids in and around the affected and trace-out facilities.
 - Implement surveillance in the area to determine CWD status.
 - Coordinate other mitigation efforts related to wildlife.

The response to a CWD-positive cervid in a zoo in B.C. will require a collaborative risk assessment with the zoo owner and manager as well as involved agencies. Many of the response steps outlined above may be implemented but actions will be delivered on a case-by-case basis.

6.0 CWD MANAGEMENT IN B.C.

Initial response activities and targeted sampling will generate critical information that will be required to determine ongoing management of CWD in B.C. A CWD management plan for B.C. will be based on the current state of knowledge of management tools and an assessment of management actions applied elsewhere. The management plan will be informed by expert advice and resources such as the Western Association of Fish and Wildlife Agencies *Recommendations for Adaptive Management of Chronic Wasting Disease in the West* and will be developed and delivered collaboratively with the B.C. CWD Advisory Committee and CWD Working Groups.

7.0 COMMUNICATIONS

The goal of CWD communications is to improve knowledge of the disease, raise awareness and reduce risk through informed behaviour of hunters, trappers, ranchers, wildlife professionals and the public. CWD is a complicated disease and its management is challenging. Consistent and understandable communication on the agent, disease effects, distribution, preventative measures and regulations, surveillance activities and testing (including results), and ongoing research will assist with understanding risks and how to reduce them. Development of communications content is informed by input from partners and should be presented on multiple platforms and formats to reach all British Columbians. Government and the Program relies heavily on partners to disseminate information to achieve effective delivery of the messaging.

7.1 Current CWD Communications Activities

1. Internal communication: The Program collects and uses information and resources provided by government staff (Wildlife Health, regional, GCPE), CWD coordinators, and laboratories and posts that information on the B.C. CWD website (www.gov.bc.ca/chronicwastingdisease). In addition, the Program provides CWD-specific communication material through virtual and in-person presentations, training workshops and information sessions, printed material (posters, rack cards, banners), online resources (fact cards, PowerPoint presentations, videos), highway signs, Information Bulletins, media interviews, phone, and email.
2. External communication: The Program relies on partners to assist in disseminating CWD information and resources through external websites, social media platforms, newsletters, magazines, signage, and community events.
3. CWD Public Health Working Group: In 2019, representatives from the B.C. Centre of Disease Control (BCCDC), the First Nations Health Authority (FNHA) and Interior Health were invited to form the BC CWD Public Health Working Group. This Working Group meets annually to review current evidence of human health risk and develops consistent messaging across agencies including communication material and website content.
4. Research updates: Extension of new CWD research is provided to the CWD Advisory Committee, Regional Working Groups, and others as available in email updates, presentations and the BC CWD website.

7.2 Recommendations

Despite strong communication activities, the CWD Program is aware of a lack of knowledge about CWD in many sectors and communities. Further effort is required to increase awareness of risk factors, preventative measures, regulatory requirements and proposed response actions through:

- Partnering with First Nations and stakeholder organizations to develop and deliver effective audience-specific materials.
- Expanding online and social media presence through partner networks and platforms.

7.3 Communication Following a Diagnosis of CWD

If CWD is detected in B.C., the B.C. Wildlife Health Program of MOF will be the primary source of information regarding the disease in free ranging wildlife populations in the province. Communication must be transparent and timely to report results, risk assessments and actions to agencies, membership of Advisory Committee and working groups, external partners, stakeholders, and the public. Communication materials with appropriate, clear, and consistent messaging for the scenarios discussed above will be prepared and approved. The CWD Advisory Committee and Working Groups will advise on messaging and assist in dissemination of communications as needed.

Communication materials will include the following information:

- CWD-positive species and age (if known), date of sample collection, date of test result, collection location (if known, MU specific)
- General response objectives and initial response activities

Communication materials will not include:

- Hunter information (if hunter harvested)
- Management actions beyond initial response

A CWD Communication Plan must be developed collaboratively by Ministry of Forests and GCPE, with input and support from the B.C CWD Advisory Committee and CWD Working Groups. The Communication Plan should delineate content, methods of distribution, how and who will deliver, and timing of releases and should include an initial response flow chart, draft communication products (i.e. Information Bulletin), appropriate social media platforms and forums and a Frequently Asked Questions page.

8.0 CWD PROGRAM BUDGET

While a mix of funding from ministry sources, external partners, and other programs (including Together for Wildlife Strategy) currently allows for basic CWD program delivery (CWD Program expenditures for 2022-23 are summarized in Appendix 2), additional resources will be required in the event of CWD diagnosis in B.C. Areas of note detailed below:

1. Initial Response to CWD-positive cervid: To deliver a rapid and coordinated response to a positive diagnosis in a free-ranging cervid in B.C., access to emergency funding for operational costs, travel and contracted resources will be required. Estimated cost: \$100,000.00.
2. In-province, accredited laboratory CWD testing: CWD samples are shipped out of province and are considered a lower priority in that jurisdiction due to their own sample volume. This delays results leading to complaints and confusion, particularly by hunters who wish to consume their harvested animals. Delayed results also jeopardize timely and effective response actions. Resourcing an accredited lab within B.C. would improve efficiency, should a suitable location and partnership be identified. This facility would likely require, at minimum, a cost-share arrangement in equipment

purchase, staffing and operating costs. Estimated cost: \$250,000.00 (capital investment of equipment), \$70,000 (annual operating cost).

3. Safe disposal of CWD-risk materials: There is currently no capacity or infrastructure in B.C. for the preferred method (i.e., incineration) recommended for the safe disposal of CWD-risk materials. Authorization under the Environmental Management Act is required and this process has been investigated. However, challenges with necessary approvals and associated costs have proven to be prohibitive. This has been compounded by reduced capacity of the Ministry of Agriculture and Foods incineration facility following the 2021 floods. Alternative methods of disposal (i.e., composting, centralized disposal sites, alkaline hydrolysis) and associated cost should be investigated given that the volume of CWD-risk material will grow significantly following a CWD detection in B.C.

9.0 CONCLUSION

As a fatal infectious disease of cervids, CWD is of increasing importance to wildlife managers, public health officials, agriculture interests, national and international trade, and communities that depend on a healthy and sustainable wildlife resource. There is no proven vaccines or treatments available and strong evidence that CWD will persist in the environment. Management policies, regulations, surveillance and outreach efforts are in place but must be expanded and strengthened in response to new information and emerging risk. B.C. must do everything possible to prevent the establishment and spread of CWD in the province and be prepared so that if CWD enters B.C., an effective response strategy can be implemented immediately.

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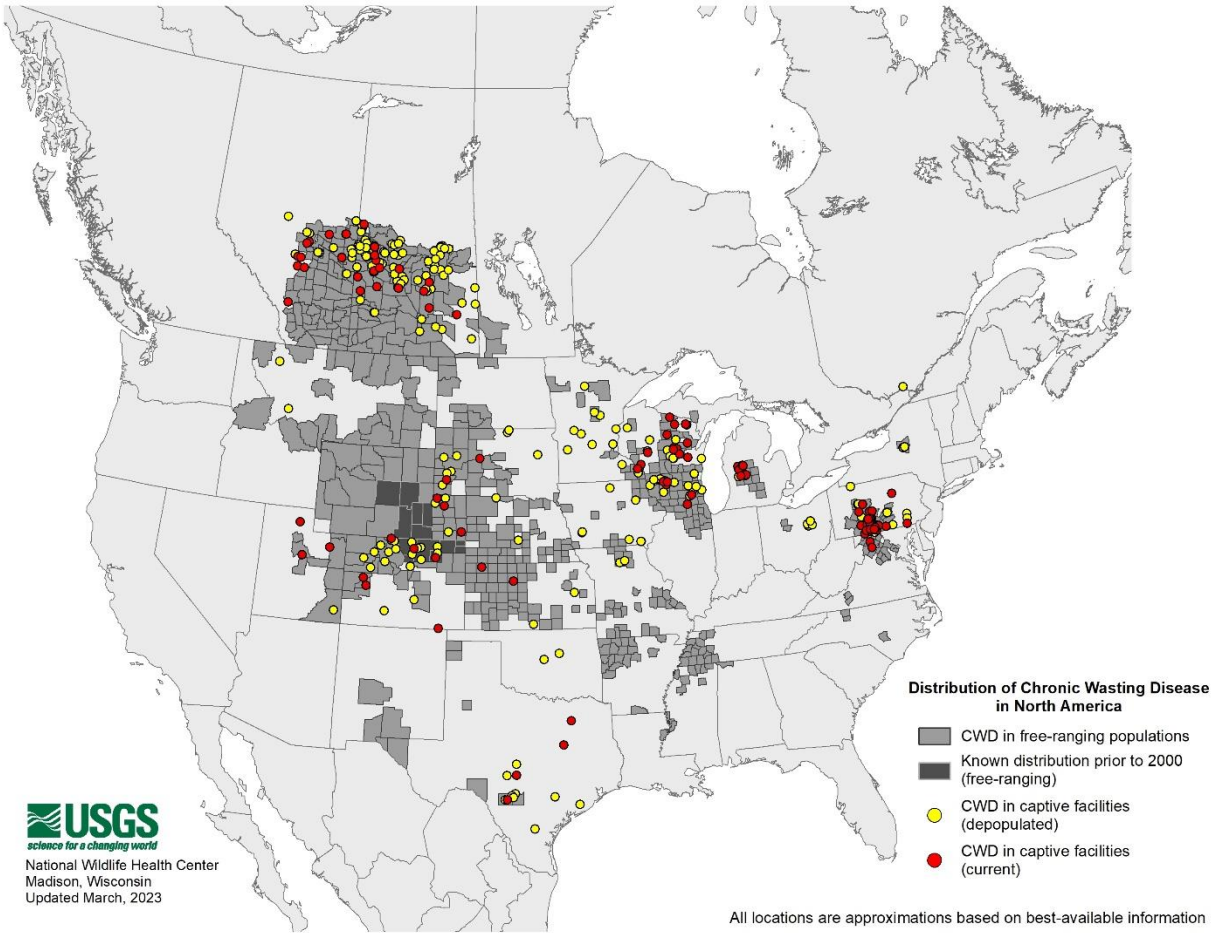
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APPENDIX 1: CWD DISTRIBUTION IN NORTH AMERICA



Accessed March 2023: <https://www.usgs.gov/media/images/distribution-chronic-wasting-disease-north-america-0>

APPENDIX 2: CWD PROGRAM BUDGET 2022-23

CWD PROGRAM BUDGET 2022-23	FUNDING SOURCE		EXPENDITURE
Expenditure Detail	T4W	BC FOR	TOTAL
Contracts – CWD Program Coordinators	75,000.00		75,000.00
Diagnostics - University of Saskatchewan/CWHC	40,000.00		40,000.00
Travel – CWD sampling and delivery of outreach	15,000.00		15,000.00
Outreach materials - Printing, video production, signage	5,000.00		5,000.00
Operational - Sampling supplies, freezers, disposal	15,000.00		15,000.00
Salary – Wildlife Health Biologist (0.8 FTE)		60,000.00	60,000.00
TOTAL	150,000.00	60,000.00	210,000.00

APPENDIX 3: BMPS FOR TRANSPORT, STORAGE AND DISPOSAL OF CWD MATERIALS

TRANSPORT, STORAGE AND DISPOSAL OF CWD CONFIRMED OR HIGH-RISK MATERIALS - Best Management Practices for BC Government Staff and Contractors

Background

The Best Management Practices (BMPs) are designed to reduce the risk of CWD introduction to B.C. through appropriate carcass and high-risk animal material handling and disposal. It is intended for government staff (i.e. wildlife and enforcement staff) and contractors (i.e. CWD coordinators) that assist with the transport, storage, and disposal of CWD confirmed or high-risk materials.

CWD confirmed or high-risk materials may include cervid parts, processing waste from meat cutting or wrapped meat. The B.C. CWD or Wildlife Health Program will be notified of CWD-positive (confirmed) samples from hunter harvested cervids originating from outside B.C. by the jurisdiction of kill if submitted for testing. Material may be determined to be high-risk if it originated from a known CWD-positive location, even if not tested. If appropriate tissues are available, samples may be submitted for testing by B.C.

CWD confirmed or high-risk materials are referred to hereafter as “CWD material”. Record keeping of CWD material within B.C. is maintained by the B.C. CWD Program. Status or changes to transport, storage, and disposal of CWD material should be communicated to the B.C. CWD Program (250-751-3219 or cait.nelson@gov.bc.ca).

Transport

CWD material must be packaged securely to prevent leakage or access by scavengers (i.e. ravens) when received by staff or contractors and during handling and transport. If the hunter transports CWD material, they must be advised of risk and be given the following instructions:

- All CWD material must be double-bagged in plastic, sealed (i.e. tied or zap-strap), labelled as **CWD material** with, at a minimum, the date and the hunter’s name and phone number.
- CWD material must be kept in a secure, enclosed space (i.e. within a truck canopy, or cooler with a tight-fitting lid) during transport.
- It is preferred that CWD material is frozen prior to transport to limit fluid leakage.
- If CWD material is not frozen and may leak, use plastic sheets, tarps, or coolers to prevent contamination of surfaces (i.e. truck beds). Plastic sheets, tarps or coolers must be disposed with the CWD material or decontaminated with a 5-minute soak of 40% bleach solution.

Storage

Confirm CWD material is double-bagged in plastic, sealed (i.e. tied or zap-strap), labelled as **CWD material** with, at a minimum, the date and the hunter’s name and phone number. If CWD material cannot be disposed of immediately, it can be stored temporarily in a secure government-operated freezer with limited access (government staff only), preferably in a locked building. CWD material can be stored frozen until disposal is arranged.

Disposal

Destruction or inactivation of CWD prions is difficult, and few treatments have been documented as completely successful. In addition, there are currently no quality assurance or quality control methods to ensure successful prion inactivation. The following options are reported to reduce the amount or activity of infectious prion material (*Technical Report on Best Management Practices for Surveillance, Management and Control of Chronic Wasting Disease (2018)*):

- **Incineration** of carcasses in an Environmental Protection Agency (USA)-approved conventional incinerator, air curtain incinerator, or cement kiln. After incineration, ashes should be buried in an active, licensed landfill at a depth that meets local and state/provincial/territorial regulations to prevent scavenging or contamination of groundwater. Incineration of carcasses should be at a minimum secondary temperature of 1000°C (1832°F) (Taylor and Woodgate 2003). Incineration may not be a culturally acceptable practice for disposal by certain First Nations groups.
- **High-pressure alkaline hydrolysis** of carcasses followed by burial of the treated material in an active, licensed landfill at a depth that meets local and state/provincial/territorial regulations. Alkaline hydrolysis uses a pressurized vessel that exposes the carcass or tissues to 1 N NaOH or KOH, heated to 150°C for a minimum of 3 hours (Taylor and Woodgate 2003, Richmond et al. 2003).
- **Composting** of carcasses is an efficient method of disposal for some diseases with proper management. While composting of carcasses does not reliably inactivate all prions, research does indicate that it can significantly reduce prion infectivity (Xu, 2013, 2014). Further research into optimizing methods of composting to inactivate prions is warranted, although basic precautions such as controlling run-off during the composting process and ensuring that the composted material is not spread on the landscape are suggested.
- **Centralized sites/methods** for disposal of CWD-positive or high-risk carcasses. Several areas have established disposal sites for carcasses potentially contaminated with CWD. The agreement between the Utah Division of Wildlife Resources and the Utah Environmental Protection agency (available on request) is an excellent example of interagency cooperation on disposal. Each state or province should investigate the possibility of similar agreements and centralized disposal sites and methods (IAFWA, 2006).
- **Approved licensed landfills** offer one of the most economically feasible options for disposal of carcasses and parts, particularly in high volumes. While disposal via landfill may not eliminate infectious prions, carcass parts disposed of in a landfill would be inaccessible to cervids and may functionally contain the CWD prion (Jacobson et al., 2009). It is important that carcasses are properly covered after disposal in a landfill to prevent scavenging.

Additional Information

There are many factors to be considered related to carcass disposal. In areas with limited or no detection of CWD, reducing the risk of CWD introduction to new areas is imperative. Carcass disposal options need to be practical, cost-effective, and sustainable. Multiple carcass disposal options may be considered based on risk and feasibility. For example, if incineration is not an option in a particular area, deep burial at landfill may be appropriate. As many landfills begin to close or discontinue accepting carcasses, options for efficient disposal may become limited. Lack of access to landfills for disposal of large numbers of vehicle-killed animals or access for individual hunters for disposal may lead to inappropriate disposal of carcasses onto the landscape and facilitate disease transmission. Proactive, long-term disposal strategies should be developed and implemented to support increasing demand and need for capacity.

Once CWD is confirmed in an area, authorities recommend first testing individual animals for prion protein by IHC or other official test and delaying disposal until test results are obtained, however this may not be practical. Subsequently, disposal options involving incineration, alkaline hydrolysis with burial of the treated materials can be used for the positive animals, and simple carcass burial in a landfill or onsite may be used for the negative animals. This works well for animals being tested but considering the large volume of harvested and road-killed animals that are never tested and may be disposed by hunters, assuring that viable options are available for disposal at minimal cost is essential.

Disposal in British Columbia:

Options for disposal of CWD material in B.C. include disposal by deep burial at approved landfills and incineration at one government facility in Abbotsford. **Incineration is considered the best option.** If transport of CWD material to Abbotsford is not feasible or that incinerator is unavailable, deep burial at a landfill is permitted. The B.C. CWD Program, with support from regional partners, is investigating adding capacity with additional incineration facilities at key locations in the province.

APPENDIX 4: TERMS OF REFERENCE FOR B.C. CWD ADVISORY COMMITTEE AND CWD WORKING GROUPS

TERMS OF REFERENCE – B.C. CWD Advisory Committee and CWD Working Groups

PURPOSE:

The purpose of this Terms of Reference is to delineate the roles and responsibilities of the B.C. CWD Advisory Committee and CWD Working Groups and to provide a framework for incorporating the values and knowledge of partners into the development and delivery of the B.C. CWD Plan, here-after referred to as “the Plan”.

BACKGROUND:

Chronic Wasting Disease is a complex and challenging issue facing wildlife managers and conservation groups across North America. A positive diagnosis of CWD in B.C. could have far reaching impacts on hunting practices, food security, wildlife related economies and wildlife conservation. Therefore, an effective plan must be developed in collaboration with partners from a range of perspectives, areas of expertise and jurisdictional authorities. A B.C. CWD Advisory Committee was formed in 2006 to support provincial level program activities. Two CWD Working Groups were formed in 2007 in the Peace and Kootenay Regions to support enhanced outreach and surveillance in the higher risk areas. The B.C. CWD Advisory Committee and the CWD Working Groups will here-after be referred to as “the Committees”.

SCOPE:

The Committees are not decision-making bodies. Committee members will recommend priorities, provide strategic advice, and offer policy guidance to Government in the following areas:

- Prevention
- Surveillance
- Response
- Communications

PARTICIPANTS:

The Committees include representatives from Provincial and Federal agencies, Indigenous Governments and partners, public health experts, non-government organizations, science advisors, the Provincial Hunting and Trapping Advisory Team, CWD experts and Program representatives and BC CWD Program contractors. The Committees are co-chaired by the B.C. Wildlife Veterinarian and the CWD Program lead/Wildlife Health Biologist. New committee members may be added as needed.

DELIVERABLES:

The Committees will:

- Provide input on the Plan.
- Develop and recommend strategies and actions.
- Identify specific responsibilities and roles of each agency or group.
- Aid in development and dissemination of outreach and communications.

- Support the Ministry of Forests in Plan delivery.
- Agree to the terms in this document.

The co-chairs will:

- Lead the Committees, assuming all duties of a chair (Agenda, minutes).
- Seek and confirm appropriate membership for the Committees.
- Request independent expertise, as needed.
- Report on CWD activities and results to the Committees at least quarterly, or as needed, by email, conference calls and an annual meeting.
- Lead the development and implementation of supporting documents.

EXPENSES:

Committee members will volunteer their time and be responsible for any travel costs that may be incurred to attend meetings (this will be minimal as meetings will be held in region or virtually as much as possible).

TIMELINES:

- The Committees will convene annually for a face-to-face meeting and will be asked to provide input on the Plan for the coming year.
- The Committees will attend conference calls as needed.
- Additional meetings may be called at the discretion of the Chair and/or at the request of committee members.
- The Plan will be updated every 3 years and the Committees will be asked to review and approve.

CONDUCT:

- We encourage shared learning opportunities.
- We will respect the credibility of published and peer reviewed scientific research.
- We will respect and incorporate local and Indigenous Knowledge.
- We will consider the work of other jurisdictions.
- We engage in respectful dialogue, communication, and documentation.
- We respect timelines, accountability, and act with transparency.

CONFIDENTIALITY:

Committee members will respect confidentiality of draft documents, plans, policy, regulation proposals and discussions and will not circulate or communicate outside of the Committees until information or documents have been finalized or approved by the chair.

MEMBER ORGANIZATION	ROLES AND RESPONSIBILITIES
Ministry of Forests – BC Wildlife Health Program	<ul style="list-style-type: none"> • Lead delivery of the BC CWD Plan in prevention, surveillance, and response planning • Provide briefings and information for decision making (within Ministry of Forests) • Manage program funding and contracts • Coordinate and deliver outreach • Coordinate sample collection and testing • Wildlife Program staff to develop policy and regulatory tools under the <i>BC Wildlife Act</i> • Wildlife Program staff to provide expertise related to wildlife and wildlife health management • Wildlife Director to approve the BC CWD Plan
Ministry of Forests – Fish and Wildlife Branch	<ul style="list-style-type: none"> • Develop policy and regulatory tools under the <i>BC Wildlife Act</i> • Provide expertise related to wildlife and wildlife health management • Wildlife Director to approve the BC CWD Plan
Ministry of Forests – Regional Wildlife Staff	<ul style="list-style-type: none"> • Provide expertise related to wildlife populations and management • Provide input on the BC CWD Plan • Provide input and support for regional delivery, as needed
Ministry of Agriculture and Food	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Under authority of the Chief Veterinary Officer (CVO), participate in decisions and implement legislative tools (<i>BC Animal Health Act</i>) if required • Manage captive cervid farms in B.C. • Assist with sampling and development of in-province diagnostics as required
Ministry of Environment and Climate Change – Conservation Officer Service	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Support on-the-ground surveillance and response activities • Deliver enforcement activities associated with CWD regulations, as needed • Disseminate information to hunters through day-to-day activities • Submit samples of seized and/or euthanized cervids for testing
Ministry of Transportation and Infrastructure	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Assist with outreach and the development of signage on roads • Liaise with highway contractors in accessing road killed animals for testing

BC Centre for Disease Control	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Provide expertise related to human health and CWD • Assist with information sharing and outreach • Participate on the Public Health CWD Working Group
First Nations Health Authority	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Provide expertise related to human health and CWD • Assist with information sharing and outreach • Participate on the Public Health CWD Working Group
Indigenous Governments and Partners: <ul style="list-style-type: none"> - St'át'imc Government Services - Wildlife Stewardship Council 	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Assist with information sharing and outreach • Support on-the-ground activities/initiatives, as needed
Canadian Food Inspection Agency	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Provide information and updates on Federal CWD programs/activities • Provide confirmatory testing on suspect cases
Parks Canada	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Provide information and updates on Parks Canada CWD programs/activities
Non-government Organizations: <ul style="list-style-type: none"> - BC Wildlife Federation - Guide Outfitters Association of BC - BC Trappers - Backcountry Hunters and Anglers - Hunters for BC - Wild Sheep Society of BC - BC Cattlemen's Association 	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Assist with information sharing and outreach • Support on-the-ground activities/initiatives, as needed
Science Advisors <ul style="list-style-type: none"> - University of BC Okanagan - University of Northern BC - Canadian Wildlife Health Cooperative - Environment Canada and Climate Change 	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Provide relevant expertise related to CWD, epidemiology, disease, and wildlife management • Collaborate and advise on research
Provincial Hunting and Trapping Advisory Team	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Advise on policy and regulatory changes related to CWD
CWD Experts and Program Representatives: <ul style="list-style-type: none"> - Alberta Environment and Parks - Montana Fish, Wildlife and Parks - Idaho Fish and Game 	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Provide information and updates on CWD Programs • Provide expertise related to CWD and disease management
BC CWD Regional Program Coordinators	<ul style="list-style-type: none"> • Provide input on the BC CWD Plan • Assist with on-the ground operations, sampling, and outreach • Maintain freezer locations and regional contacts

End of Document.