Appendix A.

Utah Division of Wildlife Resources
Chronic Wasting Disease Management Plan

Goals of the plan:

The goals of this plan are to provide adaptable directions for management and prevention of spread of Chronic Wasting Disease (CWD) in free-ranging deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), and moose (*Alces alces*) in Utah. The disease has been present in Utah for at least two decades, and eradication, although desired, is likely not realistic at this point in time. Specific objectives addressed in this plan are to 1) reduce the rate of spread and prevalence of Chronic Wasting Disease in Utah; 2) provide guidelines for response to detection of new infection foci; 3) communicate with the public and participate in scientific research.

Background:

Chronic Wasting Disease (CWD) is a neurodegenerative disease of deer, elk, moose, and caribou caused by infectious proteinaceous particles called prions (Haley 2015). The disease is classified as a transmissible spongiforme encephalopathy (TSE) similarly to bovine spongiforme encephalopathy in cattle, scrapie in sheep, and kuru and Creutzfeld Jacob Disease in humans (Haley 2015). Incubation time from infection to clinical signs averages at approximately 16 months (Williams & Miller 2002). Clinical symptoms in affected animals can vary but can include progressive weight loss, behavioral changes, ataxia, excessive salivation, head tremor, aimless wandering, and always results in death of the affected animal (Williams 2005; Haley 2015). In infected animals, prions are predominantly present in nervous and lymphoid tissues, but have also been detected in antler velvet, muscle, saliva, blood, intestinal tract, bladder, urine, and feces (Henderson *et al.* 2015; Angers *et al.* 2006; Mathiason *et al.* 2006; Angers *et al.* 2009; Haley *et al.* 2011). Transmission can occur directly from animal to animal via contact with infectious body fluids (Haley 2015), however, prions are highly resistant in the environment and environmental contamination may contribute to the spread of the disease (Miller 2004; Miller *et al.* 2004; Haley 2015).

Chronic wasting disease can have consequences for both free ranging and captive populations. Studies have shown that CWD can cause declines in free-ranging deer populations, especially with high disease prevalence (Wasserberg *et al.* 2009; Edmunds *et al.* 2016) and environmental persistence (Almberg *et al.* 2011). Survival studies in deer and elk utilizing radio collars showed that CWD infected animals have lower survival, consequently leading to lower population growth rates (Miller *et al.* 2008; Monello *et al.* 2014; Geremia *et al.* 2015; DeVivo *et al.* 2017). Chronic wasting disease continues to be a major concern for the domestic cervid industry.

To date, CWD has been detected in multiple US states and Canadian provinces (for a map of the current distribution visit http://cwd-info.org/map-chronic-wasting-disease-in-north-america/), as well as in Norway (Benestad *et al.* 2016), Finland, and South Korea (Sohn *et al.* 2002; Kim *et al.* 2005). The disease has mainly spread to new areas via natural animal migrations, translocations of cervids, and escape of CWD infected cervids from captive facilities (Miller & Fischer 2016). Other risk factors may include transport of infected carcasses or animal products such as urine, saliva, feces etc., and artificially concentrating animals through baiting or feeding (Miller & Fischer 2016).

Chronic Wasting Disease in Utah:

The Utah Division of Wildlife Resources (UDWR) first began conducting CWD surveillance in 1998 upon the request of the Center for Disease Control and Prevention. The first case of CWD was found in a hunter-killed buck taken near Vernal in Uinta County in 2002. To date, 92 mule deer and two elk have tested positive for CWD in 6 Wildlife Management Units (WMU) statewide (Figure 1). The highest prevalence in Utah is found in WMU 13 in the La Sal Mountains where the proportion of CWD positive samples have varied between 0 – 8% since 2003 with an increasing trend (Table 1, Figure 2). The proportion of CWD positive samples have varied between 0 and 2% in the other positive WMU's (8, 9, 11, 14, 16) but also with an increasing trend (Table 1, Figure 2). The disease appears to be slowly spreading. In the fall of 2016 and 2017, two deer tested positive near Myton, which is located in the western part of unit 9 and approximately 40 miles west of previously positive animals, and in 2018, another deer tested positive within unit 11 near this area. In the fall of 2017, one deer tested positive near Kenilworth, also within unit 11. This deer was harvested close to CWD positive deer within unit 16. To date, only two elk and no moose have tested positive for CWD in Utah.

Domestic elk ranching is administered through the Utah Department of Agriculture and Food (UDAF). In 2014, a domestic bull elk killed on a hunting ranch in Liberty in northern Utah tested positive for CWD. This elk was traced back to a domestic elk facility near Blanding in southeastern Utah. The facility was depopulated, and 38% of the animals tested CWD positive. Spread of CWD from domestic to wild cervids and from free-ranging to captive populations continues to be a significant concern.

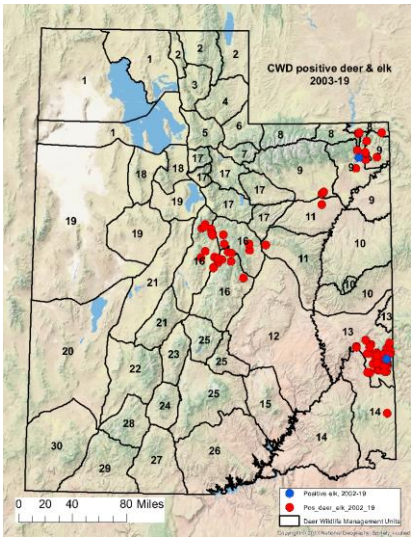
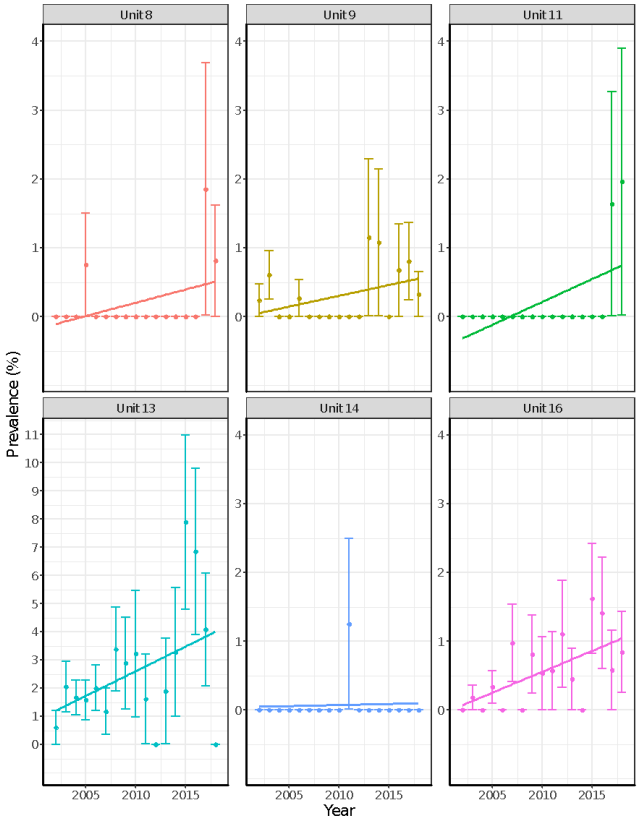


Figure 1: Locations of CWD positive deer and elk in Utah from 2002-2019.

Table 1. Total number of samples collected (Total) and number (Pos) and percent positive (%) mule deer in CWD positive units in Utah from 2002 – 2019. In addition to the data shown in the table, two elk have tested positive for CWD during this time period, one in Unit 9 and one in Unit 13.

	Unit 8			Unit 9			Unit 11			Unit 13			Unit 14			Unit 16		
Year	Total	Pos	%	Total	Pos	%	Total	Pos	%	Total	Pos	%	Total	Pos	%	Total	Pos	%
2002-03	138	0	0.00	423	1	0.24	18	0	0.00	166	1	0.60	136	0	0.00	16	0	0.00
2003-04	66	0	0.00	495	3	0.61	125	0	0.00	244	5	2.05	175	0	0.00	549	1	0.18
2004-05	102	0	0.00	563	0	0.00	85	0	0.00	420	7	1.67	226	0	0.00	549	0	0.00
2005-06	133	1	0.75	493	0	0.00	78	0	0.00	316	5	1.58	223	0	0.00	594	2	0.34
2006-07	94	0	0.00	375	1	0.27	71	0	0.00	300	6	2.00	72	0	0.00	392	0	0.00
2007-08	75	0	0.00	151	0	0.00	37	0	0.00	171	2	1.17	133	0	0.00	308	3	0.97
2008-09	62	0	0.00	251	0	0.00	32	0	0.00	148	5	3.38	93	0	0.00	210	0	0.00
2009-10	62	0	0.00	254	0	0.00	34	0	0.00	104	3*	0.03	87	0	0.00	247	2	0.81
2010-11	57	0	0.00	391	0	0.00	34	0	0.00	62	2	3.23	59	0	0.00	187	1	0.53
2011-12	56	0	0.00	304	0	0.00	52	0	0.00	62	1	1.61	80	1	1.25	175	1	0.57
2012-13	60	0	0.00	93	0	0.00	11	0	0.00	41	0	0.00	107	0	0.00	181	2	1.10
2013-14	73	0	0.00	87	1	1.15	21	0	0.00	53	1	1.89	55	0	0.00	223	1	0.45
2014-15	70	0	0.00	93	1	1.08	29	0	0.00	61	2	3.28	86	0	0.00	239	0	0.00
2015-16	74	0	0.00	179	0	0.00	28	0	0.00	76	6	7.89	63	0	0.00	247	4	1.62
2016-17	104	0	0.00	148	1	0.68	9	0	0.00	73	5	6.85	84	0	0.00	213	3	1.41
2017-18	54	1	1.85	249	2	0.80	61	1	1.64	98	4	4.08	97	0	0.00	172	1	0.58
2018-19	123	1	0.81	308	1	0.32	51	1	1.96	24	0	0.00	64	0	0.00	238	2	0.84
Total	1403	3	0.21	4857	11	0.23	776	2	0.26	2419	52	2.15	1840	1	0.05	4740	23	0.49

Figure 2: Trends of apparent CWD prevalences [(numbers positive/ numbers tested)*100] in mule deer in CWD positive units 2002–2018. Note the different scale in unit 13.



Risk factors for spread of CWD and options for management:

Once CWD is established in a population it is unlikely to be eradicated. Currently, there are no effective treatments or vaccines available for CWD. At the time of writing of this plan, Utah first detected CWD in its cervid population almost 2 decades ago. The goal of CWD management in Utah is therefore *to slow the spatial spread of the disease*, *to prevent further increase in CWD prevalences in affected areas*, and *detect new infection foci as early as possible*. As deer are more susceptible to CWD than elk and moose, CWD management actions and sampling efforts will therefore primarily target mule deer populations at this time, as a reduction in CWD prevalence in mule deer likely will reduce the spread of the disease to other cervid species as well.

Chronic wasting disease prions can persist in the environment (Almberg *et al.* 2011), and environmental contamination may contribute to transmission of the disease within infected areas. Deliberate, localized reduction of population densities ("hot-spot culling) has been utilized by multiple states and may be effective in reducing CWD prevalences locally. However, sustained actions are needed in order to achieve long term effects, and these efforts have therefore yielded mixed results (Miller & Fischer 2016; Wolfe 2018).

Male deer are more likely to be infected than females (Miller *et al.* 2000; Grear *et al.* 2006; Rees *et al.* 2012), and statistical modeling has shown that harvest management may be most effective when focused on antlered deer (Jennelle *et al.* 2014; Potapov *et al.* 2016). Bucks over 4 years of age are more likely to be infected with CWD (Miller & Conner 2005), and targeting older age bucks may therefore be a tool for reducing CWD prevalences. Hunts later in the hunting season and during the rut appear to be especially effective in increasing adult male harvest and may therefore be an effective tool for targeting this age group. Research is currently underway to better understand the effect of different harvest strategies on CWD prevalences and spread.

Other risk factors for spread of CWD include movements of animals and animal parts (Williams & Miller 2003), and artificial concentration of cervids through baiting and feeding (Fischer & Davidson 2005). Implementing and enforcing carcass import regulations, reducing artificial concentration of wild cervids by prohibiting baiting and feeding, and avoiding translocation of wild cervids are therefore management options that may reduce the risk of CWD transmission.

The Western Association of Fish and Wildlife Agencies (WAFWA) published Recommendations for adaptive management of Chronic Wasting Disease in the West (WAFWA 2017), which outlines possible CWD management strategies and recommendations for how to evaluate their effectiveness. Some of these recommendations have been incorporated in this plan.

Human health risks associated with CWD:

To date there has been no direct evidence that CWD is transmissible to humans (CDC 2018). A study investigated the occurrence of prion associated diseases over time in a CWD infected area of Colorado and did not find evidence of a higher incidence of prion associated diseases in residents (MaWhinney *et al.* 2006). Further, transgenic mice with human prion proteins, failed to develop the disease when exposed to elk CWD prions (Kong *et al.* 2005). Recently, a Canadian study successfully infected cynomolgus macaques by intracranial and oral routes (Czub 2017), however, a study by Race et al. 2018 reported no infection of the same species 11-13 years after experimental inoculation with CWD prions.
The UDWR maintains a website with information on CWD in the state and beyond and provides general advice on how to reduce the risk of exposure. Hunters are advised not to harvest animals that appear sick

or eat meat from suspect or positive animals. The following simple precautions are recommended when handling the carcass of any deer, elk, or moose:

- Do not handle or consume wild game animals that appear sick. Instead, contact your local DWR office and notify them of the location of the sick animal.
- Do not consume meat from animals known to be infected with CWD.
- Wear rubber or latex gloves when field dressing big game.
- On all deer, bone out the meat, and avoid consuming the brain, spinal cord, eyes, spleen and lymph nodes of harvested animals.
- Minimize handling of soft tissues and fluids. Wash hands with soap and warm water after handling any parts of the carcass.
- Knives, saws, and cutting table surfaces should be disinfected using a solution of 50 percent household bleach for at least an hour.
- Please contact the Utah Division of Wildlife Resources for additional information or if you see a sick animal while hunting.

Objectives of the plan:

1. Reduce the rate of spread of Chronic Wasting Disease in Utah and reduce the CWD prevalence in infected areas
2. Provide guidelines for response to detection of new infection foci
3. Communicate with the public and participate in scientific research

Objective 1) Reduce the rate of spread and prevalence of CWD:

This objective will be reached through the following strategies a) surveillance, b) harvest management, c) reducing risk of importing infected carcasses from other states by carcass import restrictions, d) restricting baiting and feeding of wildlife, e) limiting the translocation of wild cervids, f) prohibiting the rehabilitation of wild cervids, g) implementing clear requirements for disease testing of domestic cervids that are overseen by UDWR, and h) providing guidelines for proper carcass disposal.

Strategies to achieve objective 1:

a) Surveillance:

The UDWR has conducted CWD surveillance since 2002. To date, the surveillance has consisted of sampling hunter harvested animals in all wildlife management units across the state on a rotational schedule, sampling vehicle killed and other animals in areas with urban deer translocation programs, sample and test any symptomatic cervid, and test all cervids submitted for post mortem examination to the diagnostic laboratory for any reason. In addition, elk have been sampled opportunistically in areas where CWD has been confirmed. The sample efforts are designed to be able to detect ≥1% prevalence of CWD with 95% confidence and employs a weighted surveillance strategy (Walsh 2012). In this system, animals that are more likely to be infected (e.g. a symptomatic animal, vehicle killed animals, or adult bucks), are given a higher weight than animals considered at lower risk for being infected with CWD, (e.g. fawns or yearlings). An overview of the weights allocated to each sample type is shown in Table 2.

Table 2: Relative sample weights (points) associated with demographic groups of deer and elk for weighted surveillance of Chronic Wasting Disease. The weights were developed based on mule deer data from Colorado (Walsh 2012).

	Weight and species	
Demographic group	**Mule deer**	**Elk**
Symptomatic female	13.6	18.75
Symptomatic male	11.5	8.57
Road-killed male/female, all ages except fawns/calves	1.9	0.41
Other mortalities (predation, other unexplained in adults and yearlings)	1.9	0.41
Harvest, adult males	1	1.16
Harvest, adult females	0.56	1.00
Harvest, yearling males	0.19	N/A
Harvest, yearling females	0.33	0.23
Harvest, fawns/calves	0.001	N/A

The required sample size for determining a ≥1% prevalence of CWD with 95% confidence is 304 deer and 346 elk (due to lower test sensitivity in elk), using standard equations for determining freedom of disease (Dohoo 2010). Currently, the positive WMU's are sampled annually, whereas the WMU's considered free of CWD are sampled every 5 years on average in clusters of 2-3 units together. Table 3 is showing the sampling units that have been combined since 2006.

Hunter harvested samples are collected at check stations, meat processors, regional offices, and taxidermists. From each animal, the retropharyngeal lymph nodes will be collected. The obex may also be sampled if lymph nodes are not available. Samples will be screened for CWD with an Enzyme-Linked-Immunosorbent Assay (ELISA), and positives confirmed with Immunohistochemistry (IHC) at a National Animal Health Laboratory Network-accredited laboratory (Utah Veterinary Diagnostic Laboratory). Hunters who wish to have their animals tested from areas outside of the test zones can continue to do so at their own expense.

Test results are made available online for hunters to check. If an animal is positive, the hunter is contacted and, if the hunter agrees, the meat and antlers confiscated and incinerated. If the meat and antlers are surrendered, the hunter is issued a new tag for the following year in the same hunting unit.

Table 3: Wildlife management unit clusters sampled for CWD since 2006 in Utah.

Year	**Wildlife Management Units sampled (mainly hunter harvest)**								**Urban**
2006-07	2,3,4	5,6,7	10,11	17	21,23,25	8,9	16	13,14	*
2007-08	2,3,4	6-7	*	17	21,23,25	8,9	16	13,14	*
2008-09	2,3,4	5,6,7	*	17	23,24,25	8,9	16	13,14	*
2009-10	2,3,4	*	*	*	21,22	8,9	16	13,14	*
2010-11	2,3,4	*	*	*	27,28,29,30	8,9	16	13,14	*
2011-12	*	*	10,11	*	*	8,9	16	13,14	*
2012-13	*	*	*	*	*	8,9	16	13,14	*
2013-14	2,3,4	*	*	*	*	8,9	16	13,14	*
2014-15	*	5,6,7	*	17	*	8,9	16	13,14	*

2015-16	2,3,4	*	*	17	*	8,9	16	13,14	*
2016-17	2,3,4	*	*	*	23,24,25	8,9	16	13,14	*
2017-18	2,3,4	*	10,11	*	*	8,9	16	13,14	5, 17,18,19
2018-19	*	5,6,7	10,11	17	21,22	8,9	16	13,14	5, 17,18,19

Ongoing strategy for hunter harvest surveillance:

Rotational hunter harvest surveillance:

The rotational hunter harvest surveillance will continue by targeting a cluster of 2-3 units at least every 5 years using the weighted surveillance approach. Known positive units will also be included in the rotational surveillance instead of being sampled every year. A suggested 5- year rotational schedule is outlined in Table 4.

Compulsory testing and other strategies to increase sample size:

In Utah, it has become increasingly difficult to obtain adequate sample sizes to achieve statistically meaningful results. Beginning in the fall of 2020, compulsory testing may be introduced in units that are being surveyed in a given year. Compulsory testing could entail sampling a subset or all of harvested deer in a given unit and year. Additional strategies to increase the number of CWD samples may include sending letters to hunters to request their participation in the CWD surveillance program, providing freezers in convenient locations where hunters can leave the head of their harvested animal, hiring additional staff during the hunting season, and working with meat processors and taxidermist to obtain samples.

Table 4: Possible 5-year rotational schedule for sampling of hunter harvested mule deer across Utah.

Year	**Units**		
Year 1	1	23,24,25	12,15,16
Year 2	2,3,4	17	13,14
Year 3	5,6,7	10,11	8,9
Year 4	18,19	20,21,22	21,23,24
Year 5	22,24,28	27,28,29,30	-
Year 6	Rotation begins from the top		

b) Harvest management:

Hunting is an important tool to manage cervid populations in Utah and continues to be the most effective source of surveillance samples. Harvest management may also be the most effective tool to reduce spread and reduce or maintain low CWD prevalences. Research has also shown that that it may be most effective when focused on antlered deer (Jennelle *et al.* 2014; Potapov *et al.* 2016). To date, most of the CWD positive units in Utah have been managed at low buck to doe ratios, which may have contributed to the relatively low prevalence of CWD in Utah thus far. However, despite these efforts, the prevalence appears to be slowly rising, and as the disease spreads, changes to existing harvest management will likely be necessary in order to prevent further spread of disease in the state.

Bucks over 4 years of age are more likely to be infected with CWD (Miller & Conner 2005), and targeting older age bucks may therefore be a tool for reducing CWD prevalences (WAFWA, 2017). Hunts later in the hunting season and during and after the rut appear to be effective in increasing harvest of older aged bucks infected with CWD (Conner et al., 2000).

Further, CWD does not occur randomly distributed over the landscape, but CWD positive animals are often harvested from within smaller focal areas. This is known because hunters that harvest CWD positive animals are requested to provide an approximate GPS location of harvest. An increase in sample size of animals tested for CWD, e.g. through compulsory testing, may facilitate more effective identification of disease hotspots. More accurately locating disease hotspots could enable managers to increase harvest within those focal areas with the goal of removing more CWD positive animals.

Strategies to use harvest management as a tool to reduce the spread of CWD:

Data from Colorado suggests that after initial introduction of CWD into an area, CWD prevalence slowly increases but remains < 5 % for years. However, when an ~5% infection rate is reached, the increase in CWD prevalence becomes exponential and population impacts become detectable (Colorado Parks and Wildlife, 2018). In Colorado, a 5% prevalence is also the threshold for mandatory management action to reduce the prevalence of CWD (Colorado Parks and Wildlife, 2018). In Utah, a 5% prevalence of infection likely has been reached in Unit 13 (La Sal Mountains), whereas in other units, the prevalence is likely still below 2%, but also with an increasing trend. Because Utah still has a relatively low prevalence of CWD, setting the threshold for action at 5% would result in years of inaction while waiting for the prevalence to become higher. The consequence would not only be more disease in the populations, but also spread of CWD from its current infection foci to other areas. Potentially, valuable limited entry units bordering CWD positive areas could be infected if the prevalence is not kept at the lowest level possible.

Consequently, in order to reduce the risk of an increase in prevalence and spread of CWD, the threshold for implementation of CWD management actions in Utah should be set at detection of CWD. Currently, the CWD surveillance program is aimed at detecting a ?1% prevalence of CWD with 95% confidence. Based on this surveillance program, the threshold for taking action should therefore be set at the detection of the first CWD positive, which, if sample sizes are met, likely would mean that the CWD prevalence is ?1%. The type of action taken in a unit should be decided by the regional biologist, in consultation with the big game and wildlife health programs.

One or more of the following harvest management strategies can be implemented in units with ε1% prevalence of CWD:

- The buck to doe ratio of each unit is outlined in the unit management plans. If CWD is present in a unit, the buck to doe ratio should be kept at the lowest end of the range outlined in the plan. A ratio of 15-17 bucks per 100 does should be maintained in units that are already CWD positive. If CWD is found on a unit that is managed for 18-20 bucks per 100 does or higher, consider changing the management of the unit to 15-17 bucks per 100 does.
- Late season buck hunts can be implemented within focal hotspot areas within CWD positive units. The goal of such hunts is to target prime age class bucks that are more likely to be infected with CWD. The boundaries of such areas will be determined by the regional biologists and managers and be based on previous CWD surveillance, deer movement data, and location of winter ranges. These boundaries may be changed if CWD spread from the original infection foci.
- If CWD is detected in units with higher buck to doe ratios, a late season hunt can be implemented immediately to target prime age class bucks. The area in which the late season hunt is

implemented should be determined by the area biologist and wildlife managers based on knowledge of deer movements and location of winter ranges. In addition, change in hunt management to lower the buck to doe ratio across the unit should be considered.
- Issuance of more buck and doe hunting licenses to lower the population density.
- Shifting of the harvest to later in the season during and after the rut to target prime age class bucks that are more likely to be infected with CWD while maintaining the overall same number of tags.
- Adding a unit wide hunt later in the season during or after the rut to target prime age class bucks and increase overall harvest.
- Increasing harvest on private land and in urban areas by increasing collaboration with private land owners, wildlife management areas, cities, counties and other entities.

In order to reduce focal disease hot spots, managers could consider the following management options in addition to the late season hunt:
- Increase the overall number of tags within a focal hotspot area.
- Add doe hunts within focal hot spot areas.

The effectiveness of new management strategies should be evaluated over a period of at least 10-15 years (2-3 sampling rotations). Additionally, any implementation of targeted strategies (e.g. late season buck hunts within focal hotspot areas) should involve additional annual CWD monitoring to determine the prevalence of CWD within the focal area and longer term effectiveness of the strategy. As new science becomes available additional CWD management strategies may be added to this plan.

c) Carcass import restrictions:

The import of deer, elk and moose carcasses from known infection areas is prohibited. Only meat that is cut and wrapped either commercially or privately, quarters or other portion of meat with no part of the spinal column or head attached, meat that is boned out, hides with no heads attached, skulls or skull plates with antlers attached that have been cleaned of all brain matter and spinal column tissue, antlers with no meat or tissue attached, upper canine teeth known as buglers, whistlers or ivories, and finished taxidermy heads are allowed. The Division keeps a list of states, provinces, game management units, equivalent wildlife management units, or counties on their website, from which it is prohibited to import carcasses, except for the parts listed above. Prohibiting import from infected units or counties instead of from entire states that have CWD, significantly increases the risk of bringing in an infected carcass as finding CWD is very dependent on the quality of the surveillance.

Strategy to reduce risk of importing CWD infected carcasses through import restrictions:

It will be prohibited to import carcasses, except for the carcass parts listed below from any state where CWD has been detected. Additional states may be added as necessary.

Permitted parts: Only the following parts of wild deer, elk and moose may be imported from states with confirmed CWD:
- Meat that is cut and wrapped either commercially or privately
- Quarters or other portion of meat with no part of the spinal column or head attached
- Meat that is boned out
- Hides with no heads attached

- Skulls and skull plates with antlers attached that have been cleaned of all brain matter and spinal column matter
- Antlers with no meat or tissue attached
- Upper canine teeth known as buglers, whistlers or ivories
- Finished taxidermy heads

d) Baiting and feeding:

Baiting and feeding of wildlife in Utah is currently legal and unregulated. However, with the exception of the elk feeding ground at Hardware Ranch in northern Utah, state managed feeding of wildlife only occurs on a very limited basis during extreme winter conditions. Baiting and feeding by private individuals may occur but the extent is unknown.

Strategy to reduce the risk of CWD transmission through artificial concentration of cervids:

Artificial concentration of wild cervids can facilitate transmission of CWD and should be avoided. Even during emergency conditions such as extreme winters, UDWR will not feed cervids in areas where CWD has been detected, or in high risk areas where CWD is suspected. All intentional feeding of wild cervids by private individuals should be limited to the largest extent possible. The UDWR will educate the public about the disease risks associated with feeding of wildlife.

e) Translocation of cervids:

Import and translocation of cervids significantly increases the risk of spreading CWD, and has been the single most important factor in spreading CWD in North America (Miller & Fischer 2016).

Strategies to reduce risk of spread of CWD through translocation of cervids:

The UDWR should not allow for import of free-ranging or captive deer (*Odocoileus* sp.), free-ranging elk (*Cervus elaphus* sp.), or free-ranging or captive moose (*Alces alces*) into Utah. The UDWR has previously translocated free-ranging cervids within the state from areas considered free of CWD. Such translocations carry significant risk of spreading undetected infections and should be limited to the largest extent possible. Translocation of moose away from urban areas is permitted within the same unit.

f) Rehabilitation:

Rehabilitation can lead to an unnatural mixing and concentration of wild cervids with unknown background and infection status, and it increases the risk of moving cervids from one area of the state to the other. Further, rehabilitated deer don't always acclimate well to natural conditions when released back into the wild, and these animals often congregate in urban areas resulting in nuisance and public safety concerns.

Strategy to reduce risk of spreading CWD through wildlife rehabilitation:

The Utah DWR prohibits the rehabilitation of deer, moose, or elk of any age in order to prevent the mixing of potentially infected and non-infected animals.

g) Alternative livestock species:

Domesticated elk:

Captive elk ranching is overseen by the UDAF. The Division will continue to collaborate with UDAF on captive elk ranching, prevention of ingress and egress of wild cervids, and finding sustainable solutions to reduce the risk of CWD transmission between captive and wild cervids. If wild deer are found in captive elk facilities, owners may apply for certificate of registration (COR) to lethally remove wild deer, in accordance with R657-71.

Fallow deer and reindeer:

Keeping of fallow deer and reindeer in Utah requires the possession of a valid COR issued by the UDWR. Facilities must meet the standards for keeping fallow deer and reindeer as outlined in the COR, and no permit can be issued before a facility inspection has been conducted and the facility approved. Each fallow deer and reindeer must be identified with a unique identification, and a full herd inventory comprising of ID number, age, sex, disposition, place of origin, place to where the animal was sold (if sold) must be submitted annually. Any animal that dies for any reason must be tested for chronic wasting disease (retropharyngeal lymph nodes and/or obex) at a National Animal Health Laboratory Network (NAHLN) approved laboratory (such as the Utah Veterinary Diagnostic Laboratory) and the test results reported to the UDWR with the annual report. The Division has the right to conduct unannounced inspections at any time to determine whether the reported inventory is correct. Failure to comply with these regulations will lead to revocation of the COR.

h) Carcass disposal:

Disposal of infected carcasses is a concern for environmental contamination, and potentially could be a source of spread of CWD.

Strategy to avoid CWD spread through carcass disposal:

Incineration, alkaline hydrolysis tissue digestion, and burial in an approved, active landfill are considered suitable methods for carcass disposal (AFWA 2018). The DWR will continue to educate hunters, the public, meat processors, and taxidermists about the risk of CWD, and appropriate carcass disposal methods. Hunters and meat processors are encouraged to help prevent the spread of CWD by following management practices such as a) processing the carcass in the field and thereby not move it out of the area of origin, b) disposing carcasses by burial in a landfill, or c) disposing unused animal parts and wild game meat in double bagged plastic bags in the household trash for burial at the landfill.

Objective 2) Provide guidelines for response to detection of new infection foci

Strategy: Implement population reduction and sampling to determine prevalence

Aggressive sampling in focal areas was conducted early in the CWD epidemic in Utah but has not been used as a tool since then. If CWD is detected in new areas, strategies as outlined under objective 1 should be implemented, but in addition, an immediate response should also be considered on a case by case basis. A more aggressive approach should especially be considered especially in areas where CWD has previously not been detected, and that are located far from previous infection foci.

Factors that may determine the strength of a response:

- Distance to CWD positive areas
- Resident or migratory population
- Connectivity or isolation to other populations
- Size of the population
- Current hunt management of the population
- Presence of other cervid species
- Presence of domestic cervid facilities (elk, reindeer, fallow deer)
- Accessibility (private and public land)
- Hunting opportunity for the public
- Public perception of the proposed change or intervention
- Location with respect to another positive area out of the State of Utah or tribal ground

If CWD is detected within a new area, a feasible course of action should be determined by area biologist and wildlife managers based on factors listed above.

Strategies to consider may include:

- Immediate, localized reduction of population densities.
- Immediate, intensive sampling in areas around the positive animal in order to determine CWD prevalences.
- Immediate implementation of a late season hunt targeting older age class bucks.

Objective 3) Communicate with the public and participate in scientific research.

This objective will be reached through the following strategies: a) Communication with the public, and b) participation in relevant, applied research.

a) Communication with the public:

The UDWR is committed to providing the public with factual, timely and accurate information on the CWD prevalence, distribution, and management in the State. The Division will maintain an up to date website and release relevant information through other media outlets when necessary. The information provided will include where CWD has been found in the State, public health risks as determined by public health professionals, efforts to monitor the disease, links to laws and regulations pertaining to CWD, information on carcass import restrictions, and how the public can help minimize the spread of CWD. The UDWR will engage hunters in education about the disease transmission risks associated with baiting and feeding wildlife, using urine scents and lures, and harvest management to manage CWD prevalences in order to gain public support for any regulations and management actions that may be necessary. The location of hunter check stations, regional offices, and annual units for CWD surveillance will also be publicized on the CWD website and prior to the hunting season on social and other DWR media outlets.

b) Participation in relevant, applied research:

The Division will participate in applied research that is relevant for enhancing knowledge about CWD. Participation in relevant research project will be decided and approved by UDWR on a case by case basis.

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