

CPW LOGO

Colorado Chronic Wasting Disease Response Plan

DEER PICTURE

ELK PICTURE

MOOSE PICTURE

Colorado Parks and Wildlife
Terrestrial Section
2018

MISSION/Responsibility OF CPW (Set the tone of document for having the responsibility of conserving and managing Colorado's wildlife resources for perpetual the enjoyment of all)

NOTE FROM THE DIRECTOR or COMMISSION

CWD Management Objective: To maximize control of CWD prevalence while minimizing the impact on Colorado's deer, elk and moose herds.

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V. Surveillance & Monitoring

Current Status: CWD Prevalence Rates by DAU - 2017 To Be Completed After CWDAG Meeting 3

Selection of DAUs for Mandatory Testing of Hunter-Harvested Deer

CPW will include deer herds in mandatory testing when they have shown signs of CWD prevalence for several years or herds that are suspected to have high prevalence and are lacking a reliable baseline prevalence estimate. Baseline prevalence estimates are important for understanding the rate of change in prevalence over time. Herds known to have high prevalence will be the highest priority for mandatory testing. CPW will maximize the number of herds tested statewide with finite resources available; both mule deer and white-tailed deer will be tested for CWD. The limited resources available to operate mandatory testing will only allow 6-8 herds to be tested each year.

Not all herds will be included in mandatory testing over time. If detections of CWD have been low or zero in a herd, that herd will not be prioritized for mandatory testing. Instead, other surveillance efforts more appropriate for detecting CWD will be used, including opportunistic testing of live or dead animals suspected to have CWD based on physical appearance or behavior. Free-ranging deer, elk and moose that are suspected to have CWD will be dispatched by CPW personnel and tested for disease. CWD infected cervids are more likely to be killed by vehicles than non-infected animals; therefore, CPW will consider how best to sample roadkill for detecting CWD. When detections suggest prevalence is at a level of concern and increasing, that herd may be prioritized for mandatory testing.

15-Year Monitoring Plan

The 15-year monitoring plan using mandatory testing is presented in Table 2. In 2018, six deer herds will be included in mandatory testing that differ from those tested in 2017. The same approach will be used in 2019, 2020 and 2021. From 2022-2026, mandatory testing will include herds that were previously included in mandatory testing and that are implementing some form of CWD management response, plus addition herds that have not already been included in mandatory testing. This creates a five-year rotational approach that allows CPW to test a large number of herds statewide with the resources available. In 2027-2031, herds included in mandatory testing during the first and second five-year rotations will again be retested. This rotational approach also allows adequate time to show a meaningful change in CWD prevalence over time while ensuring that upwards of 40 different herds are included in mandatory testing. Reassessment of this 15-year rotational approach will occur throughout the testing period. If at some point elk or moose are included in mandatory testing, the rotational schedule for deer will change.

Conducting mandatory testing in a single herd for consecutive years or every other year likely would not detect a meaningful change in prevalence. CWD is a relatively slow moving disease and annual changes in prevalence would probably fall within the 95% confidence intervals of prevalence estimates generated from large sample sizes. For example, in 2017 CPW tested 931 adult bucks in a single herd for CWD and the 95% confidence interval generated for the

prevalence estimate (15.3%, CL 13.3-17.7) was $\pm 2\%$ prevalence (Table 1). However, sample sizes for the five other herds included in mandatory testing were about one-third of this sample size and had wider confidence intervals ($\sim \pm 4\%$ prevalence). CPW is targeting sample sizes of 300 adult buck submissions through mandatory testing and therefore expects 95% confidence intervals on prevalence estimates to be $\pm 2-4\%$. Since annual changes to prevalence are expected to be less than 2%, it may take multiple years to detect any change in prevalence. A 5-year rotational approach should be enough time to test how CWD prevalence responds to prescribed management actions.

Nonetheless, CPW may incentivize voluntary submissions from select herds to yield large sample sizes. Providing an incentive, such as a free CWD test to hunters, may effectively increase the number of samples submitted without requiring mandatory testing. While voluntary submissions may not yield as large of sample sizes as mandatory testing, they may be large enough to generate trustworthy prevalence estimates. CPW has provided incentives in previous years, though efforts have been limited and, in most cases, responses have not yielded a sufficient number of samples to reach targets. Additional factors that must be considered before incentives are offered include the cost of the incentive within a finite budget, personnel available to handle increased volumes of submissions, and whether a cap is created once the targeted sample size is reached.

Cost Projections for 15-Year Monitoring Plan

To Be Completed After CWDAG Meeting 3

TABLE 2: Tentative fifteen-year schedule for mandatory and incentivized CWD testing of deer, including a five-year rotation for testing select herds already included in mandatory testing. Annual costs for mandatory testing would be approximately the same. The five-year rotation will allow an evaluation of how CWD prevalence responds to prescribed management actions.

Year	Deer DAUs (Herds) Included in Mandatory Testing	Incentivized Voluntary Testing
2017	D-04, D-07, D-10, D-19, D-40, D-42	None
2018	D-02, D-05, D-08, D-09, D-12, D-44	D-07
2019	6-8 DAUs not included in 2017-2018	D-02
2020	6-8 DAUs not included in 2017-2019	TBD
2021	6-8 DAUs not included in 2017-2020	TBD
2022	Select DAUs from 2017 Mandatory Testing; New DAUs	TBD
2023	Select DAUs from 2018 Mandatory Testing; New DAUs	TBD
2024	Select DAUs from 2019 Mandatory Testing; New DAUs	TBD
2025	Select DAUs from 2020 Mandatory Testing; New DAUs	TBD
2026	Select DAUs from 2021 Mandatory Testing; New DAUs	TBD
2027	Select DAUs from 2017/2022 Mandatory Testing	TBD
2028	Select DAUs from 2018/2023 Mandatory Testing	TBD
2029	Select DAUs from 2019/2024 Mandatory Testing	TBD
2030	Select DAUs from 2020/2025 Mandatory Testing	TBD
2031	Select DAUs from 2021/2026 Mandatory Testing	TBD

VI. CWD Prevalence Threshold for Compulsory Disease Management

Deciding when to implement management actions to reduce CWD prevalence in a herd is a serious consideration as actions may change the structure of age classes, sex ratio, and population number and density. One approach is to set a prevalence threshold for compulsory intervention at or before the point when mortality from CWD causes an undesirable effect in the herd. If prevalence approaches or exceeds an established threshold put in place to safeguard a herd, adaptive management actions would be taken to ensure a reduction in prevalence over time. Once the herd's prevalence has been reduced to a low level, less aggressive management actions would be needed to prevent CWD prevalence from increasing.

An appropriate threshold for compulsory intervention could be determined from the level of adult female mortality caused by CWD that would initiate a declining population trend. Population models can be used to predict when a declining trend would occur by entering various adult female survival rates into multiple runs of the same population model with other vital rates being held constant. The difference between the model-derived survival rate for when a population enters a declining trend and the observed adult female survival rate generated from fieldwork represents the maximum annual additive adult female mortality that could be realized before the onset of a population decline (Figure X). This mathematical difference would be an appropriate maximum threshold for compulsory intervention to ensure a stable population. This approach to determine a threshold for CWD management is only valid when the population is increasing.

FIGURE X. ADD GRAPH TO ILLUSTRATE THE ABOVE PARAGRAPH

In the case of a stable population, any increase in adult female mortality would cause a population decline unless other vital rates, such as survival of young, increase. Therefore, if vital rates of a stable population stay the same, an increase in CWD prevalence would initiate a population decline. Likewise, in the case of a declining population, any increase in CWD prevalence would accelerate a population decline. An appropriate CWD management objective for stable or decreasing population would be to minimize CWD prevalence to minimize the affect the disease has on the herd. An appropriate prevalence threshold for compulsory intervention could be set according to the lowest level of CWD prevalence that managers can realistically maintain and is socially acceptable.

CWD Prevalence Threshold for Deer

CPW intensively monitors annual adult female survival and winter fawn survival in five mule deer herds known as Intensive Mule Deer Monitoring Areas. Adult male survival is also monitored in two of the five herds. These herds were selected to ecologically and geographically represent mule deer west of I-25. Survival rates from these herds are used to produce a statewide average survival rate and are used in deer population models.

Colorado's statewide mule deer population has been in a long-term decline. The current statewide average adult female (>2 years) survival rate is approximately 83% and the average adult female survival rate that would cause a statewide decline generated from CPW's population models is approximately 83% (Appendix I). Therefore, all additional adult female mortality will accelerate the declining trend, which means any increase in CWD prevalence will adversely affect the population. Since eradication of CWD is unrealistic, Colorado must accept some level of additive adult female mortality caused by CWD that will contribute to the population decline until statewide average vital rates improve.

The threshold for compulsory intervention that was determined appropriate for deer was not calculated from modeled and observed estimates of adult female survival, but the lowest value of CWD prevalence that CPW believes is possible to manage to minimize adult female mortality. This threshold is 5% prevalence for adult male deer at the scale of individual herds (DAUs).

For several reasons explained in the Introduction section of this plan, Colorado is predominantly focusing CWD monitoring efforts on male deer. Mandatory CWD testing of hunter harvested male deer is the most effective way to generate a large sample size and small statistical confidence interval for CWD prevalence in each Colorado deer herd. Large sample sizes, thus statistical confidence in prevalence estimates, are not possible for hunter-harvested female deer because few antlerless deer licenses are issued for many herds throughout the state. This justifies using a prevalence threshold for males instead of females.

Considering that CWD monitoring in Colorado has shown that adult female deer typically exhibit CWD infection at half the rate of adult males (>2 years), the 5% adult male prevalence threshold for compulsory intervention is approximately a 2.5% threshold in adult female deer. Recalling that CWD is 100% fatal and animals die from the disease within 2.5 years of infection, roughly half of the infected deer will die each year. Therefore, if a herd has a 5% prevalence threshold for adult males, approximately 2.5% of adult females are infected and 1.25% of adult females will die from CWD each year. This threshold represents the lowest rate of adult male prevalence that is realistic to manage statewide, and the level of adult female mortality that must be tolerated despite the fact that current statewide average vital rates for deer are causing a population decline.

A 5% prevalence threshold is also justified when comparing observed Colorado prevalence data to modeled disease trends showing how CWD infection rate increases over time. Actual CWD monitoring data from Colorado were used to create a composite epidemic curve and compared to a modeled epidemic curve to learn whether actual changes in prevalence for mule deer followed the model (Figure Y). The modeled curve does reflect a similar trend in prevalence observed in the White River herd (D-07) from 2002-2017 where prevalence increased from 1.3% to 15.3%. Other Colorado deer herds also show similar fifteen-year trends to the modeled curve. From a management perspective, maintaining prevalence below the inflection point would prevent a rapid increase in the rate of infection. According to both the modeled curve and the composite field data from Colorado, the inflection point is approximately 5%. (Miller et al. 2000; Ricci et al. 2018)

Composite epidemic curve (field data vs. model)

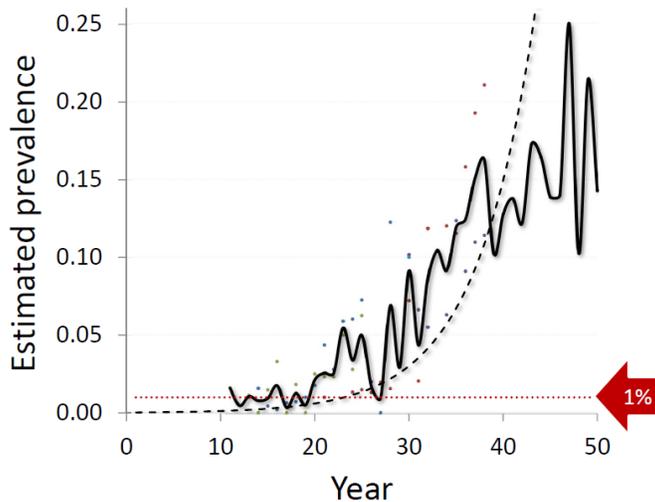


FIGURE Y.

Above and Below the 5% Prevalence Threshold

Establishment of a 5% prevalence threshold for compulsory intervention creates two management scenarios:

1. If the CWD prevalence estimate for adult male deer in a herd is greater than or equal to 5%, management actions will be taken to reduce prevalence until it falls below the 5% threshold.
2. If the CWD prevalence estimate for adult male deer in a herd is less than 5%, management actions are recommended to maintain prevalence below the 5% threshold.

How prevalence is reduced, and specifically what management actions are prescribed, will be at the discretion of CPW managers overseeing each herd. The Management Actions section of this response plan reviews the various management approaches CPW may take to reduce prevalence below the 5% threshold. Also, the rate at which prevalence is decreased will be decided at the local level by CPW managers, not as part of this statewide CWD response plan. For herds that have adult buck prevalence rates that exceed 10%, it may take 5-10 years of management action to bring prevalence down below 5%. CPW will make every effort to reduce prevalence to below the threshold within a ten year period. If, after a long period of adaptive management, the 5% adult male prevalence threshold proves to be unrealistically low, CPW will set a more realistic statewide threshold.

ELK and Moose

Thus far, CWD infection rates in Colorado elk and moose herds appear to be lower than rates in deer. A review of Colorado prevalence rates shows that prevalence is usually much lower in elk than

deer within the same geographic area. The elk herd with the highest CWD prevalence in the state overlaps the highest prevalence deer herd, but prevalence is at least three times higher in deer than elk in this same area. Because the areas of infected elk herds are similar or even the same as for deer, management efforts to reduce prevalence in deer herds are anticipated to also reduce CWD infection in elk, at least in the short term.

Moose appear to be even less likely to contract CWD than deer or elk. Only two cases were detected in only one moose herd from 2015-2017. Although harvest rates are considerably lower for moose than for deer and elk, thus lower hunter-harvest submissions for CWD testing, CPW does not attribute low prevalence estimates in moose to low sample sizes. CPW anticipates that management efforts to reduce prevalence in deer herds will also reduce CWD infection in moose.

A threshold for compulsory intervention has not been determined for elk or moose at this time. CPW will focus CWD management efforts on deer and concurrently monitor prevalence trends for all three species. Should the prevalence rates for elk or moose sharply increase, CPW will consider setting an appropriate statewide CWD prevalence threshold for each species.

Herd Management Plans

Colorado's deer, elk and moose herds each have varying habitat characteristics, resource limitations, stresses on productivity, harvest strategies, land ownership, human population influences, and history of stochastic events that make each herd unique. CPW's approach to big game management is by design customized to the herd level and implemented through the use of herd management plans.

Herd Management Plans (HMP) are a key element of CPW ungulate management programs. Through an open public process, HMPs establish local herd management objectives using the best scientific population information in the context of habitat availability and social carrying capacity. HMP objectives provide the basis for development of annual regulations and license setting as well as a reference point for the public, other agencies, and the Parks and Wildlife Commission to measure progress toward achieving management objectives. The components of typical HMPs are population objective ranges and post-hunt sex ratio objective ranges. Population objective ranges are important for managing herds to both biological and social capacity. Likewise, sex ratio objectives are a significant social and biological aspect of herd management planning.

HMPs are central to CWD management. The population and sex-ratio objective ranges will be used to implement management prescriptions and herd managers will incorporate CWD management objectives into HMPs. If a herd is scheduled for mandatory testing, revisions of that herd's HMP will be scheduled, ideally, immediately following mandatory testing. HMPs are intended to be 10-year plans, which means each HMP would be revised once or twice within the 15-year Surveillance Plan.

WAFWA Recommendations for Adaptive Management of Chronic Wasting Disease in the West

In 2017, the Western Association of Fish and Wildlife Agencies (WAFWA) published recommendations to facilitate the assessment of three CWD suppression strategies using an adaptive management framework in western states. The three main strategies identified for evaluation include: 1) the reduction of artificial points of host concentration, 2) harvest management, and 3) harvest targeting disease foci. Furthermore, WAFWA recommends using a Before-After-Control-Impact (BACI) design to determine what treatments most effectively influence CWD prevalence. CPW is already well-suited to use a BACI design with annual estimation of CWD prevalence for designated herds, a thorough understanding of similarities between herds, and a long list of management actions that can be used as treatments for “matching pairs” of herds. The list of possible management actions discussed in this CWD Response Plan incorporate the suppression strategies identified by WAFWA.

The statewide guidance included in this CWD Response Plan intends to provide herd managers with maximum flexibility to customize management actions that will reduce or maintain CWD prevalence below the 5% prevalence threshold. The management actions included in this section will all be considered by herd managers when determining how to respond to CWD prevalence estimates that are above or below the threshold.

VII. Management Actions and Recommendations to Control CWD Prevalence

a. Reduce Population or Density

If the 5% prevalence threshold for adult males is met or exceeded in a herd, the CWD management response may be to reduce population or the density of animals in specific areas. If this management action is selected, herd managers will strive to reduce population to the lower end of the population objective range identified in the herd management plan. Since the population objective range has already been approved through a public process, a formal public process will not be conducted when managers implement a CWD management response. Hunter harvest will be the primary tool used to reach the bottom of the range.

The rate at which the herd is reduced will be determined by the herd managers, though managers should strive to reduce population to the lower end of the HMP population objective range and reduce prevalence to below the 5% threshold for adult bucks within ten years. When prevalence exceeds 10%, it is recommended that herds are aggressively reduced during the years between the first and second round of mandatory testing for that herd.

Treatments prescribed to reduce or maintain prevalence should go into effect the year following when mandatory testing was initiated. That same herd will be retested under mandatory testing within a 5-year window according to the 15-year Surveillance Plan. If changes to prevalence have not been realized, the intensity of the prescription will likely be increased. If population has reached the bottom of the objective range set in the HMP and CWD prevalence is still above the 5% threshold, CPW will consider revision of the HMP objectives.

The following list of tactics will be considered as possible treatments for reducing population or density:

- Increase female and/or either sex hunting licenses
- Increase harvest in later seasons or high prevalence areas
- Increase opportunities for harvest, such as increasing access, the availability of PLO licenses, hunting on open spaces, and new special hunts for youth, R3 and new hunter programs
- Increase harvest by creating a Special Hunting Season for Disease Management in Big Game
- Increase harvest through targeted population reductions not related to hunter harvest. In areas where hunters are not able to access herds, CPW will consider the use of focused herd reduction measures as a last resort.
- Increase hunter access of all types through specialized strategies or programs

b. Reduce Male/Female Ratio

If the 5% prevalence threshold for adult males is met or exceeded in a herd, the CWD management response may be to reduce the ratio of males to females. If this management action is selected, herd managers will strive to reduce male:female ratio to the lower end of the sex ratio objective range identified in the herd management plan. Since the sex ratio objective range has already been approved through a public process, a formal public process will not be conducted when managers implement a CWD management response. Hunter harvest will be the primary tool used to reach the bottom of the range.

This management action is expected to be common for deer because adult male deer typically have twice the infection rate as does. Reducing the segment of the herd with the highest prevalence should effectively reduce prevalence in the short term. Additionally, of all Colorado deer herds that have classification data, 70% (35 out of 50 herds) have a 3-year average of observed sex ratios that exceeds the top of the HMP sex ratio objective range.

The rate at which the sex ratio is reduced will be determined by the herd managers, though managers should strive to reduce the sex ratio to the lower end of the HMP sex ratio objective range and reduce prevalence to below the 5% threshold for adult bucks within ten years. When prevalence exceeds 10%, or if the sex ratio exceeds the range set in the HMP, it is recommended that the sex ratio is aggressively reduced during the years between the first and second round of mandatory testing for that herd.

Treatments prescribed to reduce or maintain prevalence should go into effect the year following mandatory testing. That same herd will be retested under mandatory testing within a 5-year window according to the 15-year Surveillance Plan. If changes to prevalence have not been realized, the intensity of the prescription will likely be increased. If the sex ratio has reached the bottom of the objective range set in the HMP and CWD prevalence is still above the 5% threshold, CPW will consider revision of the HMP objectives.

The following list of tactics will be considered as possible treatments for reducing the sex ratio:

- Increase male hunting licenses
- Increase male harvest in later seasons or in high prevalence areas
- Shift male harvest from early seasons to later seasons in high prevalence areas
- Adjust hunt codes to focus harvest in specific areas
- Eliminate float groups to better control hunter pressure across seasons
- Increase opportunities for male harvest, such as changing male licenses from List A to List B, increasing the availability of PLO licenses, hunting on open spaces, and creating new special hunts for youth, R3 and new hunter programs
- Increase male harvest by creating a Special Hunting Season for Disease Management in Big Game
- Long-term focused herd reduction measures

c. Change Age Structure

Colorado data has shown that at current prevalence rates, the age classes of deer most likely to be infected are 4-6 year old males. Without changing the population or sex ratio, managers could change a herd's age structure to reduce the number of 4-6 year-old males and increase the number of 1-3 year-old males. Managers would likely implement antler point restrictions to increase harvest of adult males. However, antler point restrictions create an additional regulation to enforce, they assume harvest of adult males will increase, and they may create a surge of younger males entering the mature age classes after a few years of implementation. If deer behavior changes and males become nocturnal, reduction in population or sex ratio may still be necessary.

MORE SUPPORTING TEXT/PARAGRAPHS?

- Antler point restriction
- Increase male hunting licenses
- Increase male harvest in later seasons or in high prevalence areas
- Shift male harvest from early seasons to later seasons in high prevalence areas
- Adjust hunt codes to focus harvest in specific areas
- Eliminate float groups to better control hunter pressure across seasons
- Increase opportunities for male harvest, such as changing male licenses from List A to List B, increasing the availability of PLO licenses, hunting on open spaces, and creating new special hunts for youth, R3 and new hunter programs
- Increase male harvest by creating a Special Hunting Season for Disease Management in Big Game
- Long-term focused herd reduction measures

d. Maximize Ability to Remove Diseased Animals at the Smallest Scales Possible (hot spots)

CWD positive animals are not uniformly distributed in a herd or over land area. Of great value to managers is an understanding of how CWD positive animals are distributed at the smallest scale possible. This is because the most effective way to reduce CWD prevalence is to expeditiously remove concentrations of infected animals.

CPW currently requires hunters to report the location of harvest and often obtains GPS locations. Harvest locations are matched with CWD test results to map all of the positive animals harvested and determine where hot spots occur. For herds that include large geographic areas, prevalence estimates may be heavily influenced by high prevalence found in a few hot spots. Targeted management actions would help achieve the CWD management objective of maximizing the impact on CWD while minimizing the impact on herds.

The larger the number of submissions for CWD testing, the easier it is to identify hot spots at smaller scales. In general, mandatory testing should generate large enough sample sizes to assess CWD prevalence at various scales including the herd (DAU), hunt code, and Game Management Unit (GMU) level. Management prescriptions made by local herd managers will be at the smallest scale possible provided sufficient surveillance data are available.

Hunter harvest will be the primary tool used within identified hot spots to remove infected deer. However, herd managers will consider a suite of management actions to maximize the effectiveness of removing infected animals.

Deer and elk that seek refuge within town limits, often at high concentrations, pose a serious management challenge. Hunting is often prohibited on city and county open spaces and deer and elk evade CPW's primary tool to manage populations, which is hunter harvest. Because deer and elk seeking refuge on open spaces are not included in hunter harvest, the CWD prevalence of these animals is not included in their herd's (DAU) prevalence estimate. CPW will need to work with municipalities to cooperatively address disease issues in deer and elk with herd health being a common goal. However, it is recognized that because of the challenges of managing deer on open spaces, reducing CWD prevalence down to 5%, or maintaining it below 5%, may be unrealistic for herd managers dealing with challenges created by open space.

Recommendations:

- CPW will enhance cooperation with municipalities to explore how best to manage CWD in deer and elk seeking refuge on open spaces. CPW will coordinate the involvement of multiple stakeholders to present CWD issues to municipalities and the need for new big game management programs.
- CPW will consider implementing focused surveillance efforts in closed populations within urban areas to inform the need to conduct focused population reductions.

e. Remove Motivations that Cause Animals to Congregate

The identification and removal of point-sources that cause deer, elk and moose to congregate is the basis for this action. Per CPW regulations in W-0 Article XI #021 - Feeding or Attracting Wildlife, no person shall place, deposit, distribute or scatter grain, hay, minerals, salt, or other foods so as to intentionally constitute a lure, attraction or enticement for big game not lawfully held in captivity (Appendix II). Colorado Parks and Wildlife Commission policy further limits the conditions set on emergency winter feeding and baiting of big game ungulates (Appendix III). Remaining motivations that cause animals to congregate may include unintentional attractants, such as mineral blocks and harvested crops that are unsecured or spilled. Agricultural producers in areas of high CWD prevalence may be amenable to removing or burying crop spills and minimizing the use of mineral blocks.

Recommendations:

- CPW will work with producers, landowners, and agriculture authorities to minimize unintentional attractants.
- CPW will produce and release a targeted educational brochure for relevant groups (Colorado Cattlemen's Association, Colorado Livestock Association, Colorado Wool Growers Association, Colorado Farm Bureau, relevant roundtable meetings, etc.) to deliver guidance on eliminating point sources and minimizing the use of mineral blocks in high prevalence areas to producers.
- CPW will work with municipalities to reduce or eliminate feeding within the municipality.
- CPW will develop an education campaign about not feeding wildlife and the implications feeding has with spreading CWD.

f. Minimize Prion Point Sources

Transportation and disposal of carcass parts of CWD positive animals may create new point sources of CWD prions. For many years, CPW enforced regulations specific to the transportation of carcasses to minimize the movement of prions around the state. In 2008, the Colorado Parks and Wildlife Commission struck these regulations and replaced them with a Commission policy on CWD (Appendix IV). The new policy on CWD removed restrictions on carcass transportation and emphasized education efforts on the proper disposal of deer and elk carcasses as the primary strategy to minimize risks for spreading CWD via carcasses. CPW currently advises hunters that all parts of a CWD infected animal, including processed meat, should be carefully contained in two heavy duty plastic garbage bags and put out with the weekly trash or brought to the local landfill, and further recommends that each plastic garbage bag be independently tied. However, there still exist opportunities to educate various public interests of Colorado's deer, elk and moose resources to minimize risk of spreading CWD via carcasses.

Taxidermists and meat processors, for example, handle a large number of carcasses that may or may not be tested for CWD. Therefore, as a precaution to minimize the possibility of creating a prion point source, taxidermists and meat processors should dispose carcass parts

in such a way that does not leave carcasses exposed. CPW will consider outreach efforts that target taxidermists, meat processors, and other interests to minimize prion point sources.

Recommendations:

- CPW will develop and release an educational effort regarding carcass disposal targeted at taxidermists and meat processors.
- CPW will work to create carcass disposal sites at landfills in cooperation with state health organizations, Environmental Protection Agency, Colorado Department of Transportation, and landfill organizations.
- CPW will consider additional outreach efforts to inform hunters about minimizing the transportation of carcass parts that are most likely to contain CWD.

BELOW THIS POINT HAS NOT BEEN DRAFTED AND INCLUDES ONLY THE OUTLINE

g. CWD Prevalence Threshold Incorporation into Herd Management Plans

- Per Colorado Parks and Wildlife Commission policy (revised 2015), “management actions to address CWD should be included in appropriate Data Analysis Unit (DAU) plans where CWD occurs, and these should be reviewed and revised as part of the regular DAU planning process.”
- Prioritization of herd management plan revisions when high prevalence herd
- Incorporation of CWD management objectives and reference the CWD Response Plan prevalence threshold
- Proactive Management before CWD hits thresholds
- For affected DAUs where prevalence exceeds 10%, herd management plans will be updated within 12 months if CWD is not already addressed in such plans. For other affected DAUs, measures for addressing CWD will be considered at the next scheduled plan update but within no more than 60 months.
- HMPs to define timeline to reduce prevalence below threshold (how quickly we’ll get there), not include the actual thresholds because the plans may get outdated if the threshold changes, honor statewide plan and respond within a certain period of time

APPENDIX I

POPULATION MODELS: A review of the modeling exercise used to find the survival rate that would lead to a declining statewide deer herd. To Be Completed After CWDAG Meeting 3

ASSUMPTIONS: Several assumptions were made when calculating the appropriate threshold for compulsory intervention for each species. First, CPW is taking a conservative approach by assuming all female mortality anticipated from CWD infection rates is additive mortality, even though some infected individuals will succumb to various causes of mortality before dying from CWD. Second, with the exception of adult female survival, all other population vital rate estimates reflect statewide averages and were held constant in the modeling exercise. These rates are assumed to be representative of each herd. Actual population vital rates for individual herds vary from the statewide average, which will be taken into account when prescribing management responses to CWD at the herd level.

APPENDIX II

CHAPTER W-0 - GENERAL PROVISIONS

ARTICLE XI - SPECIAL RESTRICTIONS

#021 - FEEDING OR ATTRACTING WILDLIFE

A. Except as provided in subsections (A)(1-4) of this regulation no person shall place, deposit, distribute or scatter grain, hay, minerals, salt, or other foods so as to intentionally constitute a lure, attraction or enticement for big game not lawfully held in captivity.

1. Crops and crop aftermath, including hay, alfalfa and grains, produced, harvested, stored or fed to domestic livestock in accordance with normal agricultural practices shall not be subject to this regulation.

2. When the Director determines it necessary to authorize feeding to prevent damage to private property.

3. When the Director determines it necessary to authorize feeding to mitigate the population loss anticipated by a predicted winter mortality that will exceed 30 percent of the adult female segment of a big game ungulate population in any one Game Management Unit.

4. When the Director determines it appropriate to feed big game as a part of a research or management program.

B. It shall be unlawful to place or deposit minerals or salt in an area so as to constitute a lure or attractant for wildlife. Nothing in this regulation shall restrict the use of salt or mineral blocks in normal agricultural practices.

APPENDIX III

COLORADO PARKS AND WILDLIFE COMMISSION POLICY TITLE: EMERGENCY WINTER FEEDING AND BAITING OF BIG GAME UNGULATES

Effective Date: November 20, 2015

I. PURPOSE

The purpose of this policy is to provide guidance in statewide approaches for emergency winter feeding and baiting of big game ungulates.

II. AUTHORITY

C.R.S. § 33-1-104 (1) “The commission is responsible for all wildlife management, for licensing requirements, and for the promulgation of rules, regulations, and orders concerning wildlife programs.”

III. POLICY STATEMENT

Emergency feeding of big game ungulates may be used as a last resort to reduce unusually severe winter-related mortality in cases where the anticipated winter-related mortality exceeds thirty percent (30%) of the adult female segment of a major big game population. Where available, managers should make use of existing on-the-ground ungulate monitoring activities and data to guide decisions on emergency feeding. Compared to small game, big game populations recover more slowly from significant winter mortality. Therefore, consideration should also be given to the effects of mortality on population recovery and associated impacts to local economies, license numbers, etc. The decision to feed in a severe winter is complex and will be made considering both biological and social factors. Based on the experience from previous feeding actions, significant mortality of deer, particularly fawns, should be expected regardless of effort. In addition, at least one year of suppressed recruitment likely will occur.

The decision of where and when to feed will be made by the Director after considering site-specific information (quantified to the extent possible) about the anticipated costs of feeding versus the consequences of not feeding. If feeding occurs, it is recommended to use weed-free hay (for elk) or commercial pellet products formulated for use in wild ungulates.

The Colorado Parks and Wildlife Commission recognizes the additional and unique threat created by congregating animals into feeding areas where chronic wasting disease (CWD) exposed animals may be present. Therefore, notwithstanding any other provision in this policy, emergency winter *feeding* shall not occur in any Game Management Unit (GMU) where CWD has been found in wild ungulate populations without prior approval of the Commission. In addition, managers should carefully consider whether winter feeding in a particular area might increase the risk of establishing CWD in an area where it is not known to occur.

Baiting is defined as the use of feed to move or redistribute animals with no intent to support or maintain animal condition. Baiting of big game ungulates may be used to prevent or reduce damage to private property when other preventative measures have been ruled impracticable, inappropriate or ineffective. Furthermore, when considering whether or not to bait, the cost of baiting relative to the estimated cost of damage to private property should be evaluated. Baiting may also be used to address the loss of animals unusually congregating near highways and railroad tracks (often as a result of severe winter weather). These

situations create a public hazard and can cause significant localized big game mortality. If baiting occurs, it is recommended to use weed-free hay or commercial pellet products specifically formulated for use in wild ungulates. The decision of where and when to bait will be made by the Director (or the Director's designee).

APPENDIX IV

COLORADO PARKS AND WILDLIFE COMMISSION POLICY TITLE: CHRONIC WASTING DISEASE

Effective Date: November 20, 2015

I. PURPOSE

The purpose of this policy is to provide guidance in statewide approaches for chronic wasting disease monitoring and control.

II. AUTHORITY

C.R.S. § 33-1-104 (1) “The commission is responsible for all wildlife management, for licensing requirements, and for the promulgation of rules, regulations, and orders concerning wildlife programs.”

III. POLICY STATEMENT

Chronic wasting disease (CWD) is a naturally-occurring prion disease of deer, elk and moose. CWD has been endemic in free-ranging cervid populations in north central Colorado and elsewhere since at least the early 1980s.

Chronic wasting disease is likely an additive source of mortality in affected deer populations, but the extent of harm depends on the extent of infection. Therefore, monitoring and controlling CWD in deer and elk populations are worthwhile objectives even though eradication of CWD in Colorado is not a realistic goal. The Commission encourages the Division to develop a system for tracking CWD trends in priority affected deer and elk populations and incorporating these data into population models so long-term impacts can be better understood. The Division should also consider pursuing adaptive management experiments to develop and evaluate management actions intended to reduce prevalence or prevent increases in distribution or prevalence. Where applicable, management actions to address CWD should be included in appropriate Data Analysis Unit (DAU) plans where CWD occurs, and these should be reviewed and revised as part of the regular DAU planning process. Wherever feasible, the Division should use hunting to achieve CWD management goals and deemphasize agency culling.

The risk of CWD spread via transport of carcasses appears small, especially when compared to the risk of introduction via the natural or human-assisted movement of living, infected animals. Thus, carcass transport and disposal safeguards should not be so onerous that they impede hunter participation in affected units. Education on proper disposal of deer and elk carcasses should be the primary strategy to minimize risks for spreading CWD via carcasses.

At this time there is no evidence that CWD poses a risk to human health. However, the Division should continue to ensure that current information relative to CWD is available to all prospective Colorado hunters. As currently operated, the Division’s carcass testing service primarily serves to allow individual hunters to minimize the risk of consuming an infected animal. Although data from voluntary testing submissions may have some information and management value, more rigorous surveillance should be undertaken when monitoring trends or estimating prevalence is the primary goal. When the Division requires that hunter-killed animals be submitted for testing, the Division should pay for these tests. In situations where CWD testing serves primarily as a customer service, strategies for reducing or recovering full costs and/or privatizing this program should be pursued.

The Commission recognizes the Division's ability to impact CWD is primarily limited by statutory authority to wild ungulate populations and specific commercial facilities. Because the Division shares statutory and regulatory responsibility for managing captive cervids with the Colorado Department of Agriculture (CDA), continued cooperation between the two agencies is required to comprehensively manage CWD in Colorado. In particular, the Division should maintain regulations governing the movement and management of captive cervids in order to minimize further spread of CWD.