

# Mesa de Maya Deer Herd Management Plan

## Data Analysis Unit D-33

GAME MANAGEMENT UNITS 137, 138, 143, 144



Created for:



**COLORADO**

**Parks and Wildlife**

Department of Natural Resources

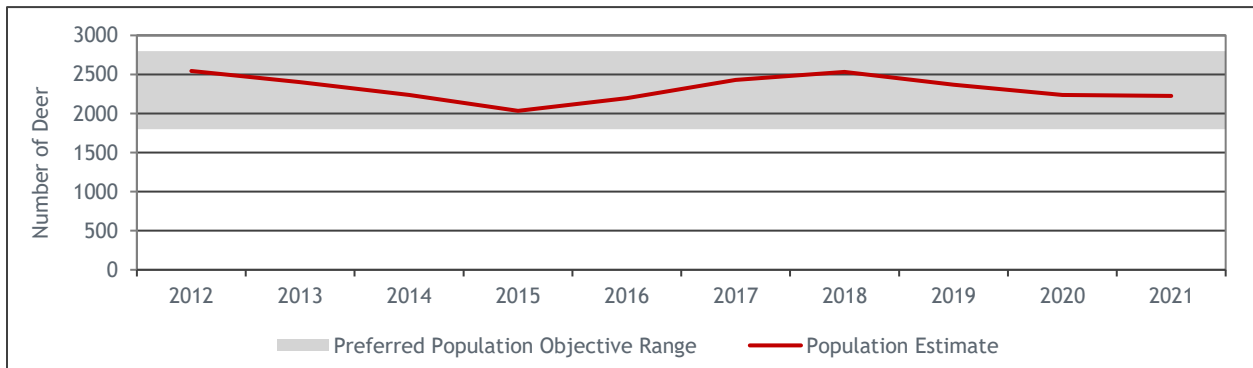
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Date: January 2023

## EXECUTIVE SUMMARY

<b>Mesa de Maya Deer Herd (DAU D33)</b> <b>GMUs: 137, 138, 143, 144</b>
<b>Post-Hunt Population:</b> Previous Objective: 2,350; Estimate for 2021: 2,250 deer <b>Current Objective: 2,000-3,500 deer</b>
<b>Post-Hunt Sex Ratio (Bucks:100 Does):</b> Previous Objective: 33 <b>No Sex Ratio Objective; Expected Sex Ratio Range: 20-50</b>



**Figure 1.** Mesa de Maya Deer Herd post-hunt population estimates and recommended population objective.

### DAU Amendments

For all previous D-33 herd management plans (HMP), the Mesa de Maya Deer DAU consisted of GMUs 143, 144, and 145. CPW is adjusting the DAU boundaries for D-33 by making the following changes:

- GMUs 137 and 138 are being added to D-33.
- GMU 145 is being removed from D-33 and added to D-28.

This plan is for the amended D-33 that contains GMUs: 137, 138, 143, and 144.

### Background Information

The Mesa de Maya DAU encompasses GMUs 137, 138, 143, and 144 in western Baca County and eastern Las Animas County. Approximately 82% of D-33 is in private ownership. The Comanche National Grasslands provides most of the DAU's public access.

For the last ten years there haven't been any significant management concerns in D-33. The population is relatively stable. Most landowners indicate that the deer population should be maintained or even increased. Deer are causing limited issues with crop damage. Most hunters are satisfied with their hunting experiences in D-33. The DAU offers hunters great opportunities to harvest mature mule deer bucks. Therefore, CPW recommends maintaining the current management strategy in D-33.

CPW conducted a mail survey before drafting this HMP to ascertain landowner opinions regarding deer management in D-33. In June 2021, surveys were mailed to 225 randomly selected landowners, representing ~50% of the DAU's landowners. When asked to indicate the number of deer they would like to see on their land relative to the current numbers, the highest percentage of landowners (43%) responded that they would like to see an increase in deer numbers. When

asked about their preferred buck:doe ratio, the majority of landowners (53%) indicated that they would like to see the buck:doe ratio maintained at its current level.

CPW also conducted a hunter survey for D-33, sending surveys to 200 hunters who had received at least one D-33 rifle, muzzleloader, or archery license for the 2018, 2019, and/or 2020 seasons. When asked about the number of deer they would like to see on the property they hunt, the highest percentage of hunters (45%) indicated that they would like to see an increase in deer numbers. Of those who would like to see a population increase, most called for a fifty percent increase in deer numbers. When asked about their preferred buck:doe ratio, the highest percentage of hunters (54%) indicated that they would like to see the buck:doe ratio maintained at its current level.

D-33 has a relatively small population with low deer densities. It is not cost-effective to conduct annual helicopter sex/age classification surveys due to the low densities. A useful computer population model cannot be produced without classification data. CPW generates rough population estimates for D-33 using buck harvest rates (see [Post-hunt Population Size](#), pg. 10). CPW recommends a large population objective range to account for the imprecision of the population estimate.

To inform license quota recommendations, CPW will use alternative metrics such as CWD sampling results, hunter/landowner surveys, harvest estimates, and personal communications with landowners and hunters. Every five years, CPW will conduct a landowner/hunter survey effort to identify if there are any new management concerns.

#### Population Objective Alternatives

**Alternative 1: 2,000-3,500 deer (approved alternative):** This alternative will maintain the population at the level observed in recent years. The proposed objective range is large due to the limitations making it challenging to estimate D-33's deer population. This range allows for population growth, which both landowners and hunters support. The deer herd has been managed within this range for the past 10 years.

**Alternative 2: 2,800-3,900 deer:** The hunter survey suggests that the majority of hunters and landowners would prefer this alternative. Most survey respondents indicated they would like to see a 50% increase in the D-33 population. However, even if all doe harvest was eliminated, the population may not be able to grow to this objective range. Currently, doe harvest accounts for just 1.6% of the estimated pre-hunt population. There are likely limitations to this population that are outside of CPW's control.

#### Sex Ratio Alternatives

**Alternative 1: *Expected sex ratio range of 20-50 bucks per 100 does (approved alternative):*** It is unlikely that CPW will collect sex ratio data in D-33 or be able to estimate sex ratios in D-33 accurately. We expect that sex ratios would fall within this range, especially with license quotas remaining similar to those set over the last ten years.

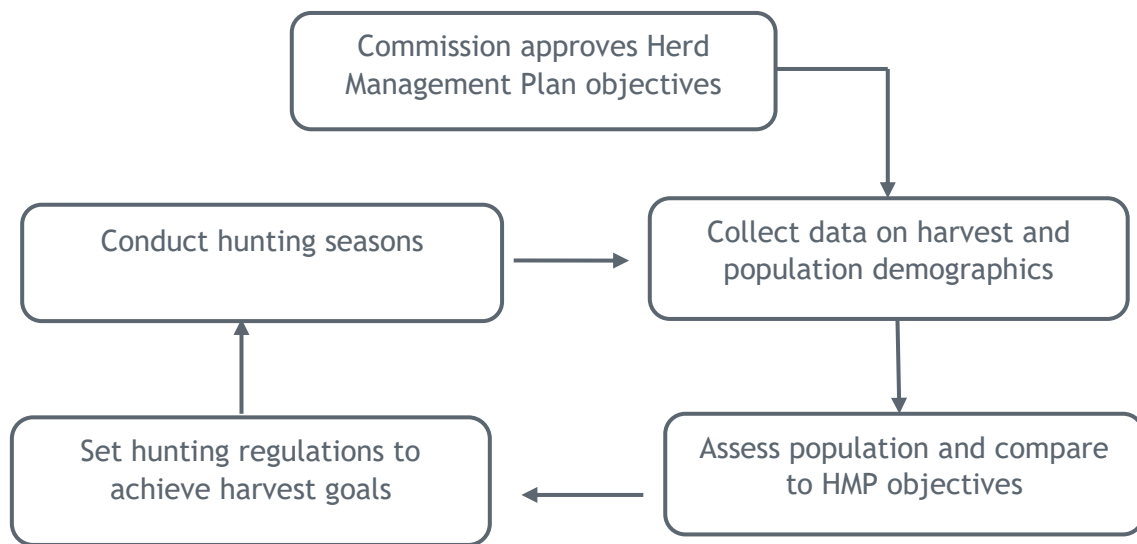
**Alternative 2: 28-38 bucks per 100 does (status quo).** This alternative would require managing with the use of annual sex/age classification flights. To manage within this range, CPW would need to utilize limited flight resources that may be better used in other deer DAUs with higher populations and/or densities.

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## INTRODUCTION AND PURPOSE

Colorado Parks and Wildlife (CPW) manages big game, including deer, for the use, benefit, and enjoyment of the people of the state in accordance with the CPW's Strategic Plan. Deer management is also determined by mandates from the Colorado Parks and Wildlife Commission (PWC) and the Colorado Legislature. Colorado's wildlife species require careful and increasingly intensive management to accommodate the many and varied public demands and growing human impacts. CPW uses a "Management by Objective" approach to manage the state's big game populations (Figure 3).



**Figure 2.** Management by Objective process used by Colorado Parks and Wildlife to manage big game populations by Data Analysis Unit (DAU).

With the Management by Objective approach, big game populations are managed to achieve population objectives established for a Data Analysis Unit (DAU). A DAU is the geographic area that includes the year-round range of a big game herd. A DAU includes the area where most animals in a herd are born, live, and die. DAU boundaries are delineated to minimize the interchange of animals between adjacent DAUs. A DAU may be divided into several Game Management Units (GMUs) to distribute hunters and harvest within a DAU.

Management decisions within a DAU are based on a herd management plan (HMP). The primary purpose of a herd management plan is to establish population and sex ratio (i.e., the number of males per 100 females) objectives for the DAU. The herd management plan also describes the strategies and techniques that will be used to reach these objectives. During the herd management planning process, public input is solicited and collected through questionnaires, public meetings, and comments to CPW staff and the PWC. The intentions of CPW are integrated with the concerns and ideas of various stakeholders including the State Land Board (SLB), the

Bureau of Land Management (BLM), city and county governments, hunters, guides and outfitters, private landowners, local chambers of commerce, and the public. In preparing a herd management plan, agency personnel attempt to balance the biological capabilities of the herd and its habitat with the public's demand for wildlife recreational opportunities and public tolerance for game damage. Herd management plans are approved by the PWC and are reviewed and updated approximately every ten years.

The herd management plan serves as the basis for the annual herd management cycle. In this cycle, the size and sex ratio composition of the herd is assessed and compared to the objectives defined in the herd management plan. Removal goals are set. Based on these goals, specific removal strategies are made for the coming year to either maintain the population or move it towards the established objectives (e.g., license numbers and allocation are set). Hunting seasons are then conducted and evaluated. The annual management cycle then begins again (Figure 2).

The purpose of this herd management plan is to set population and sex ratio objectives for the Mesa de Maya Deer Herd (D-33). The herd management plan will be in place from 2022 to 2032 with the expectation that it will be reviewed and updated in 2032.



## DATA ANALYSIS UNIT DESCRIPTION

### Location

The Mesa de Maya DAU (D-33) is located in southeastern Colorado (Figure 3). It encompasses GMUs 137, 138, 143, and 144 in western Baca County and eastern Las Animas County.

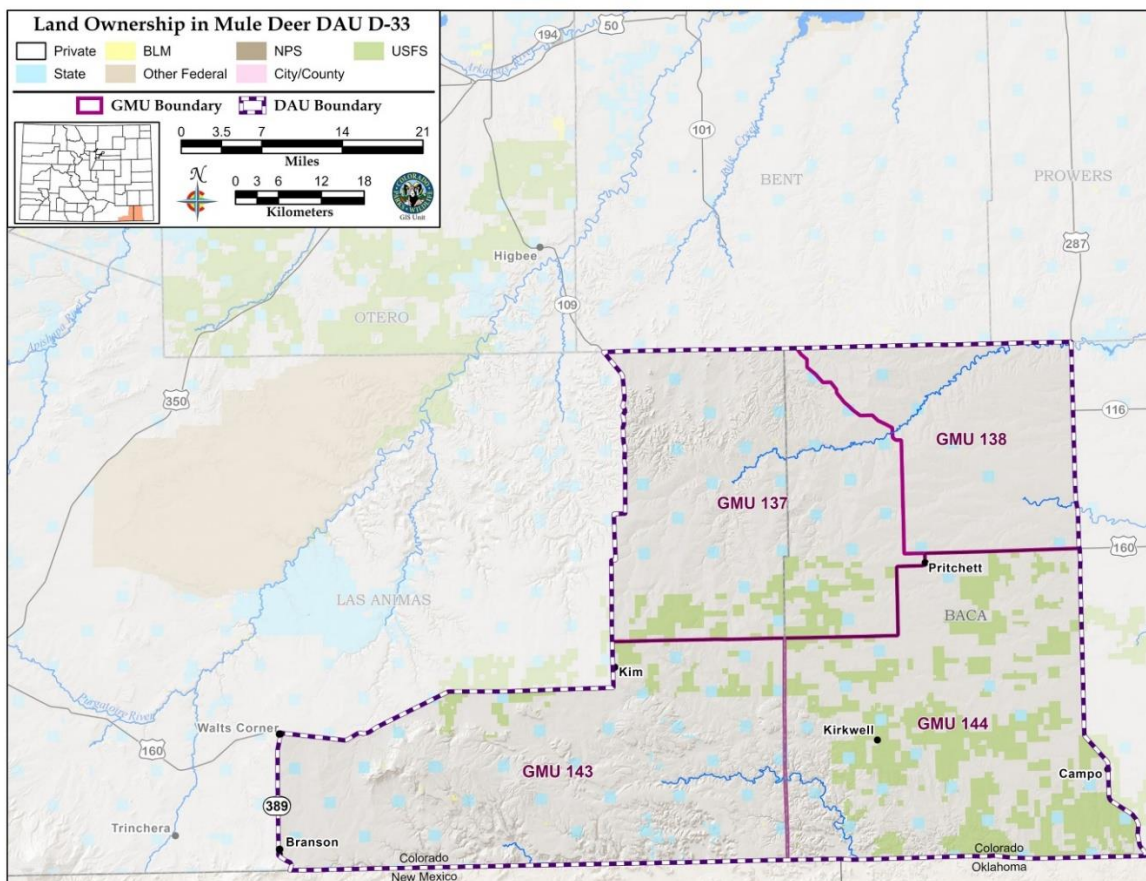


Figure 3. Location and Landownership Map of D-33, Mesa de Maya, GMUs 137, 138, 143, and 144.

### DAU Amendments

Prior to the approval of this plan, the Mesa de Maya DAU consisted of GMUs 143, 144, and 145. CPW is adjusting the DAU boundaries for D-33 by adding GMUs 137 and 138 and removing GMU 145. D-33 will swap GMUs with the adjacent Arkansas River deer DAU, D-28. The amended D-33 will consist of GMUs 137, 138, 143, and 144.

CPW is recommending the realignment of D-33 GMUs for three primary reasons. The first reason is that CPW would like to group GMUs that should be managed using alternative metrics instead of computer population models. Aerial classification surveys are not conducted in GMUs 137, 138, 143, and 144 because their deer densities are too low to justify the expense of helicopter surveys. D-33 cannot be managed with computer population modeling due to the lack of age/sex classification data. GMU 145 is being removed from D-33 and added to D-28 because its deer

densities are high enough to warrant aerial classification and management through computer modeling.

Another reason to amend D-33 is the species composition within the DAU. GMUs 137 and 138 were previously in D-28. White-tailed deer make up the majority of the deer in GMUs 122, 125, 126, 127, 129, 130, 132, 139, 145, and 146. These units will make up the new D-28. Most deer in GMUs 137, 138, 143, and 144 are mule deer. These units will make up the new D-33.

The third reason is connectivity within the Mesa de Maya Deer Herd. DAUs are defined as the geographic area that includes the year-round range of a big game herd. A DAU includes the area where most animals in a herd are born, live, and die. The geographic area within the new D-33 reflects the year-round range of the Mesa de Maya Deer Herd. The deer habitat in GMUs 137/138 shares more connectivity with the pinion/juniper canyons of D-33 than with the cottonwood/tamarisk/sand sagebrush drainages that contain most of the Arkansas River Deer Herd.

In contrast, the deer habitat in GMU 145 shares more connectivity with D-28's deer habitat than with D-33's habitat. The deer density in GMU 145 is highest in the eastern half of the GMU, primarily along the Cimarron River. A series of north/south drainages and irrigated farmland ties the Cimarron River deer to the deer found throughout GMU 139. There is likely far more deer movement between GMUs 145/139 than between GMUs 145/144.

**This plan is for the amended D-33 that contains GMUs: 137, 138, 143, and 144. The data presented and the language contained within this plan are specific to the new D-33. The previous population and sex ratio objectives are the only pieces in this plan that are specific to the old D-33 (pre-2022).**

### Physiography

The Mesa de Maya Deer DAU encompasses 1,086 mi<sup>2</sup>. Geography is varied and includes: cedar breaks, canyons, short grass prairie, sandsage rangelands, dryland farmlands, irrigated farmlands, ephemeral creeks, and arroyos. The DAU's namesake, Mesa de Maya, is the DAU's largest mesa. The northern and southern edges of the DAU consist of canyons and mesas. The central portion of the DAU consists of a shortgrass prairie that slowly increases in elevation from east to west. Most of D-33's croplands are scattered across this central prairie. The DAU's climate is characterized by long, hot summers and mild winters. Temperatures vary from below freezing in winter to well over 100° F in summer. Annual precipitation ranges from 11 to 16 inches, with a high proportion of the precipitation often coming from July-August monsoonal rains.

## HABITAT RESOURCES & CAPABILITIES

### Land Ownership

Most of the land in D-33 (82%) is privately owned. The United States Forest Service is the largest public landholder, with the Comanche National Grasslands accounting for 13% of the DAU. Other government agencies manage relatively small proportions of D-33, such as the State Land Board (4%), the Bureau of Land Management (0.03%), and CPW (1%). Approximately 16% of the DAU provides public hunting access.

### Land Use

Land use (both public and private) is almost exclusively agricultural. Approximately ninety



percent of D-33's lands are rangelands used for livestock grazing. Dryland and irrigated farmlands make up nine percent of the DAU. Most of the remaining acres (~2%) are previously farmed fields that were converted to stands of mid grass through the US department of Agriculture's Conservation Reserve Program (CRP). Much of the DAU consists of large ranches where hunting is one of the primary land uses, providing a significant portion of many ranches' revenue.

Land use in the DAU has not changed significantly in recent decades, except for changes due to wind energy development. The DAU currently has one wind farm and several others planned. Most of the grasslands within the DAU are presently under some wind energy planning or development stage.

#### Habitat Capability

D-33's deer are scattered throughout the DAU's pinion/juniper canyons, sandsage rangelands, and CRP grasslands. The Carrizo and Two Buttes drainages often contain the highest deer densities in the DAU. Portions of those pinion/juniper-covered drainages have crop fields that attract deer, especially in winter.

Drought conditions are common in D-33, limiting food sources in some years and reducing fawn production. In areas with farmland, deer have access to crops such as corn, alfalfa, milo, and wheat, that at times may increase the herd's productive capability. The greatest sources of D-33 deer mortality are thought to be human hunters, coyote predation of fawns, mountain lion predation, and disease. D-33's habitat likely plays the most significant role in limiting the DAU's population. On average, doe harvest removes just 1.6% of the estimated pre-hunt population, suggesting that hunter harvest may play a lesser role in maintaining the population at current levels.

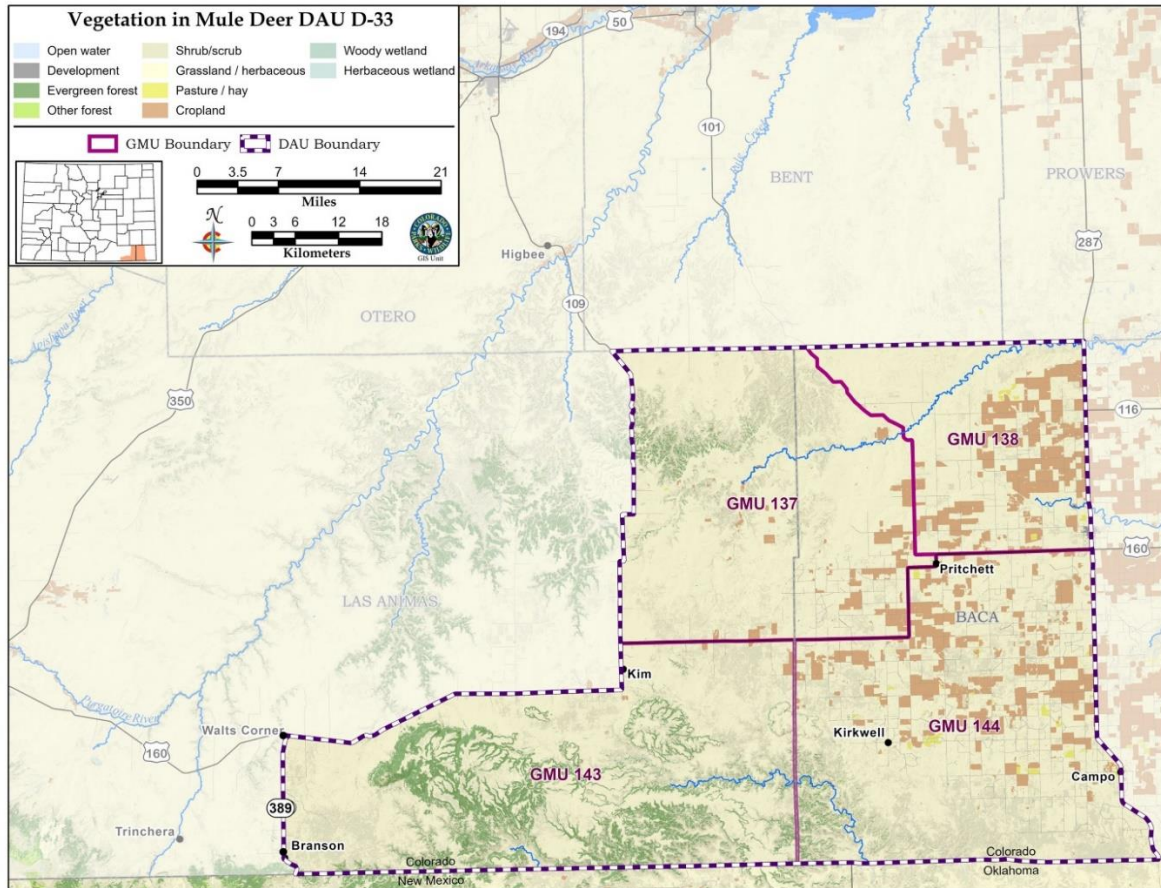


Figure 4. Land cover in the Mesa de Maya DAU.

### Conflicts with Agriculture

Deer cause crop damage in D-33, but most damage is relatively minor. No deer-caused game damage claims were filed from 2012 to 2021 in D-33. Occasionally, landowners reach out to District Wildlife Managers requesting game damage mitigation materials. The Landowner Solicitation Section (pg. 12) contains information regarding landowners' experiences with deer-caused crop damage.

### HERD MANAGEMENT HISTORY

#### Post-Hunt Population Size

Computer population models are currently the most accurate method of estimating population size for most of Colorado's deer herds (White and Lubow 2002). The population models incorporate observed post-hunt age and sex ratios, hunter harvest, estimated survival rates of adults and fawns, and wounding loss rates. Unfortunately, CPW cannot effectively use computer modeling for D-33. Deer densities are too low throughout the DAU to justify the expense of annual helicopter surveys. The D-33 computer model cannot be used to accurately estimate the population without including post-hunt age and sex ratio data.

To generate a rough population estimate for D-33, CPW uses buck harvest. A population estimate can be calculated by multiplying a DAU's 3-year average buck harvest by a factor of

17 (i.e., state buck harvest averages 5.9% of the post-hunt population, Watkins 2008). The resulting estimate is not as accurate as estimates generated from computer models with complete age/sex ratio data sets. While this method is not ideal, it does give a reasonable approximate estimate.

The D-33 population estimates for the last ten years range from 2,000 to 2,600 deer (average of 2,300; Figure 5). Deer license numbers in D-33 were changed very little from 2012 to 2021 and changes that were made did not result in variation in harvest. With deer license numbers being constant, CPW biologists think annual harvest changes were associated with population changes.

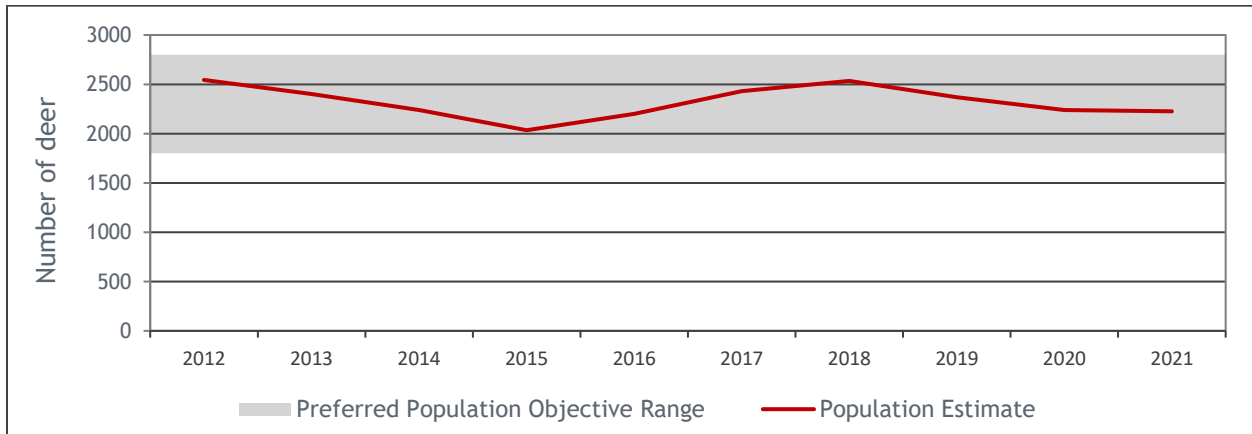


Figure 5. Mesa de Maya Deer Herd post-hunt population estimates and recommended population objective.

### Harvest and Hunters

From 2012 to 2021, license numbers in D-33 have remained stable, with around 280 deer licenses being issued annually (200 rifle, 40 archery, 40 muzzleloader). From 2012 to 2021 estimated harvest ranged from a low of 159 deer to a high of 215 deer, with an average harvest of 179 deer per year (Figure 6). Each year approximately 150 bucks and 50 does are harvested in D-33. Most of the harvest is of mule deer, with white-tailed deer accounting for just 5% to 15% of the annual harvest.

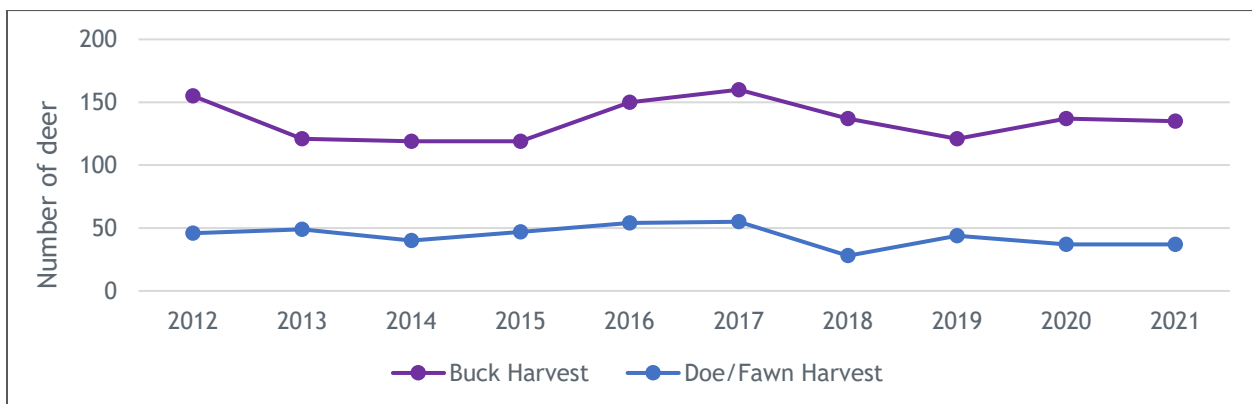


Figure 6. Estimated deer harvest for D-33, 2012-2021.

## Disease

The disease likely having the most significant impact in D-33 is Epizootic Hemorrhagic Disease (EHD), a virus spread to deer through bites from infected gnats. EHD, and to a lesser degree the related Blue Tongue Disease, will cause some level of deer fatalities every year in D-33. In most years, EHD-caused mortality rates are not high enough to significantly impact the population. Occasionally though, EHD has greatly affected D-33. In the drought years of 2012 and 2013, EHD was likely responsible for a sudden and notable decline in D-33's deer population. CPW personnel and landowners documented unusually high numbers of deer carcasses near stock tanks, ponds, and creeks during the early falls of 2012 and 2013. Necropsies were conducted on a few of those deer, and EHD was found to be responsible for the deaths.

Chronic Wasting Disease (CWD) is another disease that could have future impacts on D-33 deer. CWD is an infectious prion disease that affects cervids such as mule deer and white-tailed deer. CWD is always fatal, and deer infected with CWD die within two years of infection (Miller et al. 2012). In 2019 and 2020, CPW conducted mandatory sampling efforts in D-33. D-33 rifle hunters were asked to submit their deer for testing, and 187 samples were collected and tested. No positive cases of CWD were detected from D-33 deer through the mandatory sampling effort, suspect cases submitted by District Wildlife Managers, or voluntary hunter submissions. While CWD has not been detected in D-33, it has been detected in D-28 to the north. Therefore, CPW personnel anticipate CWD may spread to D-33.

## PUBLIC INVOLVEMENT

### Landowner Solicitation

Landowner input was essential to drafting this plan because of the predominance of private lands. We conducted a mail survey (Appendix A) to understand landowner opinions regarding deer management. In June of 2021, surveys were mailed to 225 randomly selected landowners, representing ~50% of the DAU's landowners. Only landowners who owned a minimum of a quarter section (160 acres) of land were included in the landowner selection pool. This was done to eliminate owners of smaller residential properties from the list. The questionnaire included eighteen questions and a postage-paid return envelope. CPW received completed surveys from 136 landowners.

### Landowners Survey Results

CPW asked landowners eighteen questions covering multiple topics (Appendix A). Of primary concern were landowner opinions regarding how/if they would like to see the population change (question #5), how/if they would like to see sex ratios change (question #6), and concern about game damage (questions #11-#14). The survey also included questions concerning other topics: hunter conflict, hunter access on private lands, species composition, species preference, CWD, and the likelihood of deer being found on their land.

When asked to indicate the number of deer they would like to see on their land relative to the current numbers, the highest percentage of landowners (43%) responded that they would like to see an increase in deer numbers. Most of those landowners called for a population increase of fifty percent. Thirty-four percent (34%) of landowners thought that deer numbers should remain at their current levels, and 11% thought that deer numbers should be reduced.

When asked about their preferred buck:doe ratio (Question #6, Appendix A), the majority of landowners (53%) indicated that they would like to see the buck:doe ratio maintained at its current level. Seven percent (7%) of landowners wanted the buck:doe ratio reduced, and 16%

percent wanted the ratio increased.

The landowner survey gives some indication of D-33 landowner experience with and sentiment towards deer-caused crop damage. Question #11 (Appendix A) of the landowner survey asked landowners how much deer damage to their crops they had experienced in 2020. Only 1% of respondents had experienced severe deer-caused crop damage, whereas 90% had experienced little-to-no damage. When asked how they felt about the amount of damage to their crops, 48% of landowners said they weren't concerned because the level of damage was minor, and 43% said the amount of damage was acceptable for having the deer around. Nine percent (9%) said the amount of damage was too high.

#### Hunter Solicitation

CPW sought hunter input regarding the Mesa de Maya population and targeted sex ratio by sending questionnaires with a pre-paid postage envelop to 200 hunters who had received at least one D-33 rifle, muzzleloader, or archery license for the 2018, 2019, and/or 2020 seasons. We received completed surveys from 92 hunters.

#### Hunter Survey Results

The hunter survey consisted of twelve questions covering multiple topics (Appendix B). The survey included one question related to population objective and one related to the sex ratio objective. The survey also included questions concerning other topics: perceived changes in deer numbers, concern regarding CWD, species composition and abundance, preferred species, and hunt code groupings.

When asked about the number of deer they would like to see on the land they hunt (Question #4, Appendix B), the highest percentage of hunters (45%) indicated a preference for an increase in deer numbers, with most of them responding that they wanted deer numbers increased by 50%. Forty-two percent (42%) of hunters wanted deer numbers maintained at their current level, and 3% wanted a reduction in deer numbers.

When asked about their preferred buck:doe ratio (Question #5, Appendix B), the highest percentage of hunters (54%) indicated that they would like to see the buck:doe ratio maintained at its current level. Twenty-nine percent (29%) of hunters responded that they would like an increase to the buck:doe ratio, 7% would like to see it decreased, and 10% were unsure whether they would want sex ratios changed.

#### Five-Year Survey Cycle

CPW recognizes that given the lack of sex/age classification data for D-33, landowner and hunter surveys provide some of the best indicators of what's going on with the Mesa de Maya Deer Herd. CPW plans to repeat the landowner and hunter survey at the mid-term of this plan, in 2027. The same questions will be used to best identify if there are any significant changes in responses regarding D-33's population, sex ratio, game damage, hunter conflict, hunter access on private lands, species composition, species preference, hunter satisfaction, and CWD. The data from the survey will be considered by CPW managers when making license quota recommendations.

#### 30-Day Comment Period

In addition to the survey, this draft herd management plan was open for review by the public for a 30-day comment period. It was posted 07/22/2022 on the CPW website at: <http://cpw.state.co.us/hmp> . A press release was issued by CPW on 07/21/2022 (Appendix



C). Copies of this plan were sent to the Colorado Cattleman's Association, State Land Board district managers for Districts 6 and 8, the Comanche National Grassland District Ranger and Biologist, and the county commissioners for Baca and Las Animas Counties. Comments from the 30-day comment period are found in Appendix D.

## MANAGEMENT ALTERNATIVES

### Population Objective

The population objective sets the targeted overall number of deer, regardless of sex or age class. CPW usually manages population size by adjusting the number of doe licenses because doe survival rates largely drive long-term trends in population size; however, the amount of buck harvest can still contribute to changes in population size on a shorter timescale.

D-33's estimated 2021 post-hunt population estimate was 2,250 deer. This population estimate is for the "new" D-33 with an adjusted boundary that includes GMUs 137, 138, 143, and 144. The previous Mesa de Maya DAU, which included GMUs 143, 144, and 145, had a population objective of 2,350 deer.

### Population Objective Alternatives

**Alternative 1: 2,000-3,500 deer (approved alternative):** This alternative will maintain the population at the level observed in recent years. The proposed objective range is large due to the limitations making it challenging to estimate D-33's deer population. This range allows for population growth, which both landowners and hunters support. The deer herd has been managed within this range for the past 10 years.

**Alternative 2: 2,800-3,900 deer:** The hunter survey suggests that the majority of hunters and landowners would prefer this alternative. Most survey respondents indicated they would like to see a 50% increase in the D-33 population. However, even if all doe harvest was eliminated, the population may not be able to grow to this objective range. Currently, doe harvest accounts for just 1.6% of the estimated pre-hunt population. There are likely limitations to this population that are outside of CPW's control.

### Sex Ratio Alternatives

**Alternative 1: *Expected sex ratio range of 20-50 bucks per 100 does (approved alternative):*** It is unlikely that CPW will collect sex ratio data in D-33 or be able to estimate sex ratios in D-33 accurately. We expect that sex ratios would fall within this range, especially with license quotas remaining similar to those set over the last ten years.

**Alternative 2: 28-38 bucks per 100 does (status quo).** This alternative would require managing with the use of annual sex/age classification flights. To manage within this range, CPW would need to utilize limited flight resources that may be better used in other deer DAUs with higher populations and/or densities.

### Strategies to Achieve Herd Management Objectives

- **License Setting Through Alternative Metrics:** Low deer densities prevent D-33 from being managed with the traditional computer population modeling approach. For CPW managers to make informed license quota recommendations, they will use alternative metrics such as hunter/landowner surveys, harvest estimates, and personal communications with landowners and hunters. Every five years, CPW will conduct a landowner/hunter survey effort, repeating the same surveys used to develop this plan. Using the same survey questions will make it easier to determine if landowner/hunter



responses indicate changes in D-33 that need to be addressed with modifications to license quota.

- **Population Objective:** CPW has been managing D-33's population within the recommended population objective range for the last ten years. CPW's population management strategy is to maintain license numbers at the levels they've been set for the past ten years. CPW will make necessary changes to quota when alternative metrics indicate a quota change is warranted. The preferred population objective range is large relative to objectives from other deer herds. CPW recommends this wide range because it's an achievable objective despite the lack of annual aerial sex/age classification data. The wide objective range also gives CPW more flexibility to make license quota adjustments based on alternative metrics while reasonably expecting that the population remains within the objective range.
- **Sex Ratio Objective:** There would be no sex ratio objective for the DAU, but instead an "expected sex ratio range." Expected sex ratio ranges have traditionally been utilized for elk DAUs with an over-the-counter unlimited licensing strategy, where it's difficult to control sex ratios. Using an expected sex ratio range would be appropriate for this management strategy due to the expected lack of sex classification data.

#### Strategies for Addressing Management Concerns

For many years, there haven't been any major management concerns in D-33. All indications suggest that the population remains relatively stable. Most hunters are satisfied with their hunting experiences in D-33. There are relatively few issues with deer causing crop damage. The DAU offers hunters great opportunities to harvest mature mule deer bucks. Most landowners enjoy the deer, wanting the deer population to be maintained or even increased.

The greatest future management concern in D-33 is CWD. No CWD-positive animals have been detected in D-33, but it may be a matter of time until CWD shows up in the DAU. Having a relatively wide population objective range will give CPW more flexibility to change license quota in response to changing CWD prevalence rates.

By conducting hunter and landowner surveys every five years, CPW will have a formalized process to keep informed about landowner and hunter opinions regarding: D-33's population, sex ratio, game damage, hunter conflict, hunter access on private lands, species composition, species preference, and CWD. CPW managers will use the results of the surveys to identify any new management concerns that arise.

The Colorado Parks and Wildlife Commission approved this plan on January 18, 2023.

## APPENDIX A: Landowner Survey with Results

Dear Landowner / Operator,

As a landowner and/or agricultural producer, you are important to the conservation of Colorado's deer herds. To better understand opinions of landowners and agricultural producers about deer management in Southeastern Colorado, you have been randomly selected to complete the attached questionnaire. As only a sample of landowners/ operators were selected for this survey, your response is important. Colorado Parks and Wildlife plans to emphasize landowner input in deer management decisions. Please take a few minutes to fill out this short survey and return it in the enclosed postage-paid envelope.

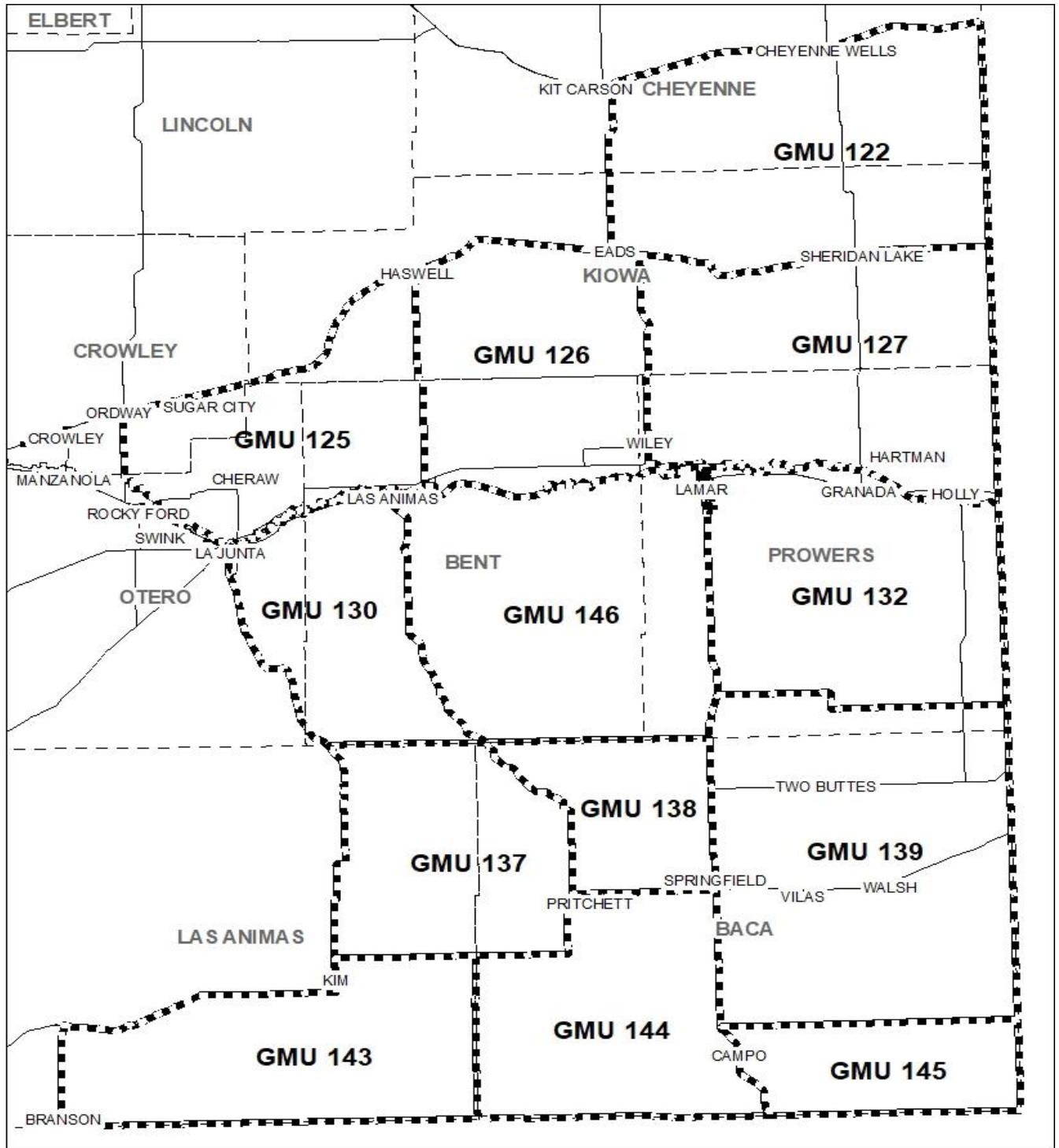
Thank you for your participation. All data gathered will remain confidential and at no time will your name be associated with any of your responses. If you have any questions about this survey, please contact me at 719-691-9130 or [jonathan.reitz@state.co.us](mailto:jonathan.reitz@state.co.us)

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan Reitz". The signature is stylized and cursive, with a large loop at the end.

Jonathan Reitz  
Wildlife Biologist  
Colorado Parks and Wildlife

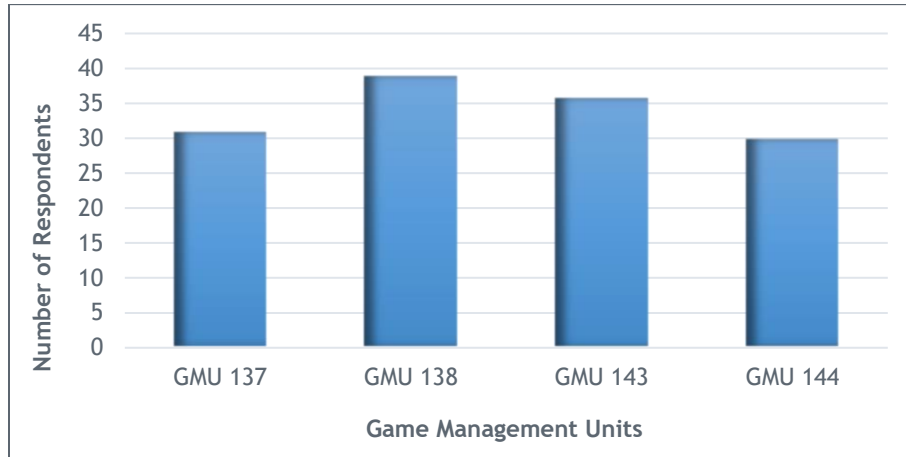
# Game Management Units



Please complete the following questions regarding your acreage in eastern Colorado.

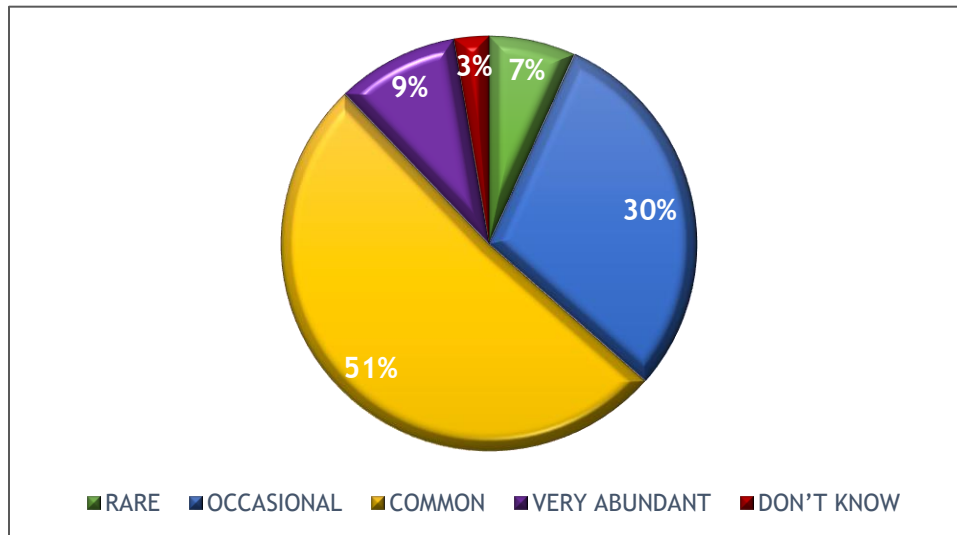
**1. Which of the following Game Management Units do you own at least 80 acres of land within?**  
(Check all that apply; refer to the map on pg.2)

- I do not own 80 acres of property in any of the following Game Management Units.
- GMU 137
- GMU 138
- GMU 143
- GMU 144



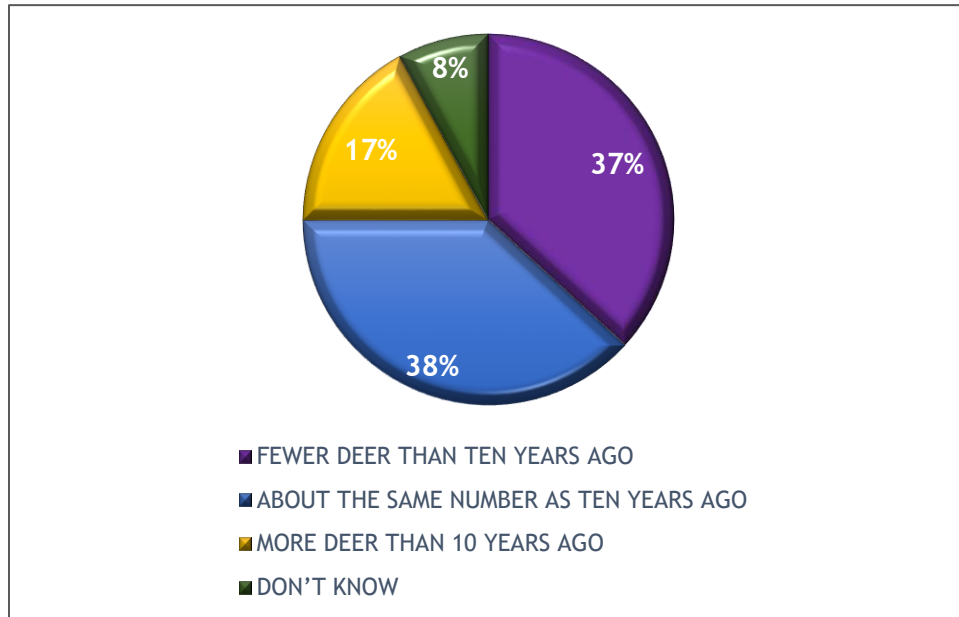
**2. How abundant (in an average year) are mule deer and/or white-tailed deer on your land?**

- NONE
- RARE
- OCCASIONAL
- COMMON
- VERY ABUNDANT
- DON'T KNOW



3. Over the last 10 years, what trend have you seen in the overall deer population on your land?

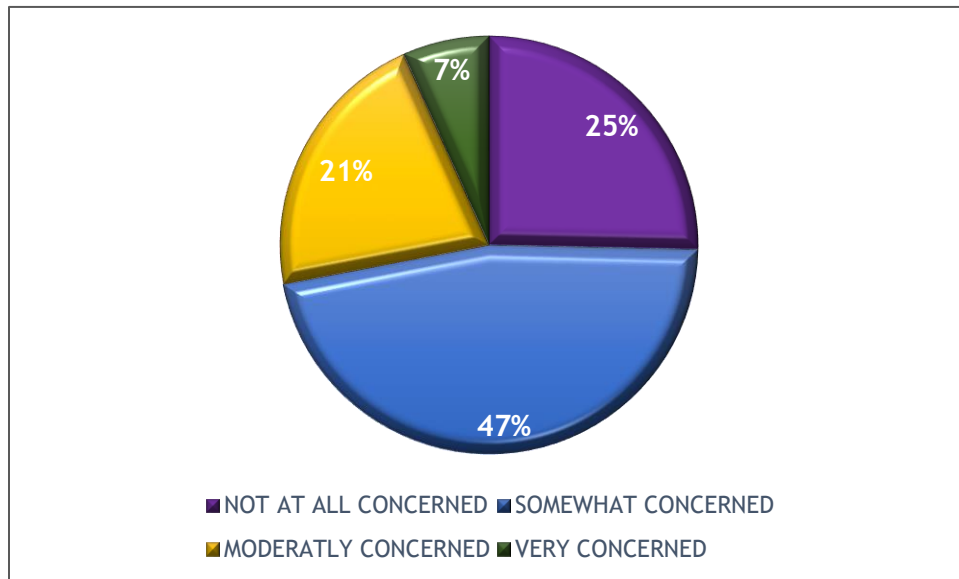
- FEWER DEER THAN TEN YEARS AGO
- ABOUT THE SAME NUMBER AS 10 YEARS AGO
- MORE DEER THAN 10 YEARS AGO
- DON'T KNOW



4. **Chronic Wasting Disease (CWD)** is a disease of deer and elk that causes behavioral changes and progressive loss of body condition, eventually leading to death. There is no known treatment of the disease. In 2019 and/or 2020, mandatory sampling of hunter harvested deer was conducted in all of the Game Management Units shown on pg. 2. In GMUs along the Arkansas River Valley, 9.3% of mature whitetail bucks and 8.3% of mature mule deer bucks tested positive for CWD. No CWD was detected in the GMUs along the CO/New Mexico and CO/Oklahoma border. Evidence shows that high deer densities and a higher proportion of adult males in a population leads to higher disease prevalence rates. Maintaining a low density and younger age herd with fewer mature bucks may result in lower CWD rates in a population.

**Please check the box that corresponds with your level of concern regarding impacts that CWD may have on the deer population on your land.**

- NOT AT ALL CONCERNED
- SOMEWHAT CONCERNED
- MODERATLEY CONCERNED
- VERY CONCERNED





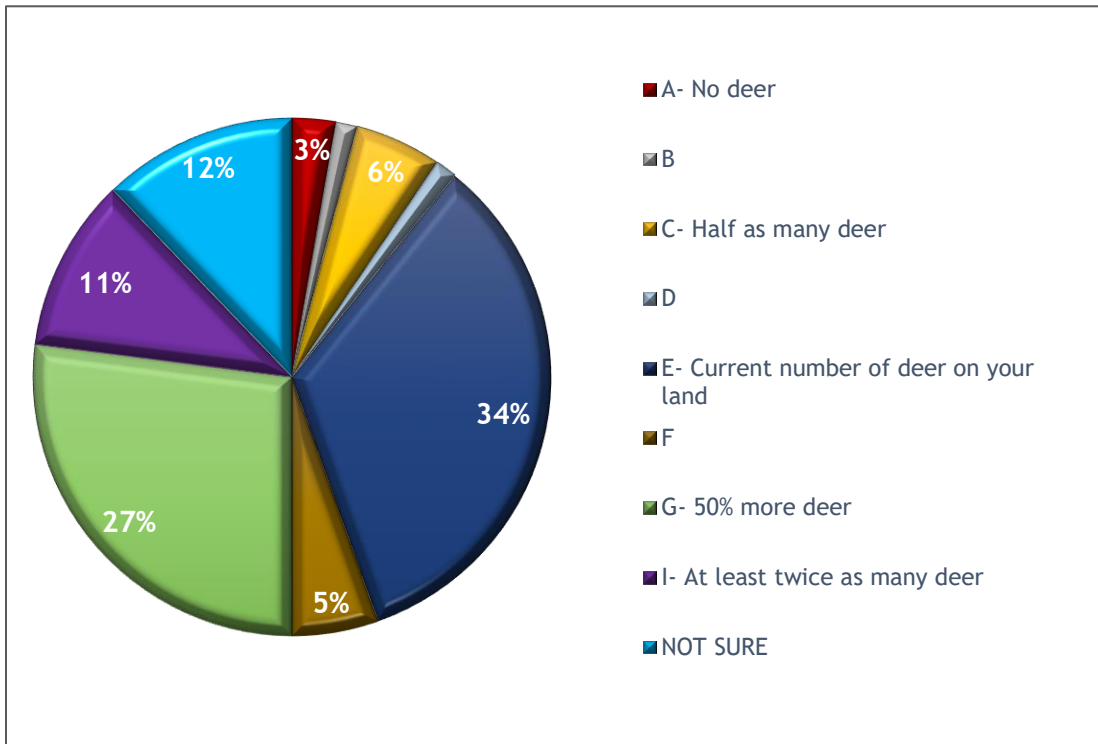
5. **DEER POPULATION:** An increase in deer numbers may result in an increase in damage caused by deer and will mean that more hunting licenses will need to be issued to manage deer numbers. Conversely, a reduction in deer numbers will ultimately result in fewer deer hunting licenses and more difficulty drawing deer hunting licenses. The letter E below represents the number of mule deer and/or white-tailed deer on and nearby your land in 2020. **Select a letter (A through I) to indicate the number of deer you would like to see on your land and in the surrounding area.**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	
no deer		Half as many deer		Current number of deer on your land		50% more deer		At least twice as many deer	
Fewer deer									More deer

Circle one letter below for your reasonable goal or check the statement below the letters.

A B C D E F G H I

OR  I AM NOT SURE HOW MANY DEER WOULD BE A REASONABLE GOAL.



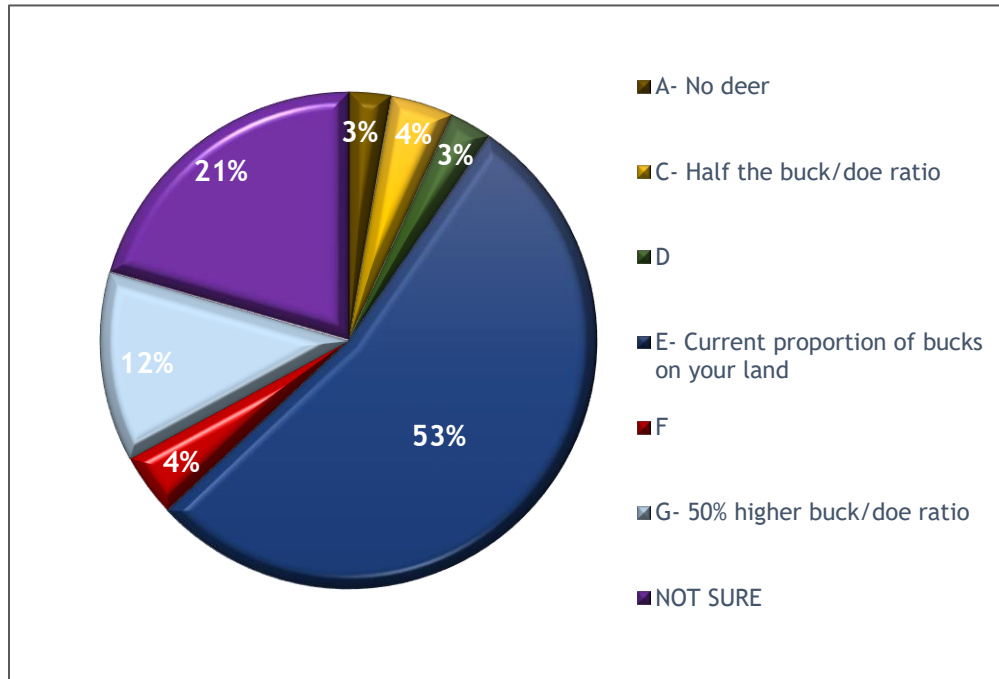
**6. BUCK/DOE RATIO:** The buck/doe ratio is the proportion of bucks relative to does in the deer population. In general, an increase in the buck/doe ratio may require a decrease in the number of buck hunting licenses, which could make buck licenses more difficult to draw. Conversely, a decrease in the buck/doe ratio may require an increase in buck hunting licenses, which could make buck licenses easier to draw. Also, a decrease in the buck/doe ratio is likely to result in lower CWD prevalence in the population, which would likely result in a healthier and more sustainable deer population. **Select a letter (A through I) to indicate the buck/doe ratio you think would be a reasonable goal to work towards for the deer population on your land.**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>				
no deer		Half the buck/doe ratio		Current proportion of bucks on your land		50% higher buck/doe ratio		At least twice the buck/doe ratio				
Fewer bucks									More bucks			

Circle one letter below for your reasonable goal or check the statement below the letters.

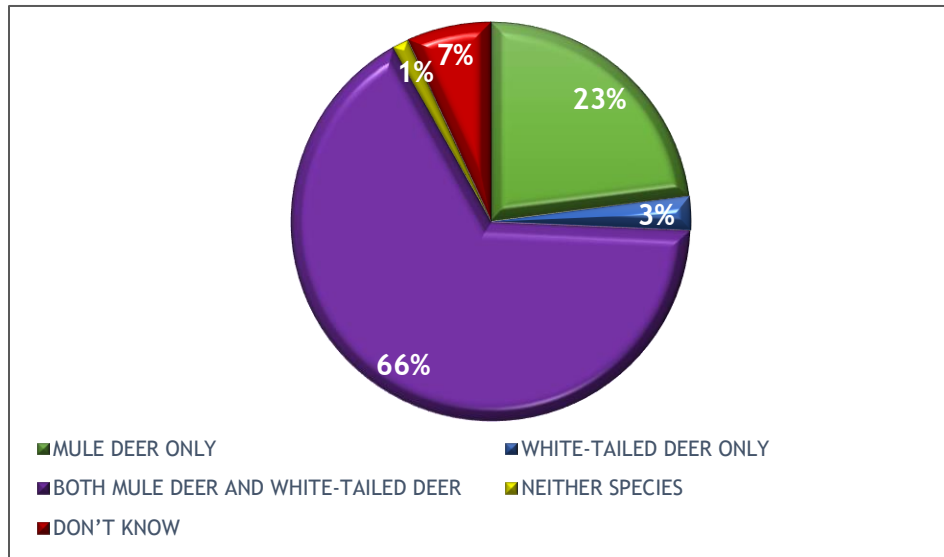
A B C D E F G H I

OR  I AM NOT SURE WHAT BUCK/DOE RATIO ON MY LAND WOULD BE A REASONABLE GOAL.



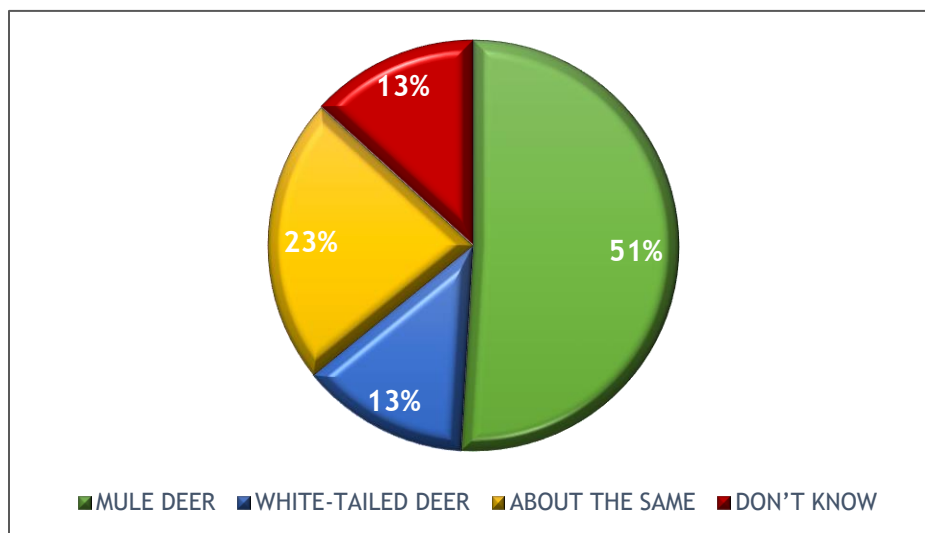
7. Which species of deer use your land?

- MULE DEER ONLY
- WHITE-TAILED DEER ONLY
- BOTH MULE AND WHITE-TAILED DEER
- NEITHER SPECIES
- DON'T KNOW



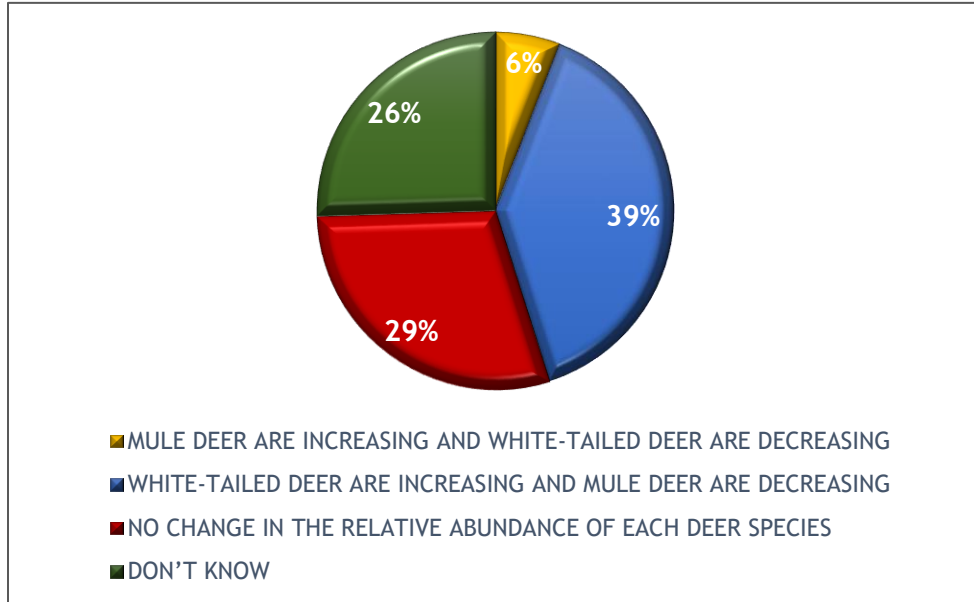
8. If both mule and white-tailed deer use your land, which species is most abundant? (leave blank if only one species is found on your land)

- MULE DEER
- WHITE-TAILED DEER
- ABOUT THE SAME (50:50)
- DON'T KNOW



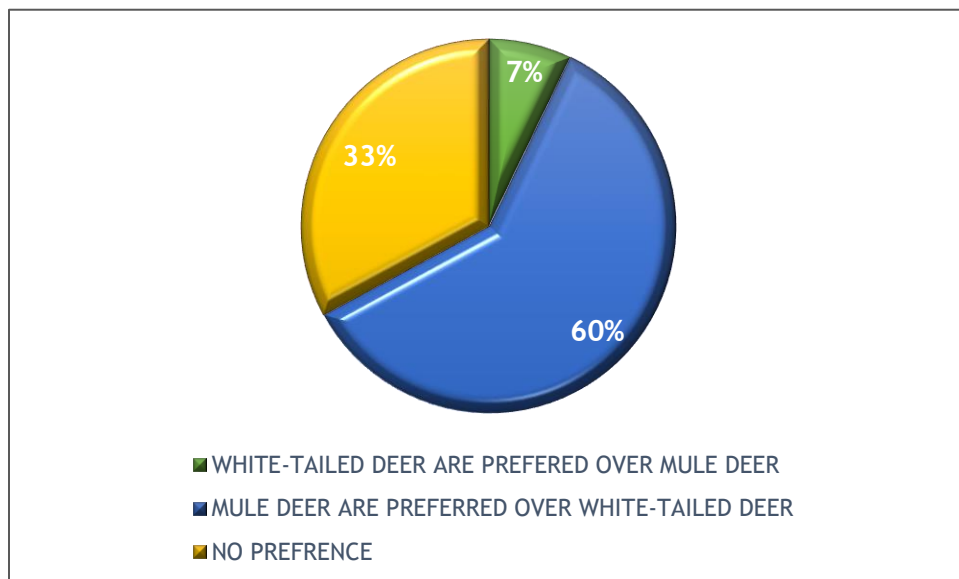
9. If both mule and white-tailed deer use your land, has the relative abundance of each species changed in the last 10 years? (leave blank if only one species is found on your land)

- MULE DEER ARE INCREASING and WHITE-TAILED DEER ARE DECREASING
- WHITE-TAILED DEER ARE INCREASING and MULE DEER ARE DECREASING
- NO CHANGE IN THE RELATIVE ABUNDANCE OF EACH DEER SPECIES
- DON'T KNOW



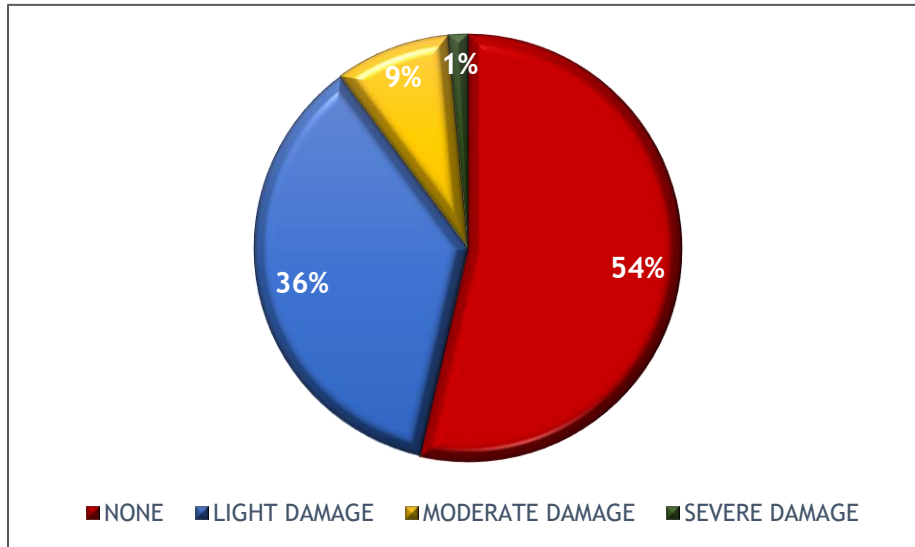
10. Do you have a preference for one deer species over another?

- WHITE-TAILED DEER ARE PREFERRED OVER MULE DEER
- MULE DEER ARE PREFERRED OVER WHITE-TAILED DEER
- NO PREFERENCE



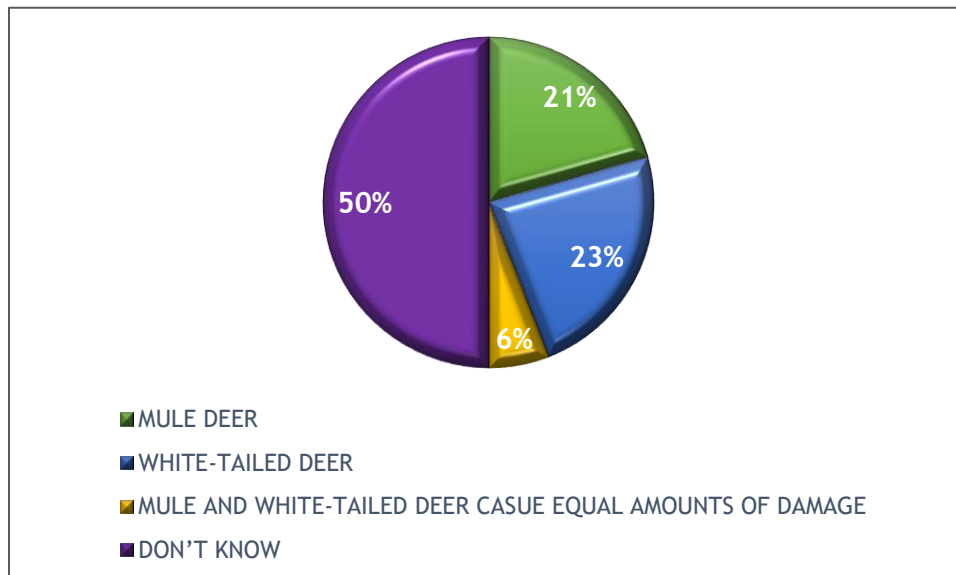
11. How much deer depredation/damage to your crops or other property did you experience in 2020?

- NONE : skip to Question # 14
- LIGHT DAMAGE
- MODERATE DAMAGE
- SEVERE DAMAGE



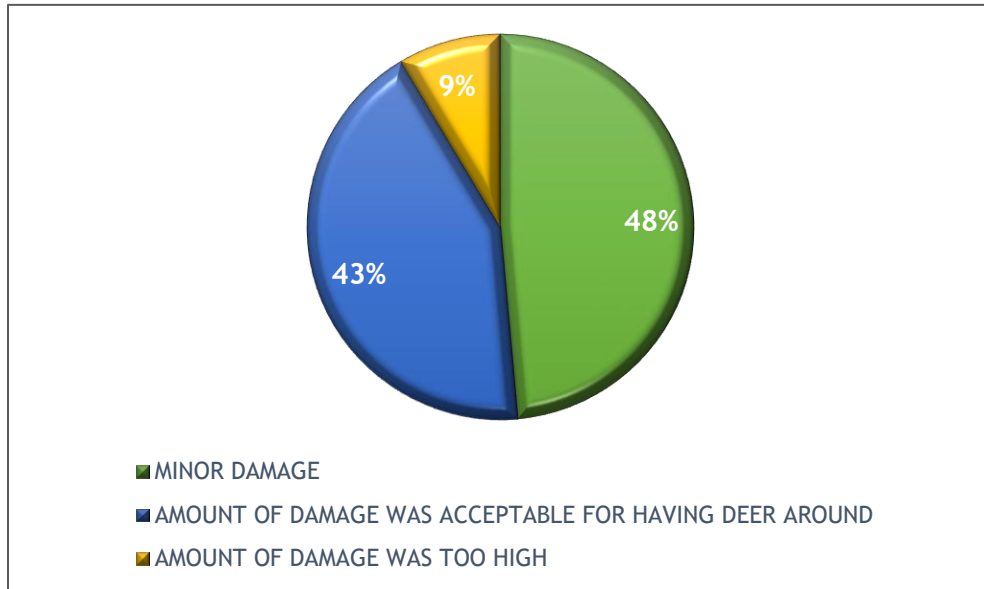
12. Which deer species caused the most damage?

- MULE DEER
- WHITE-TAILED DEER
- MULE AND WHITE-TAILED DEER CAUSE EQUAL AMOUNTS OF DAMAGE
- DON'T KNOW



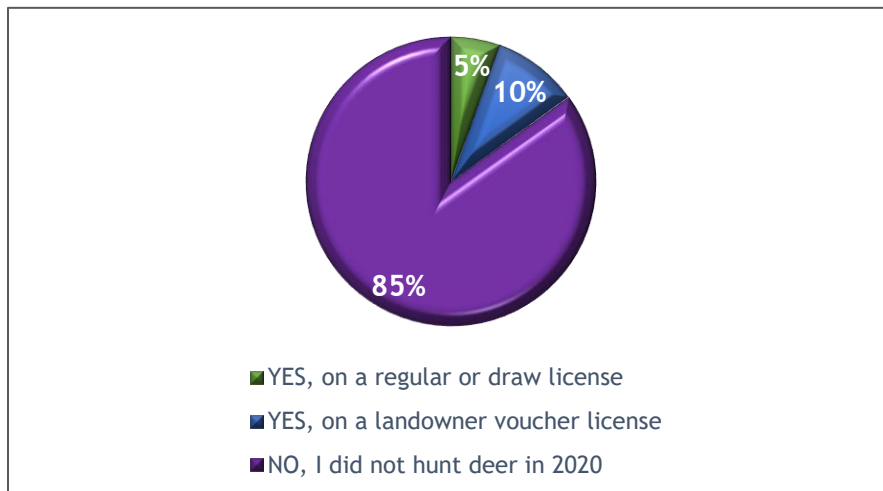
13. How do you feel about the amount of depredation/damage to your crops in 2020?

- MINOR DAMAGE
- AMOUNT OF DAMAGE WAS ACCEPTABLE FOR HAVING DEER AROUND
- AMOUNT OF DAMAGE WAS TOO HIGH



14. Did you hunt for deer during the 2020 season?

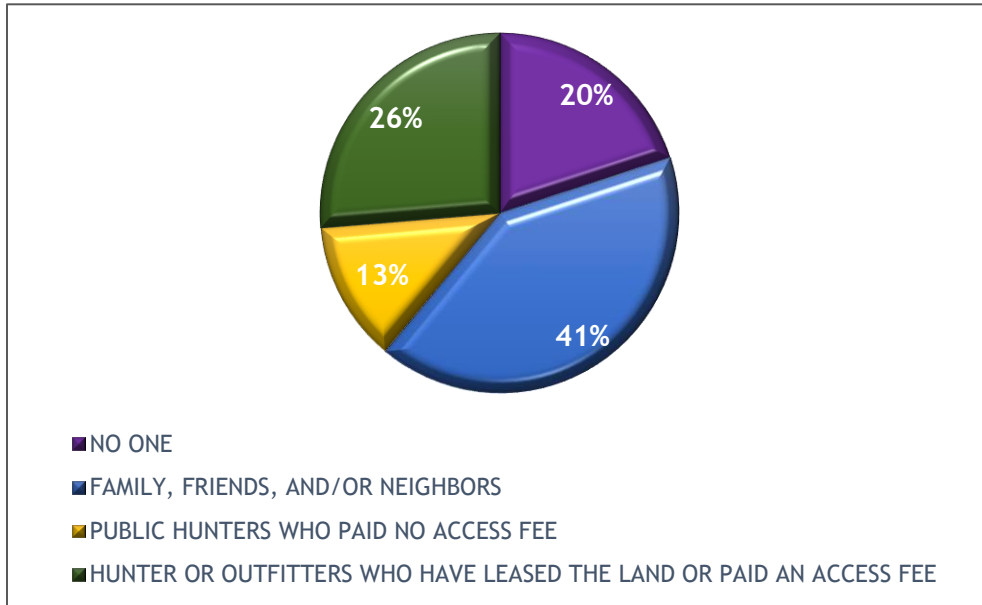
- YES, on a regular or draw license
- YES, on a landowner voucher license
- NO, I did not hunt deer in 2020





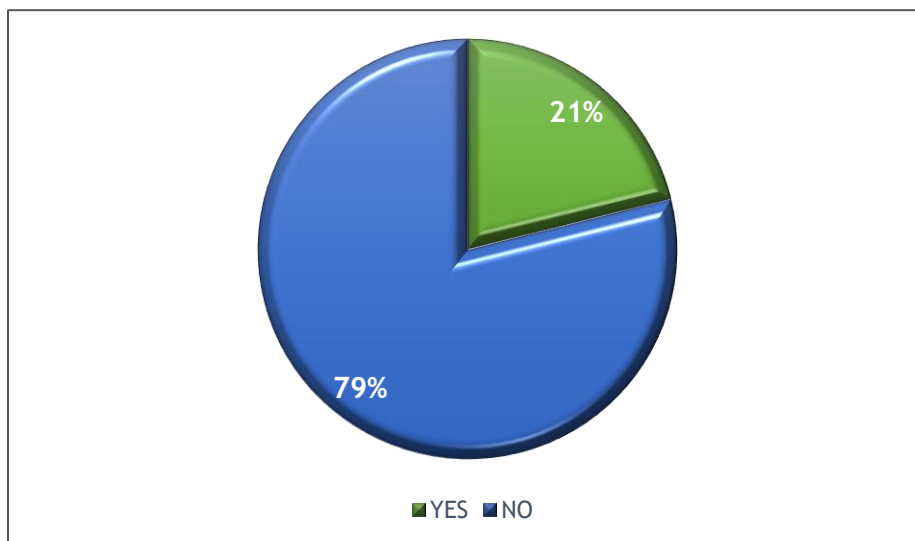
15. Whom did you allow to hunt deer on land you control in 2020? (Check all that apply)

- NO ONE
- FAMILY, FRIENDS, AND/OR NEIGHBORS
- PUBLIC HUNTERS WHO PAID NO ACCESS FEE
- HUNTERS OR OUTFITTERS WHO HAVE LEASED THE LAND OR PAID AN ACCESS FEE



16. During 2020, did you have any problems with deer hunters on your land?

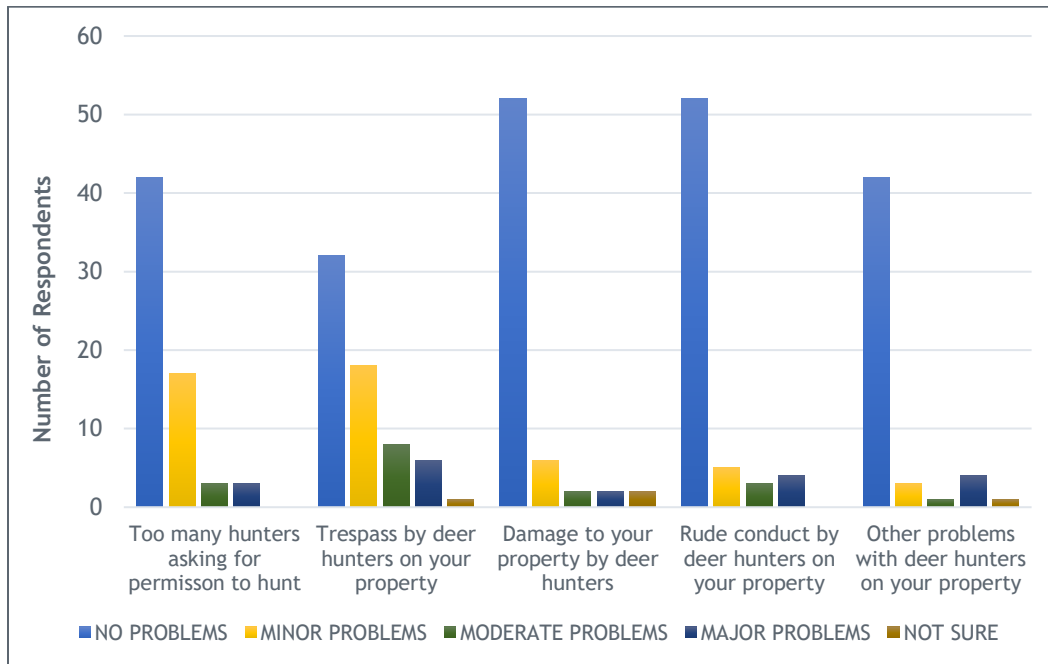
- YES
- NO



17. Rate the level to which you experienced these problems with deer hunters in 2020. (*✓one box per row*)

	NO PROBLEMS	MINOR PROBLEMS	MODERATE PROBLEMS	MAJOR PROBLEMS	NOT SURE
A. TOO MANY Hunters asking for permission to hunt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. TRESPASS by deer hunters on your property	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. DAMAGE to your property by deer hunters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. RUDE CONDUCT by deer hunters on your property	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. OTHER problems with deer hunters on your property	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SPECIFY: \_\_\_\_\_

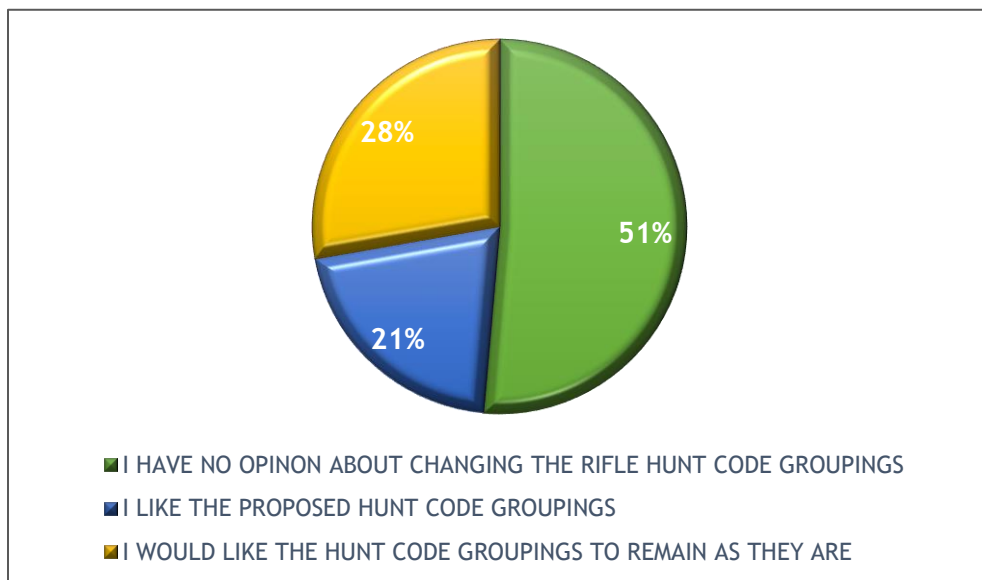


18. CPW often combines Game Management Units into hunt code groupings. This gives a deer hunter the ability to hunt any GMU within the hunt code grouping listed on their license. CPW is considering changing the RIFLE hunt code groupings for the GMUs shown on pg. 2. This would reduce complexity for hunters and CPW staff, offer more opportunity to hunters, and reduce the number of private properties split into more than one hunt code grouping. This would also improve population management by combing GMUs with shared and/or similar habitats. The proposed hunt code groupings would likely result in minor changes to the probability of drawing licenses for specific areas. The proposed hunt code groupings for the RIFLE SEASONS are listed here:

- GMUs 122, 127, and 132
- GMUs 126 and 146
- GMUs 125 and 130
- GMUs 137, 138, 143, and 144
- GMUs 139 and 145

Select the option that best describes your opinion regarding the proposed changes to hunt code groupings.

- I HAVE NO OPINION ABOUT CHANGING THE RIFLE HUNT CODE GROUPINGS
- I LIKE THE PROPOSED HUNT CODE GROUPINGS
- I WOULD LIKE THE HUNT CODE GROUPINGS TO REMAIN AS THEY CURRENTLY ARE



**Thank you for completing this survey.**

If you have comments about deer hunting in Colorado, please write them on the back of this survey or email them to: [jonathan.reitz@state.co.us](mailto:jonathan.reitz@state.co.us)

Please return your survey in the envelope provided. If you misplaced your envelope, you can return the survey to: Jonathan Reitz, Colorado Parks and Wildlife, 2500 S. Main St., Lamar, CO 81052

## APPENDIX B: Hunter Survey with Results

dear Hunter,

As a hunter, you are important to the conservation of Colorado's deer herds. To better understand opinions of hunters about deer management in Southeastern Colorado, you have been randomly selected to complete the attached questionnaire. As only a sample of hunters were selected for this survey, your response is important. Colorado Parks and Wildlife plans to emphasize hunter input in deer management decisions. Please take a few minutes to fill out this short survey and return it in the enclosed postage-paid envelope. Please note that all of the survey questions are only in regards to deer and deer hunting in the Game Management Units shown on pg. 2.

Thank you for your participation. All data gathered will remain confidential and at no time will your name be associated with any of your responses. If you have any questions about this survey, please contact me at 719-691-9130 or [jonathan.reitz@state.co.us](mailto:jonathan.reitz@state.co.us)

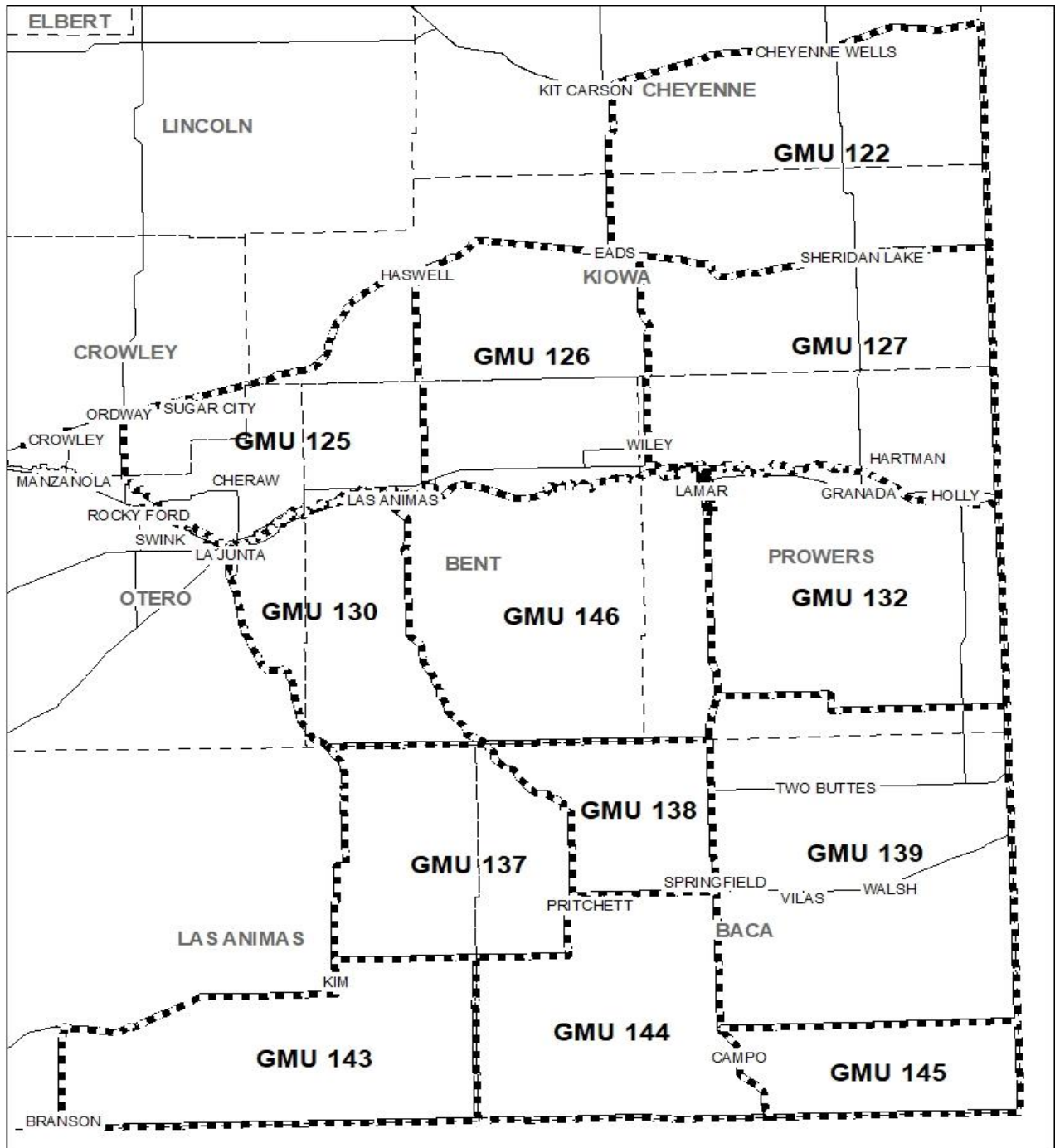
Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan Reitz". The signature is fluid and cursive, with a large loop at the end.

Jonathan Reitz  
Wildlife Biologist  
Colorado Parks and Wildlife

# Game Management Units

\*Note: Survey is only in regards to these GMUs.

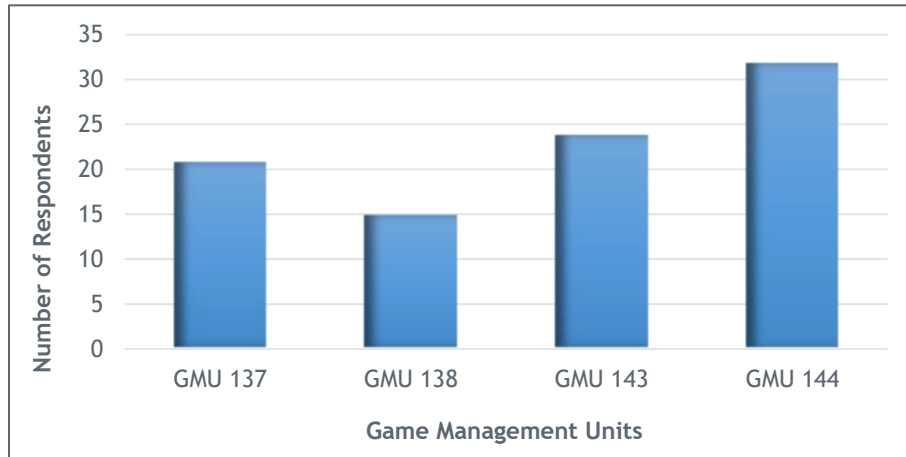


  County Boundary  
   GMU Boundaries  
 — Highways

Please complete the following questions regarding the GMU(s) shown on pg. 2 that you hunt.

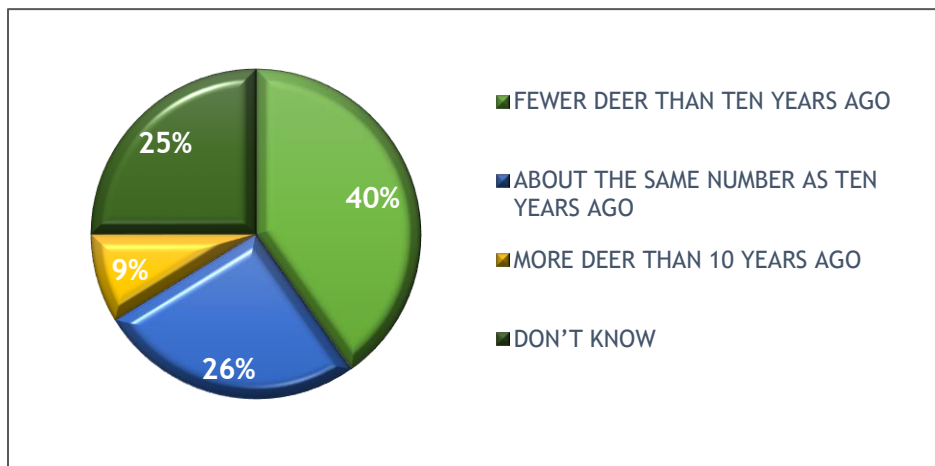
1. Which of the following Game Management Units did you hunt deer in from 2018-2020?  
(Check all that apply; refer to the map on pg.2)

- I do not hunt in any of the following Game Management Units.
- GMU 137
- GMU 138
- GMU 143
- GMU 144



2. Over the last 10 years, what trend have you seen in the overall deer population where you hunt?

- FEWER DEER THAN TEN YEARS AGO
- ABOUT THE SAME NUMBER AS 10 YEARS AGO
- MORE DEER THAN 10 YEARS AGO
- DON'T KNOW

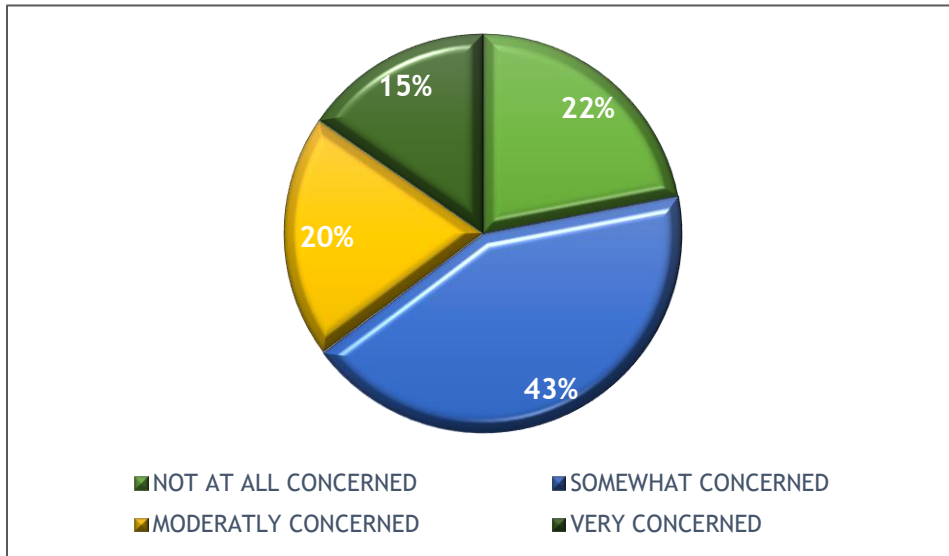




3. **Chronic Wasting Disease** (CWD) is a disease of deer and elk that causes behavioral changes and progressive loss of body condition, eventually leading to death. There is no known treatment of the disease. In 2019 and/or 2020, mandatory sampling of hunter harvested deer was conducted in all of the Game Management Units shown on pg. 2. In GMUs along the Arkansas River Valley, 9.3% of mature whitetail bucks and 8.3% of mature mule deer bucks tested positive for CWD. No CWD was detected in the GMUs along the CO/New Mexico and CO/Oklahoma border. Evidence shows that high deer densities and a higher proportion of adult males in a population leads to higher disease prevalence rates. Maintaining a low density and younger age herd with fewer mature bucks may result in lower CWD rates in a population.

**Please check the box that corresponds with your level of concern regarding impacts that CWD may have on the deer population in the area you hunt.**

- NOT AT ALL CONCERNED
- SOMEWHAT CONCERNED
- MODERATLEY CONCERNED
- VERY CONCERNED



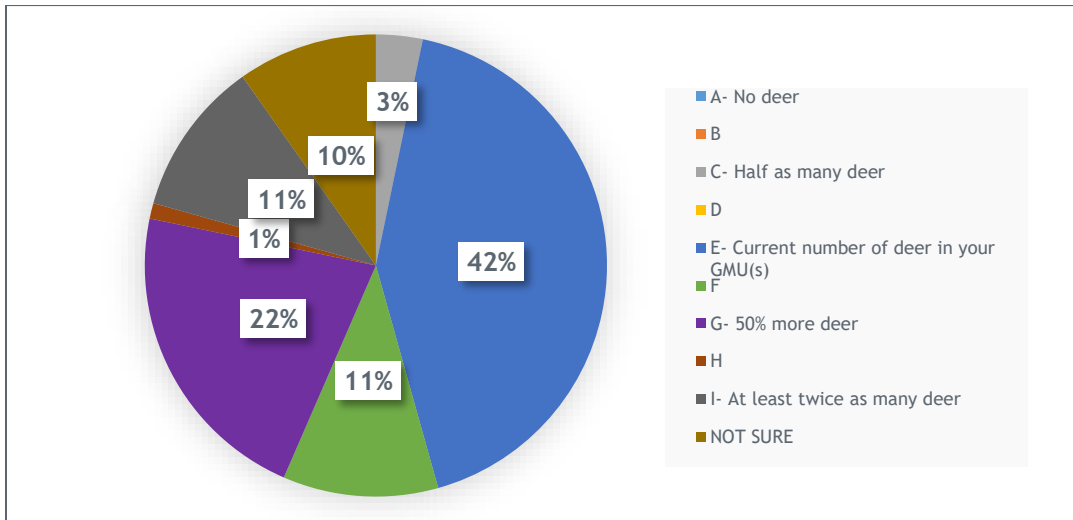
4. **DEER POPULATION:** An increase in deer numbers may result in an increase in damage caused by deer and will mean that more hunting licenses will need to be issued to manage deer numbers. Conversely, a reduction in deer numbers will ultimately result in fewer deer hunting licenses and more difficulty drawing deer hunting licenses. The letter E below represents the number of mule deer and/or white-tailed deer in the area(s) where you hunt. **Select a letter (A through I) to indicate the number of deer you would like to see in the area you hunt.** (only consider GMUs shown on pg. 2)

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>				
no deer		Half as many deer		Current number of deer in your GMU(s)		50% more deer		At least twice as many deer				
Fewer deer									More deer			

Circle one letter below for your reasonable goal or check the statement below the letters.

A B C D E F G H I

OR  I AM NOT SURE HOW MANY DEER WOULD BE A REASONABLE GOAL.



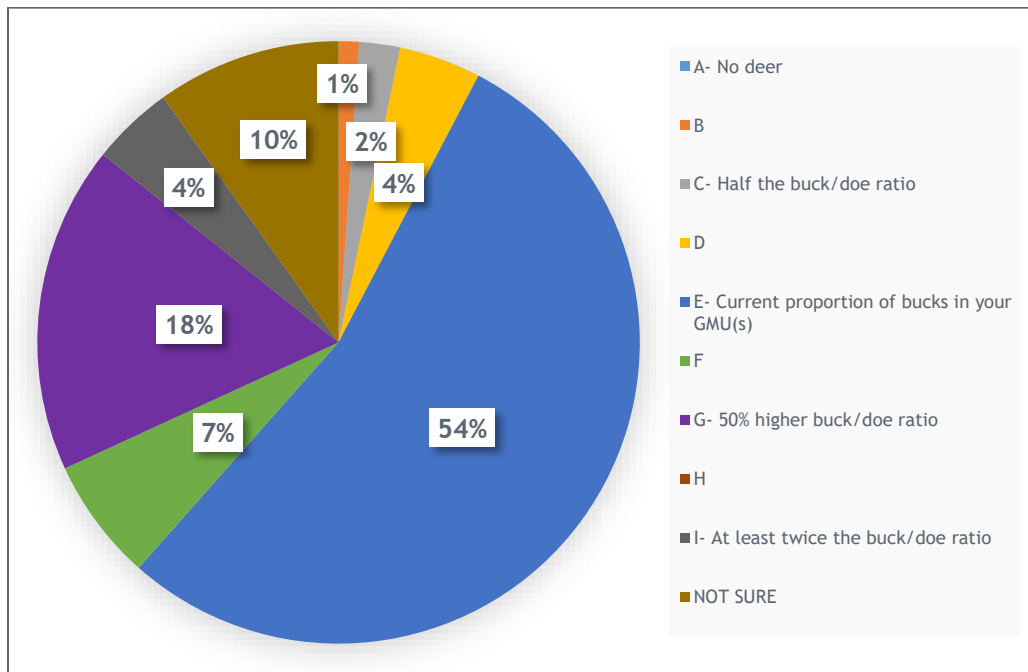
**5. BUCK/DOE RATIO:** The buck/doe ratio is the proportion of bucks relative to does in the deer population. In general, an increase in the buck/doe ratio may require a decrease in the number of buck hunting licenses, which could make buck licenses more difficult to draw. Conversely, a decrease in the buck/doe ratio may require an increase in buck hunting licenses, which could make buck licenses easier to draw. Also, a decrease in the buck/doe ratio is likely to result in lower CWD prevalence in the population, which would likely result in a healthier and more sustainable deer population. **Select a letter (A through I) to indicate the buck/doe ratio you think would be a reasonable goal to work towards for the deer population in the Southeast Colorado GMU(s) that you hunt.**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>
no deer		Half the buck/doe ratio		Current proportion of bucks in your GMU(s)		50% higher buck/doe ratio		At least twice the buck/doe ratio
Fewer bucks				More bucks				

Circle one letter below for your reasonable goal or check the statement below the letters.

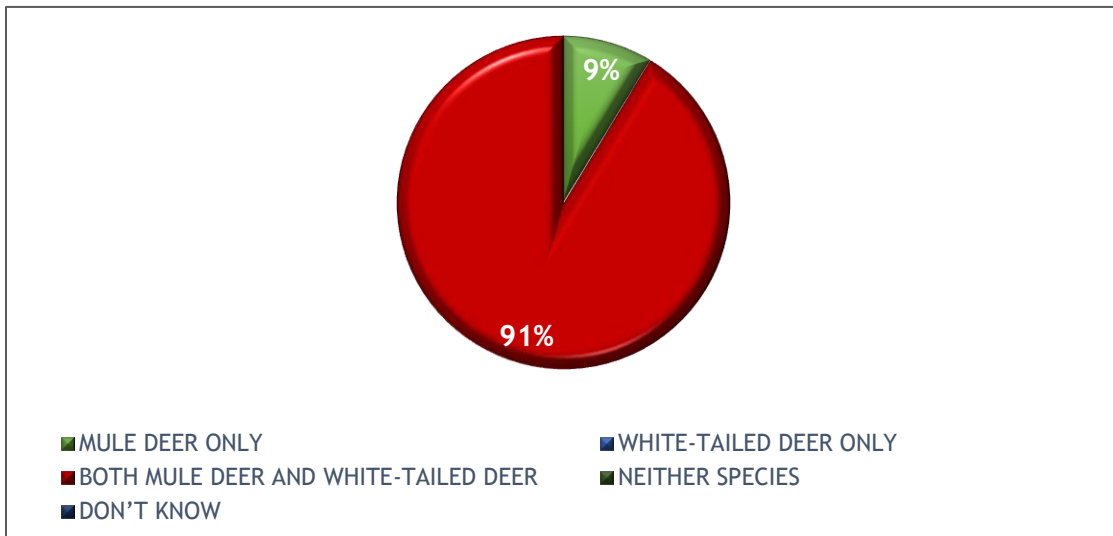
**A B C D E F G H I**

**OR**  I AM NOT SURE WHAT BUCK/DOE RATIO ON MY LAND WOULD BE A REASONABLE GOAL.



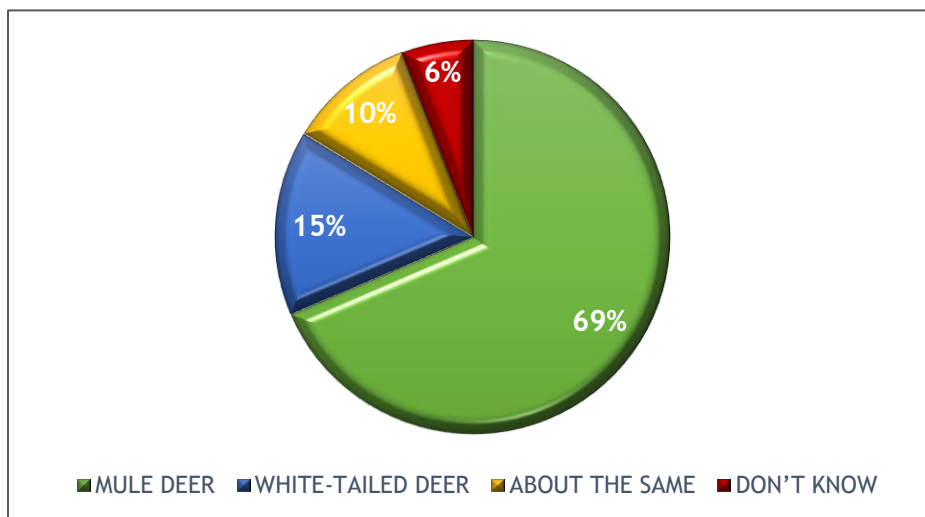
6. Which species of deer use the land where you hunt?

- MULE DEER ONLY
- WHITE-TAILED DEER ONLY
- BOTH MULE AND WHITE-TAILED DEER
- NEITHER SPECIES
- DON'T KNOW



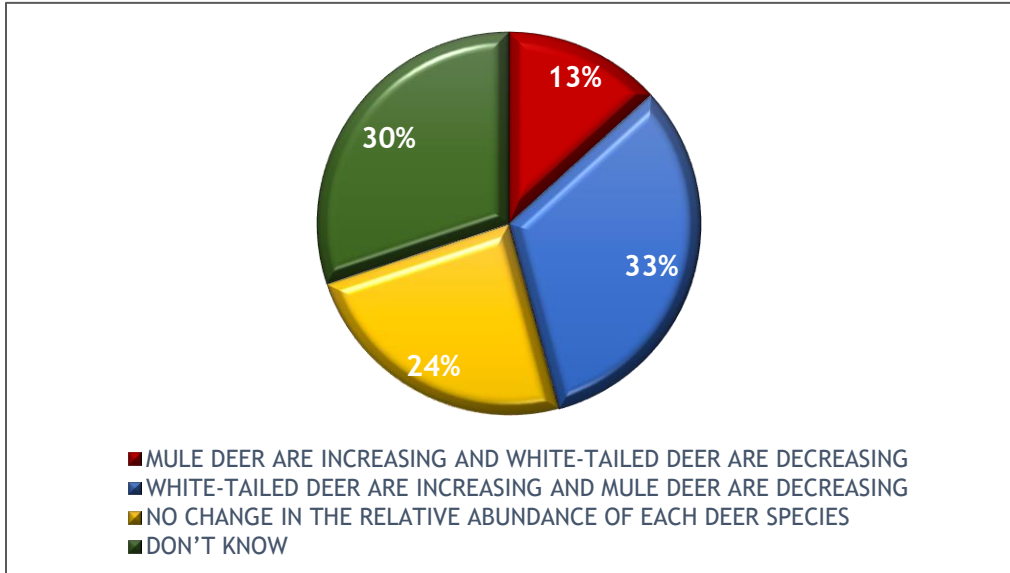
7. If both mule and white-tailed deer use the area, which species is most abundant? (leave blank if only one species is found in your hunting area)

- MULE DEER
- WHITE-TAILED DEER
- ABOUT THE SAME (50:50)
- DON'T KNOW



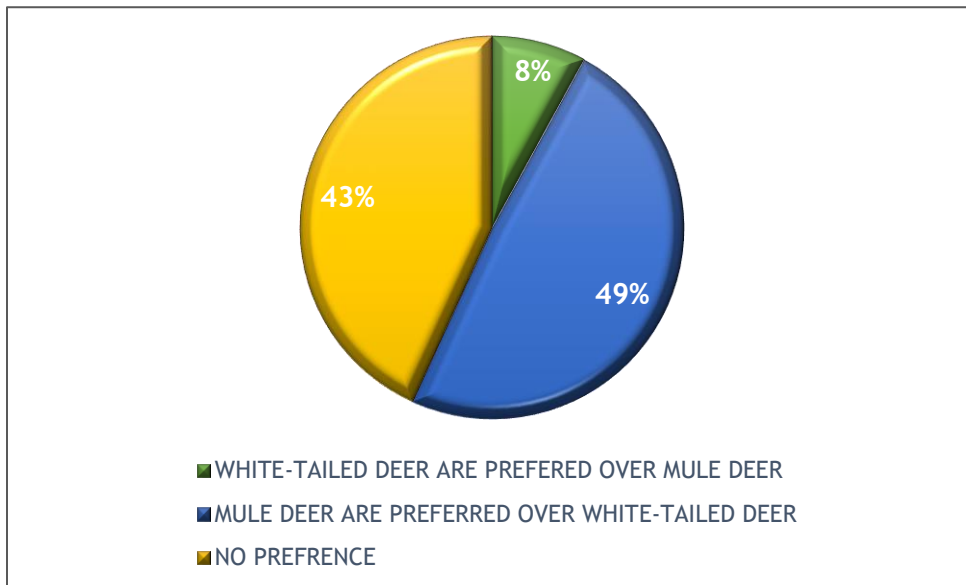
8. If both mule and white-tailed deer use your hunting area, has the relative abundance of each species changed in the last 10 years? (leave blank if only one species is found in your hunting area)

- MULE DEER ARE INCREASING and WHITE-TAILED DEER ARE DECREASING
- WHITE-TAILED DEER ARE INCREASING and MULE DEER ARE DECREASING
- NO CHANGE IN THE RELATIVE ABUNDANCE OF EACH DEER SPECIES
- DON'T KNOW



9. Do you have a preference for one deer species over another?

- WHITE-TAILED DEER ARE PREFERRED OVER MULE DEER
- MULE DEER ARE PREFERRED OVER WHITE-TAILED DEER
- NO PREFERENCE

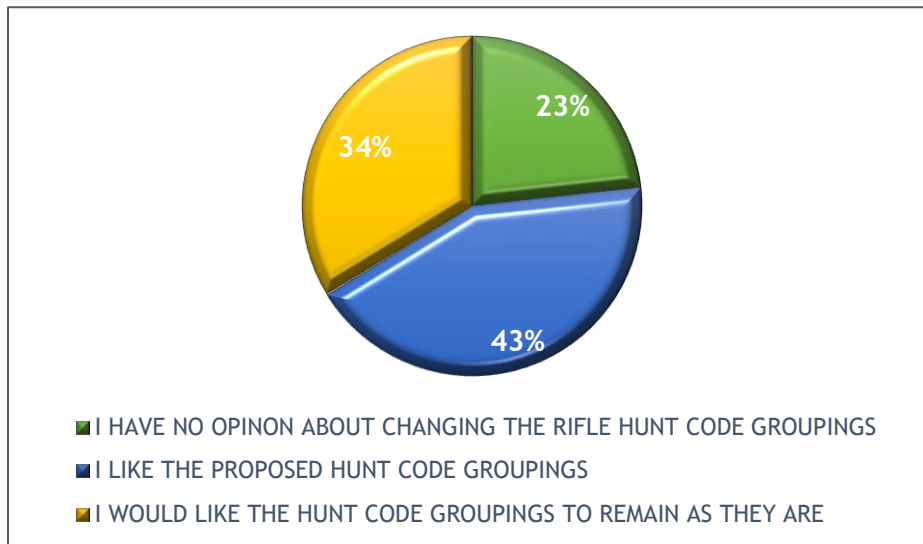


10. CPW often combines Game Management Units into **hunt code groupings**. This gives a deer hunter the ability to hunt any GMU within the hunt code grouping listed on their license. CPW is considering changing the RIFLE hunt code groupings for the GMUs shown on pg. 2. This would reduce complexity for hunters and CPW staff, offer more opportunity to hunters, and reduce the number of private properties split into more than one hunt code grouping. This would also improve population management by combining GMUs with shared and/or similar habitats. The proposed hunt code groupings would likely result in minor changes to the probability of drawing licenses for specific areas. The proposed hunt code groupings for the RIFLE SEASONS are listed here:

- GMUs 122, 127, and 132
- GMUs 126 and 146
- GMUs 125 and 130
- GMUs 137, 138, 143, and 144
- GMUs 139 and 145

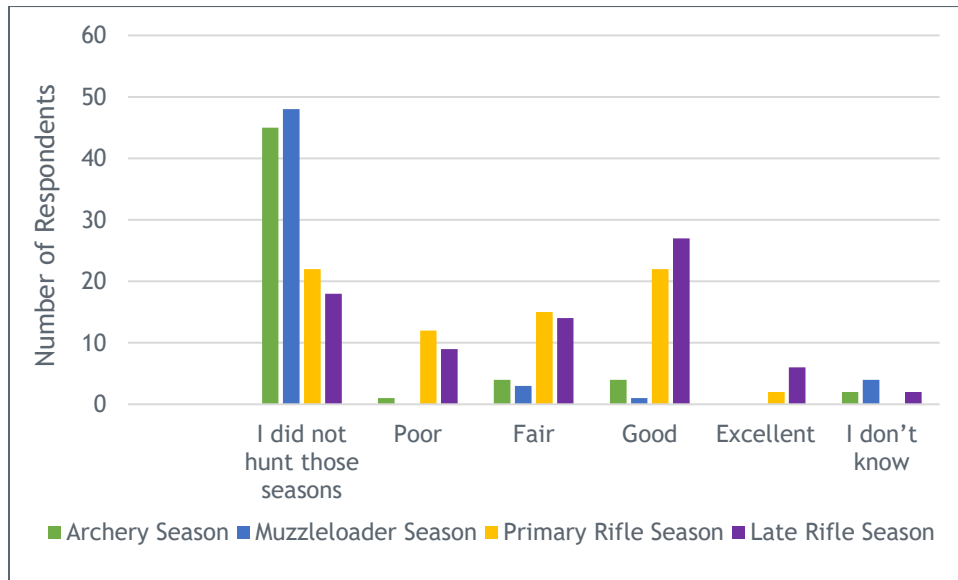
**Select the option that best describes your opinion regarding the proposed changes to hunt code groupings.**

- I HAVE NO OPINION ABOUT CHANGING THE RIFLE HUNT CODE GROUPINGS
- I LIKE THE PROPOSED HUNT CODE GROUPINGS
- I WOULD LIKE THE HUNT CODE GROUPINGS TO REMAIN AS THEY CURRENTLY ARE



11. How would you rate the **quality of deer hunting** in the GMU(s) you hunted from 2018-2020? (specific to GMUs on pg. 2; Please check only one response per season.)

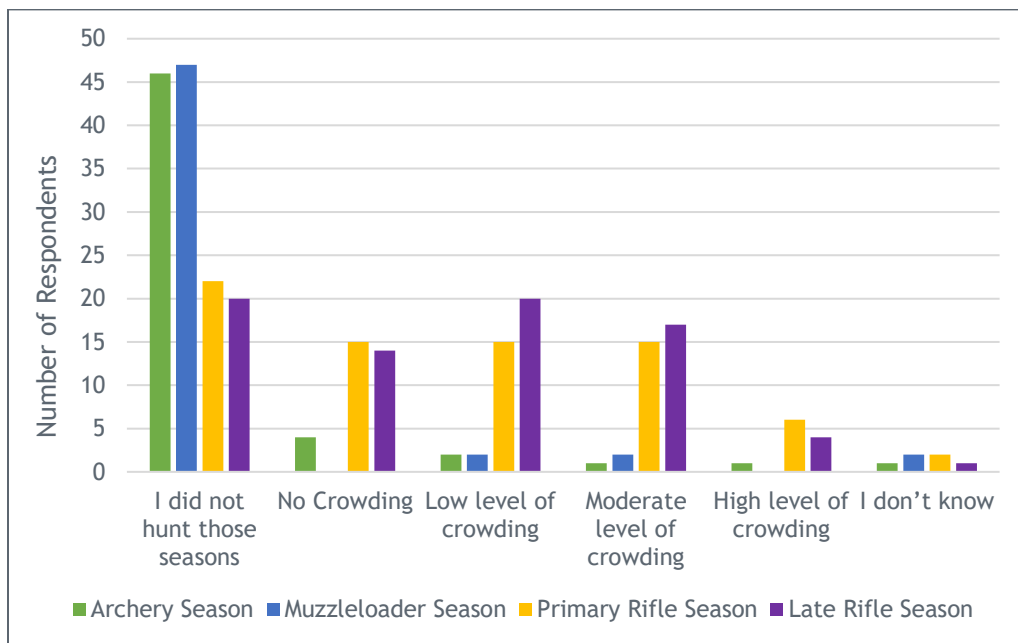
	I did not hunt those seasons	Poor	Fair	Good	Excellent	I don't know
Archery Season	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Muzzleloader Season	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Primary Rifle Season (Oct-Nov)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Late Rifle Season (december)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>





12. How would you rate the level of hunter crowding in the GMU(s) you hunted from 2018-2020? (specific to GMUs on pg. 2; Please check only one response per season.)

	I did not hunt those seasons	No Crowding	Low level of crowding	Moderate level of crowding	High level of Crowding	I don't know
Archery Season	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Muzzleloader Season	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Primary Rifle Season (Oct-Nov)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Late Rifle Season (december)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**Thank you for completing this survey.**

If you have comments about deer hunting in Colorado, please write them on the back of this survey or email them to: [jonathan.reitz@state.co.us](mailto:jonathan.reitz@state.co.us)

Please return your survey in the envelope provided. If you misplaced your envelope, you can return the survey to: Jonathan Reitz, Colorado Parks and Wildlife, 2500 S. Main St., Lamar, CO 81052

## APPENDIX C: Press Release Requesting Input for 30 Day Comment Period

July 20, 2022

### **Public opinion sought as CPW updates goals for managing Southeast plains deer herds**

LAMAR, Colo. - Colorado Parks and Wildlife is seeking public input from area landowners and hunters on its plans for managing two deer herds in Southeast Colorado.

The call for public input comes as CPW is revising deer herd management plans for the Arkansas River and the Mesa de Maya deer herds. These plans will guide CPW's management for these herds over the next 10 years.

In preparation of the plans, CPW conducted extensive hunter and landowner surveys. Now, CPW is inviting input from all stakeholders in hopes of getting a wide sample of opinions to guide wildlife managers writing the plans.

The herd management plans to be revised include 14 Game Management Units, or GMUs, including 122, 125, 126, 127, 129, 130, 132, 137, 138, 139, 143, 144, 145 and 146. These units are located in Cheyenne, Kiowa, Crowley, Otero, Bent, Pueblo, Prowers, Baca and Las Animas counties.

“Landowners, wildlife enthusiasts, and hunters who are interested in deer management in this area are encouraged to review the management plan drafts and let us know what you think,” said Jonathan Reitz, wildlife biologist.

Drafts of the plan can be found on the Colorado Parks and Wildlife website. Just type “herd management plans” in the search box.

There are several options for anyone who would like to provide feedback. They can drop by the CPW Service Center in Lamar or call at 719-336-6600.

Or they can call Wildlife Biologist Jonathan Reitz at 719-691-9130.

The purpose of a herd management plan is to integrate CPW's management strategies with concerns and ideas from interested publics to determine how a big game herd should be managed.

## APPENDIX D: Comments From 30 Day Comment Period

Comment #1:

I love the name. I read this one also - as it is more the mule deer area and seems like more our landscape of the ----- . Most of ----- are in GMU 146 - but we do have a few thousand acres in D33 - northwest of Pritchett.

So - I'll spare you my comments about lions again, but only say that if we want to keep CWD out of D33 - the lions might be our friends in doing so and we should stop suppressing their population :)

My other major issue would be with the lack of data. I understand the practical limitations and thus the recommended large population target range. My thought would be that in the absence of solid data we should manage as conservatively as possible. Thus, as we have had 2000-2600 deer for the last ten years and are currently at 2250 - these numbers should give us a "floor." I don't like 1800 for the low end of the population range as that seems like backsliding. However, all of these concerns could be in the margin of error of our data. Anyway, as you can predict again I'm in the "more deer" camp. What would be wrong with Alternative 2 - it seems both landowners and hunters said they'd like more deer. Maybe we should take advantage of the agreement and raise the population targets a bit. True, it doesn't look like doe harvest is having an impact (and that is what we control) - but still I like the aggressively increased population target in Alternative 2 - as that would then result in more conservative management and reduced license allocations correct? Basically, I just think if we can't use our regular computer model system - that one way to drive conservative management and lower harvest - is to set a high population target - so that future managers have to be conservative as they will be below the target. If they do reach the target that is a good result and both the landowners and hunters should be happy. Anyway, just a plug for the higher target in alternative 2 (or a request to at least set the floor at the current population or ten year average - somewhere between 2000-2600?). The agreement of landowners and hunters that they both want more deer is too good of an opportunity to waste :)

Thanks for doing all this work on these plans.

Cheers,

## APPENDIX E: Literature Cited

- Colorado Parks and Wildlife. 2018. Colorado Chronic Wasting Disease Response Plan. (Available online at [https://cpw.state.co.us/Documents/Commission/2018/Nov/Item\\_19-Chronic-Wasting-Disease-Response-Plan.pdf](https://cpw.state.co.us/Documents/Commission/2018/Nov/Item_19-Chronic-Wasting-Disease-Response-Plan.pdf))
- Miller, M.W., Wolfe, L.L., Sirochman, T.M., Sirochman, M.A., Jewell, J.E., Williams, E.S. 2012. Survival patterns in white-tailed and mule deer after oral inoculation with a standardized, conspecific prion dose. *Journal of Wildlife Diseases* 48: 526-529.
- Watkins, B. E. 2008. deer Model Templates. Colorado Division of Wildlife. Unpublished deer Modeling Guidelines.
- White, G. C., and B. C. Lubow. 2002. Fitting population models to multiple sources of observed data. *Journal of Wildlife Management* 66:300-309.