

# SANGRE DE CRISTO ELK HERD MANAGEMENT PLAN DATA ANALYSIS UNIT E-27

GAME MANAGEMENT UNITS

86, 691, 861

PREPARED FOR

COLORADO PARKS AND WILDLIFE



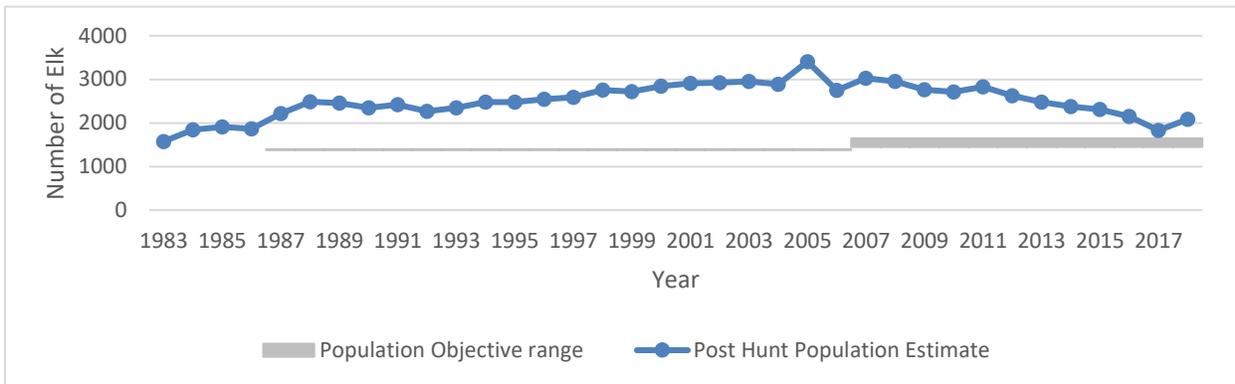
BY

ALLEN VITT  
BRIAN DREHER  
JULIE STIVER

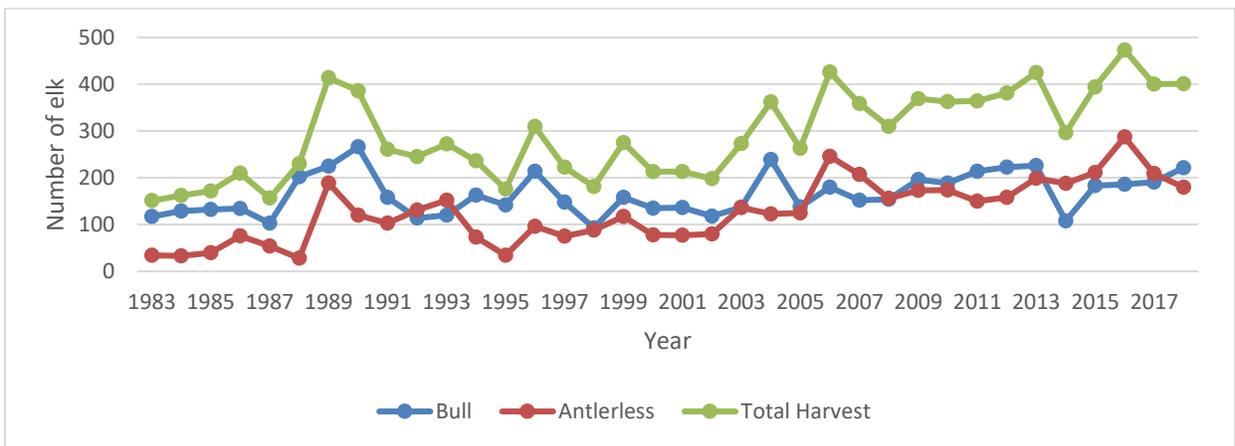
This plan was approved by the Colorado Parks and Wildlife Commission  
on  
January 15, 2020

## EXECUTIVE SUMMARY

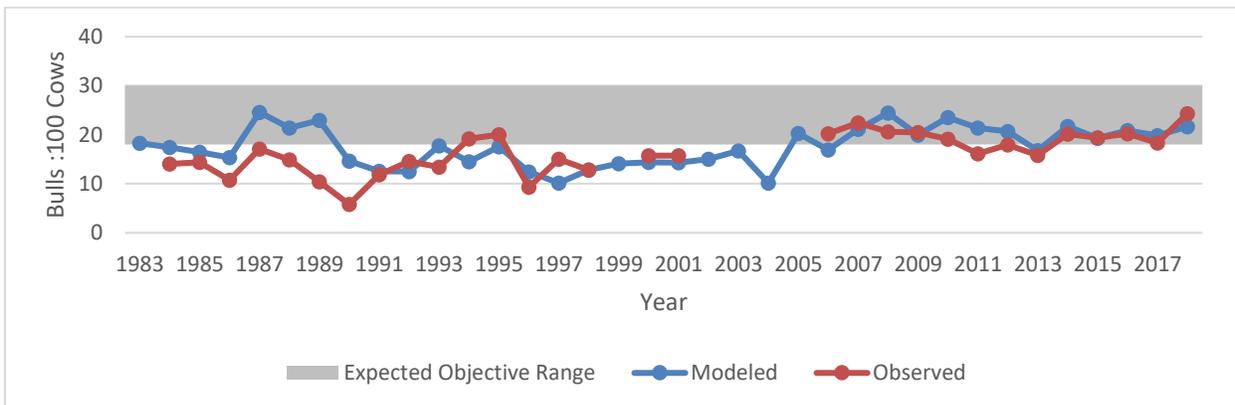
<b>Sangre de Cristo Elk Herd (DAU E-27)</b>	<b>GMUs: 86, 691, 861</b>
Posthunt Population: Previous Objective: 1,450-1,650 elk; Estimate for 2018: 2,100.	
<b>Current population objective: 1,800-2,200 elk</b>	
Posthunt Sex Ratio (Bulls:100 Cows): Expected posthunt sex ratio range: 18-30;	
Posthunt 2018 observed: 24; modeled: 22. Designated Unlimited Over-The Counter DAU	



**Figure 1.** Elk DAU E-27 DAU modeled posthunt population and objective range, 1983-2018.



**Figure 2.** Elk DAU E-27 harvest estimates, 1983-2018.



**Figure 3.** Elk DAU E-27 observed and modeled posthunt sex ratio (Bulls:100 Cows), 1983-2018.

## Background Information

The Sangre de Cristo elk Data Analysis Unit (DAU E-27), located in southcentral Colorado, covers 940 mi<sup>2</sup> ranging in elevation from 5,400 ft. to 14,345 ft. Elk generally occupy the area from grassland/shrub winter range adjacent to the foothills on the east side of the unit to above timberline on the western boundary. Over 50% (510 mi<sup>2</sup>) of the DAU is private ownership, including low density housing developments, agricultural properties, and large ranches. Hay is the primary crop produced on farmlands and cattle grazing occurs throughout the DAU.

Elk harvest management in the unit is two pronged. First, the unit is managed for hunter opportunity through unlimited Over-the-Counter (OTC) licenses in both the archery and regular rifle seasons. Second, elk harvest is managed to mitigate human-elk conflict, including game damage on agricultural fields. This is achieved with antlerless licenses in extended private-land-only (PLO) seasons and dispersal permits.

In developing this Herd Management Plan (HMP), Colorado Parks and Wildlife (CPW) sought input from stakeholders and staff on the desired population objective and to identify significant management issues. Despite game damage concerns on hay fields, landowners supported an increase in the population objective for the unit. This aligned with hunter feedback. Other issues identified included: 1) loss of habitat and restricted hunter access due to development, 2) hunter crowding, 3) forage competition with livestock, 4) noxious weeds and habitat changes due to lack of forest management, and 5) elk interchange between E-27 and E-11, the unit directly west of E-27.

## CPW Recommendation to the Colorado Parks and Wildlife Commission

Based on stakeholder feedback, CPW recommended an increase in the E-27 population objective to 1,800-2,200 elk, which encompasses the DAU's 2018 posthunt estimate (2,085 elk). The historic objective, 1,450-1,650 elk, was set in 2007 at a level thought necessary to mitigate human-elk conflicts and licenses were increased accordingly. Despite years of high harvest, the population has remained above the 2007 objective. However, game damage conflicts have generally been mitigated and landowner tolerance for the current population has increased as we have attempted to drive the population towards the objective.

## Strategies for Achieving Objectives and Addressing Management Issues

Since the elk population is currently within the objective range, the population can be maintained through current or slightly lower license numbers. Annually, license numbers will be reevaluated as new data becomes available.

CPW has limited ability to affect many of the issues identified through the plan's scoping process. However, we will seek opportunities to conserve land through fee title purchase or conservation easements, especially those with hunting access components. CPW will maintain the current extended PLO hunting season to disperse elk from private property and will continue to offer dispersal licenses for landowners experiencing elk conflicts. We will look for opportunities, working with land management agencies and private landowners, to improve habitat and increase hunter access. Finally, we will work collaboratively with partners to address elk management concerns between E-27 and E-11.

## TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	i
INTRODUCTION AND PURPOSE .....	1
COLORADO’S BIG GAME MANAGEMENT PROCESS .....	1
SANGRE DE CRISTO ELK DATA ANALYSIS UNIT .....	2
Location .....	2
Herd Management History .....	7
Game Damage .....	9
Harvest .....	9
ISSUES AND STRATEGIES .....	11
Public Involvement .....	11
Surveys .....	11
Issues Identified from Survey Results .....	13
Issues and Concerns .....	13
Alternative Development .....	16
Management Alternatives and Preferred Objectives.....	16
Herd Composition (Bull/Cow Ratio) .....	16
Population Objective .....	16
Public Comment Period .....	17
Outreach efforts .....	17
Strategies to Address Issues and Management Concerns.....	17
Strategies for Achieving Objectives.....	18
LITERATURE CITED .....	19
Appendix A: 2017 E-27 Hunter Questionnaire Results.....	20
Appendix B: 2017 Landowner Questionnaire Results .....	29
Appendix C: Sangre de Cristo HPP Letter of Support.....	37
Appendix D: Comments From 30 day comment period .....	39

## INTRODUCTION AND PURPOSE

Colorado Parks and Wildlife (CPW) manages big game for the use, benefit, and enjoyment of the people of the state in accordance with the CPW's Strategic Plan (2010-2020). Elk 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. The CPW uses a "Management by Objective" approach to manage the state's big game populations (Figure 4).

### COLORADO'S BIG GAME MANAGEMENT PROCESS

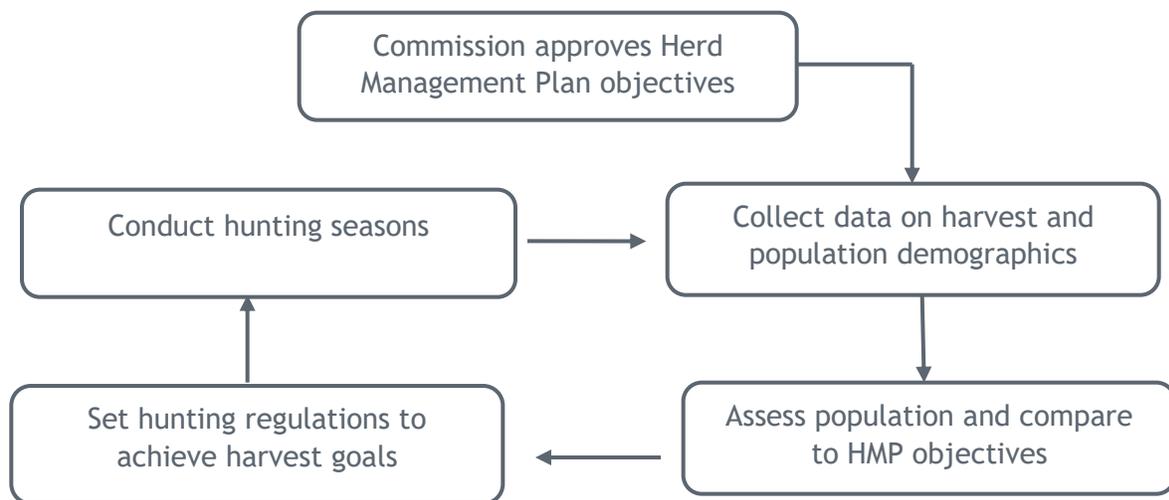


Figure 4. Management by Objective process used by Colorado Parks and Wildlife to manage big game populations by Data Analysis Unit (DAU).

With the Management by Objective approach, big game populations are managed to achieve population objectives established for a herd. The Herd Management Plan (HMP) for each herd incorporates the capability of the habitat to support big game populations, other social and biological limiting factors, and input from the public, organizations, and other agencies about their issues and concerns regarding hunting management and herd objectives. Each HMP is publicly approved by the Colorado Parks and Wildlife Commission. Annual harvest objectives and the resulting license recommendations for all hunts are designed to achieve the management objectives approved in the HMP. A Data Analysis Unit (DAU) is the geographic area and identifying number of a relatively discrete big game population. DAUs can contain multiple Game Management Units (GMUs) which are geographic areas delineated to distribute hunters using limited licenses. 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 interchange of animals between adjacent herds.

Management decisions within a herd are based on an HMP. The primary purpose of an HMP is to establish population and sex ratio (i.e., the number of males per 100 females) objectives for the herd. The HMP 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 the CPW staff and the PWC. The intentions of the 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 the HMP, agency personnel attempt to balance the biological capabilities of the herd and its habitat with the public's demand for wildlife recreational opportunities. HMPs are approved by the PWC and are reviewed and updated approximately every 10 years.

The HMP serves as the basis for the annual herd management cycle. In this cycle, the size and composition of the herd is assessed and compared to the objectives defined in the HMP and 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, translocation plans are made). Hunting seasons and/or translocations are then conducted and evaluated. The annual management cycle then begins again (Figure 4).

The purpose of this HMP is to set a population objective for the Sangre de Cristo elk herd (E-27). The HMP plan will be in place from 2019-2029 with the expectation that it will be reviewed and updated in 2029.

## **SANGRE DE CRISTO ELK DATA ANALYSIS UNIT**

### **LOCATION**

The Sangre de Cristo Elk herd management area is located in south-central Colorado and lies within portions of Fremont, Custer and Huerfano Counties (Figure 5). It consists of Game Management Units (GMU's) 86, 691 and 861. The DAU is bounded on the north by US Highway 50 and the Arkansas River; on the east by Colorado Highway 69, Huerfano County Road #555 (Muddy Creek Road) and Huerfano County Roads #570 and 572 (Pass Creek Road); and on the south and west by the Sangre de Cristo divide and Highway 285.

E-27 covers 940 mi<sup>2</sup> ranging in elevation from 5,400 ft where Grape Creek flows into the Arkansas River to 14,345 ft at the summit of Mount Blanca. Topography ranges from flat hay meadows to gentle slopes, rolling hills to steep ridges and gulches to cliffs and alpine meadows. Precipitation is mainly in the form of winter snows and spring and summer rains. Alpine areas average 20+ in of moisture a year and lower elevations 6-10 in. Predominate biotic communities are: alpine tundra, sub-alpine conifer, montane conifer, montane shrub and mountain meadow. Elk are found in all of these communities but are most common in sub-alpine conifer, montane conifer and montane shrub.

Major drainages in E-27 include: Arkansas River, Hayden Creek, Texas Creek, Grape Creek, and the Huerfano River.

Landownership in E-27 includes the following: Colorado Parks and Wildlife 4 mi<sup>2</sup> (0.4%), State Land Board 26 mi<sup>2</sup> (2.7%), Bureau of Land Management 165 mi<sup>2</sup> (17.5%), United States Forest Service 235 mi<sup>2</sup> (25%) and 510 mi<sup>2</sup> (54.3%) under private ownership (Figure 6). CPW currently possesses the recreational lease on 5,230 acres of State Land Board property in E-27. These leased properties include Beddows Mountain (500 acres), Froze Creek (640 acres), Pinnacle Rock (520 acres), Grape Creek (≈1,010 acres), Short Creek Baldy (640 acres), Cody Park (640 acres), Turkey Gulch (640 acres) and McCoy Gulch (640 acres). A total of 413 mi<sup>2</sup> (44%) are open to public hunting in E-27 (Figure 6).

Approximately 80% of E-27 (752 mi<sup>2</sup>) is classified as elk habitat (Figure 7). Elk generally occupy the area from the grassland/shrub winter range adjacent to the foothills to above timberline on the alpine during the summer months. Elk move downslope from west to east onto winter range with increasing snow cover and decreasing forage availability. Studies from other elk populations have shown that hunting pressure may also influence timing of movement onto winter range (Vieira et al. 2003; Mikle et al. 2019). Therefore, the timing of elk migration in E-27 could be influenced by hunting seasons. This seasonal migration generally begins in September and continues until January. Winter range is found on windblown south and east facing slopes with exposed forage. Wintering concentrations of elk occur in the foothills along the southern end of GMU 861 near Mosca Pass and Medano Pass and the northern foothills of GMU 86 near Hillside, Colorado (Figure 7). Migration back to summer range follows green up with elk dispersing to the overall range of the DAU in summer and fall.

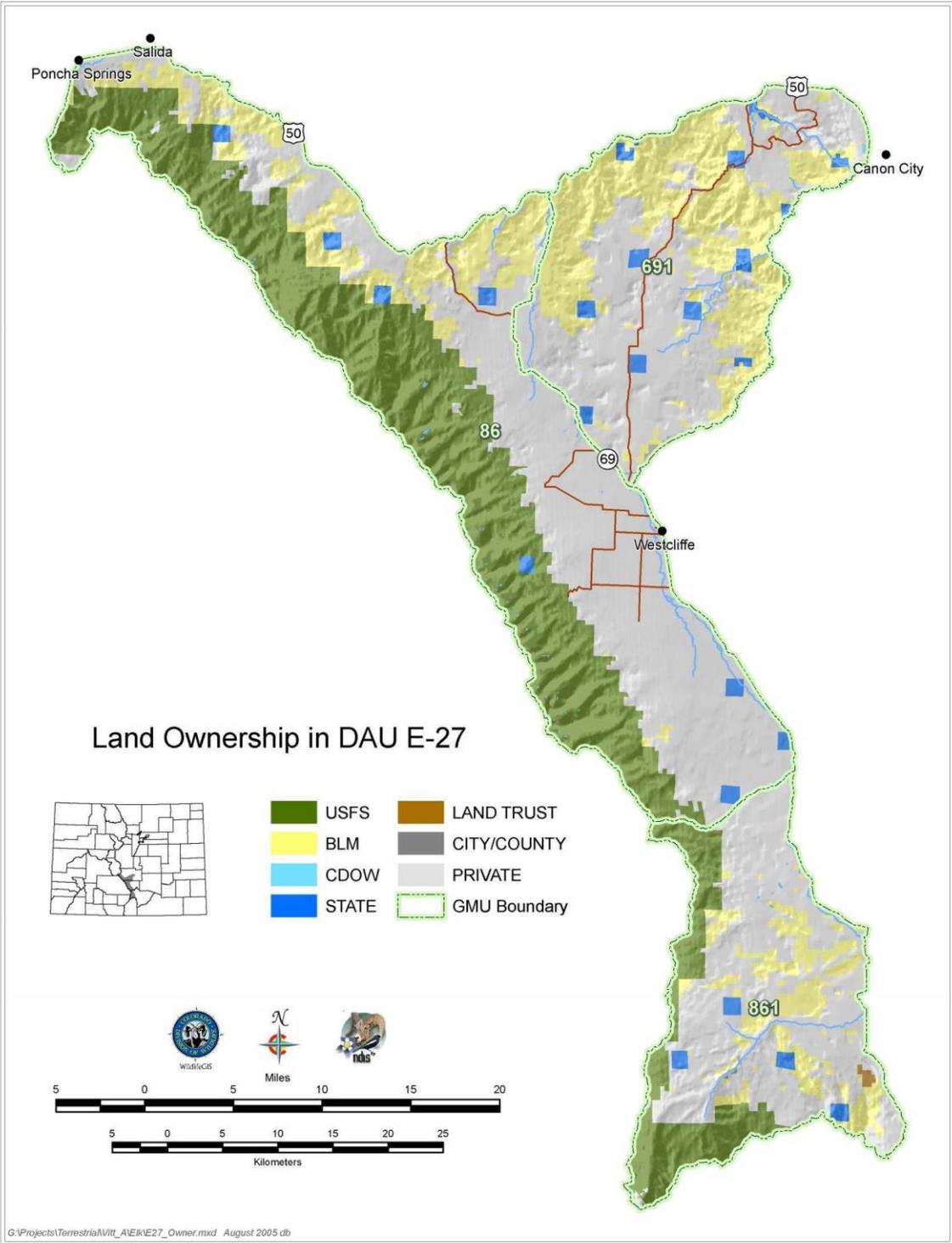


Figure 5. Land Ownership in DAU E-27

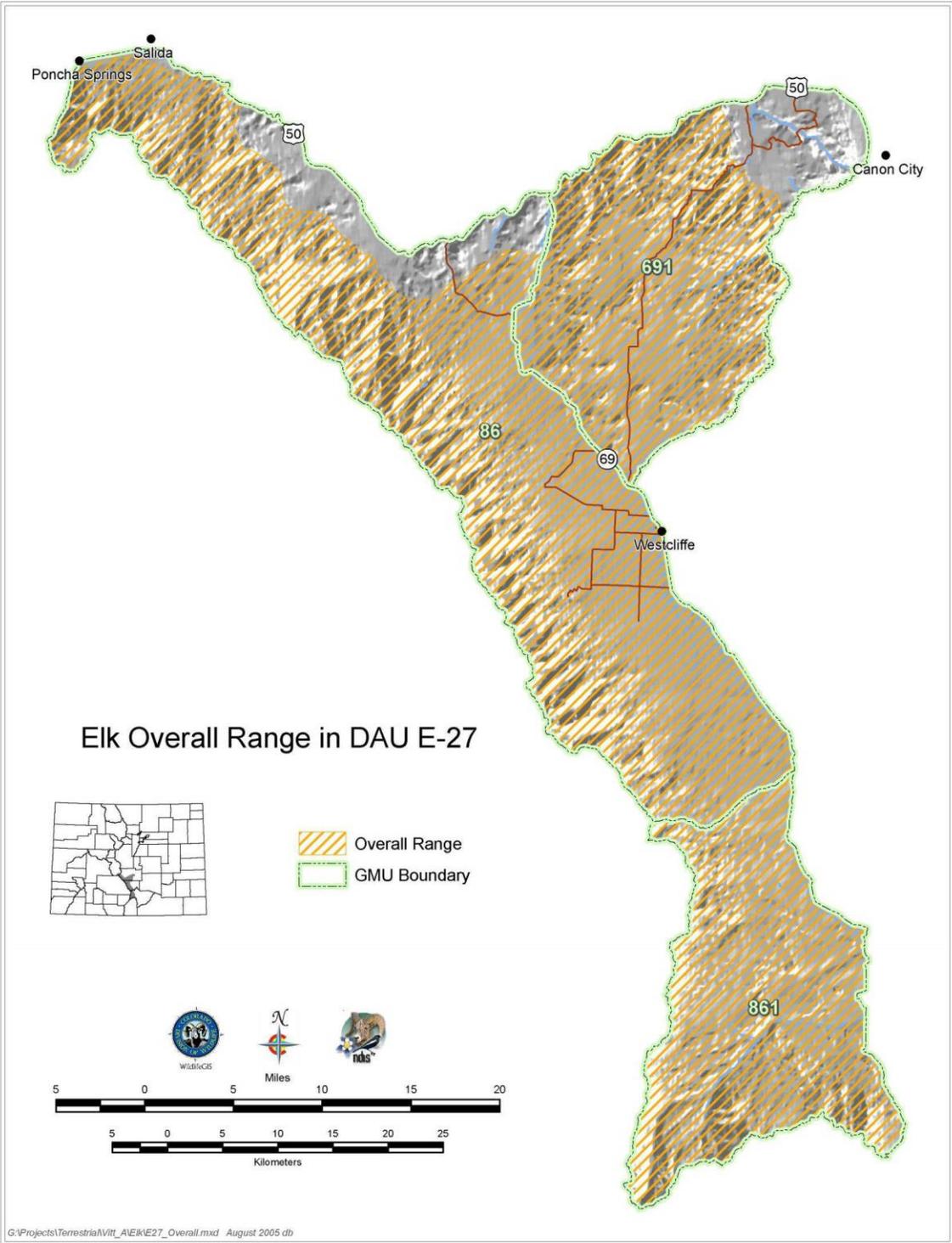


Figure 6. Elk Overall range in DAU E-27

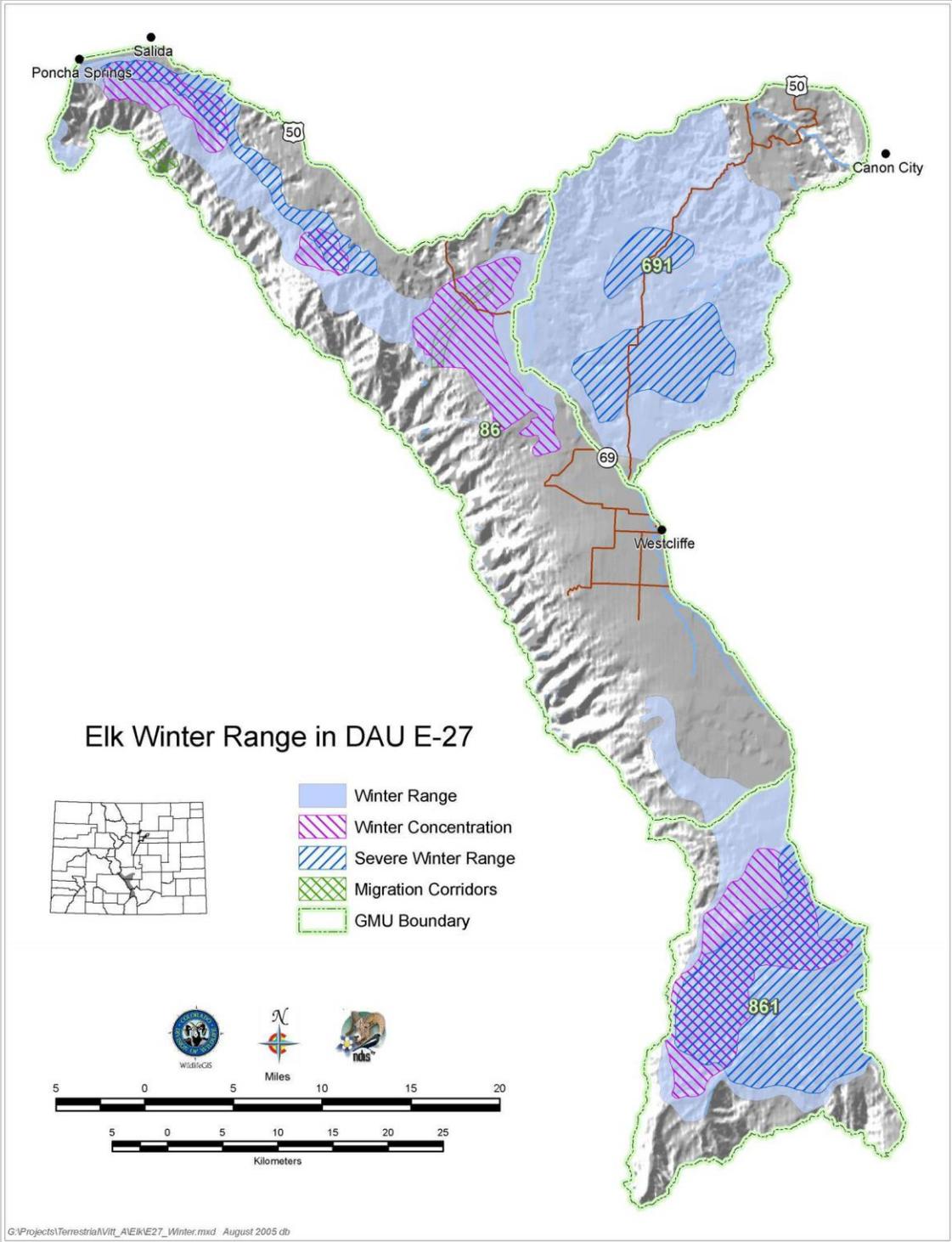
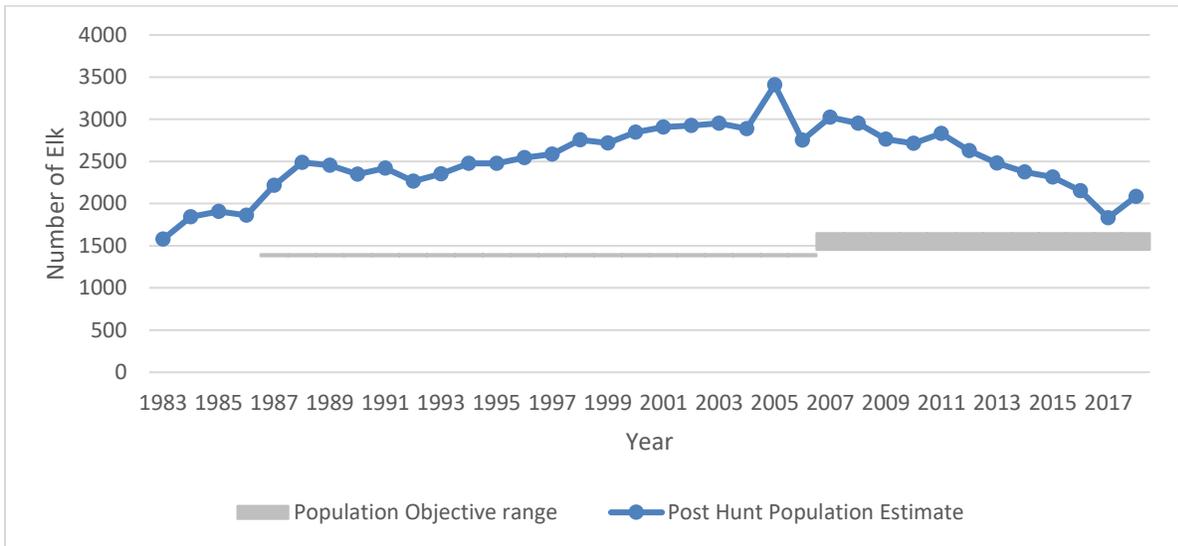


Figure 7. Elk Winter range in DAU E-27

**HERD MANAGEMENT HISTORY**

Prior to 2005, the population objective for E-27 was 1,400 elk. In 2005, we increased the objective to 1,450-1,650 elk. Elk numbers in the Sangre de Cristo herd increased from about 1,300 in 1980 to an estimated high of 3,400 in 2005. The population has been over the herd objective since 1982. The 2018 post-season population estimate for the Sangre de Cristo herd was approximately 2,085 elk (Figure 8). Although the estimate is above the long-term objective of 1,450-1,650 elk, the estimated herd size has decreased since its high in 2005.



**Figure 8.** Elk DAU E-27 DAU modeled posthunt population and objective range, 1983-2018.

Aerial surveys for E-27 are available from 1983 to present. Initially, we conducted surveys sporadically, depending on funding. Starting in 2006, we increased survey efforts in E-27 and data collection has remained consistent since that time. These surveys, conducted by helicopter, sample only a portion of the existing post-hunt population. We present results as the number of elk observed, bulls:100 cows and calves:100 cows. Males are divided into yearling, two year old and mature bulls. We underestimate bull:cow ratios because, at the time of survey, bulls are isolated from large groupings of cows and calves and therefore tend to be underrepresented. However, calf:cow ratios are more precise because they are in large groups. Aerial surveys are subject to variability due to weather, snow cover, sample size and observers.

Between 1983-2018, the average calf:cow ratio observed in E-27 was 44 calves:100 cows, with a high of 62 in 1984 and a low of 20 in 2018 (Figure 9). During the same time period the observed bull:cow ratio averaged 16 bulls per 100 cows, with a low of 6 in 1990 and 2004, to a high of 34 in 1999 (Figure 10). The observed bull:cow ratio for 2018 was 24 bulls per 100 cows.

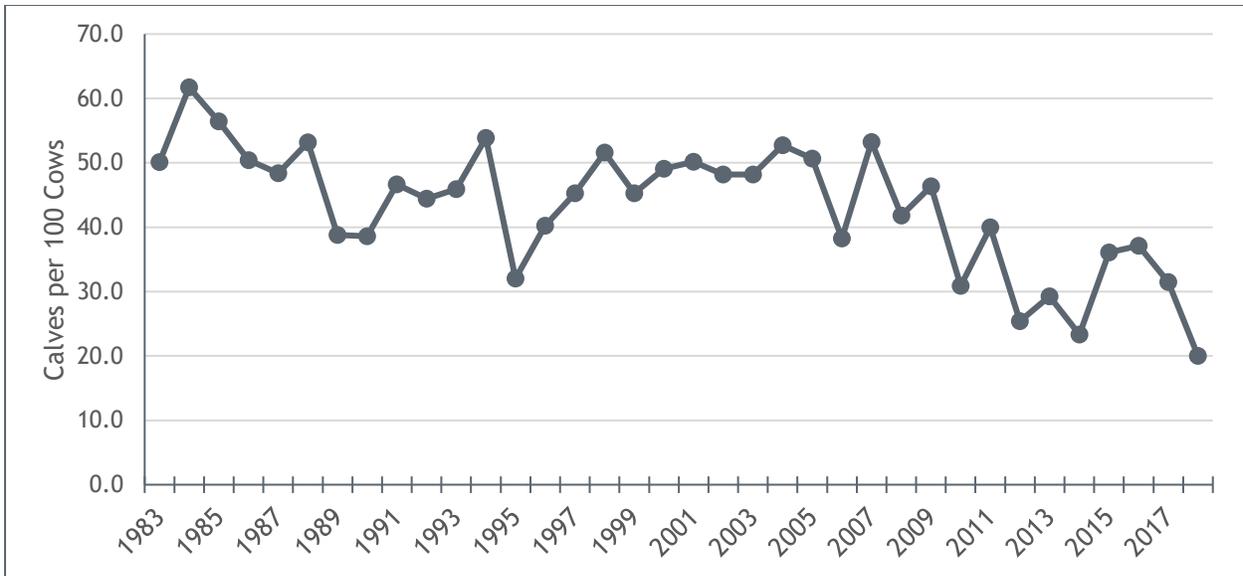


Figure 9. E-27 Calves:100 cows, 1983-2018.

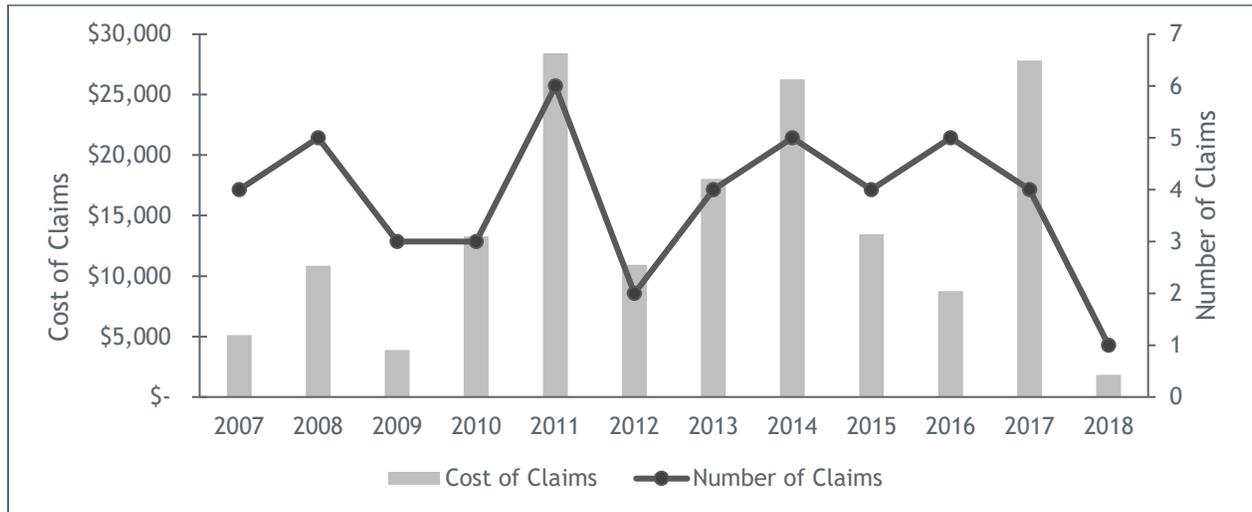


Figure 10. E-27 Post-hunt Bulls:100 Cows, 1983-2018.

E-27 has been managed for unlimited over the counter bull hunting for as long as our records exist. The unit has had a 4-point antler restriction since initiation in 1986. There has been some level of antlerless harvest since the early 1970's. In 2015, CPW staff requested that rifle and muzzleloader season antlered licenses be converted to either-sex licenses. The intent of this change was to increase cow harvest on public lands in the early season prior to the elk migrating down onto private lands.

**GAME DAMAGE**

Since 2007, CPW has paid a total of \$168,657.18 for 46 elk game damage claims in E-27 (Figure 11). Two of the claims, totaling \$727.37, were for harvested crops while the remaining 44 claims were for growing crops. The crops include hay, alfalfa, and grass/alfalfa mixes.



**Figure 11.** Total cost and total number of game damage claims by year for elk DAU E-27, 2007-2018.

**HARVEST**

Harvest from 1983 to 2018 ranged from a low of 151 in 1983, to a high of 473 elk in 2016 (Figure 12). The population has been over objective since 2007 so we have increased license numbers with a resulting increase in harvest. The number of hunters per year for all seasons between 2007 and 2018 ranged from a low of 2,007 in 2008 to a high of 3,271 in 2018 (Figure 13). However, with the increase in licenses, hunter success rates have declined (Figure 14).

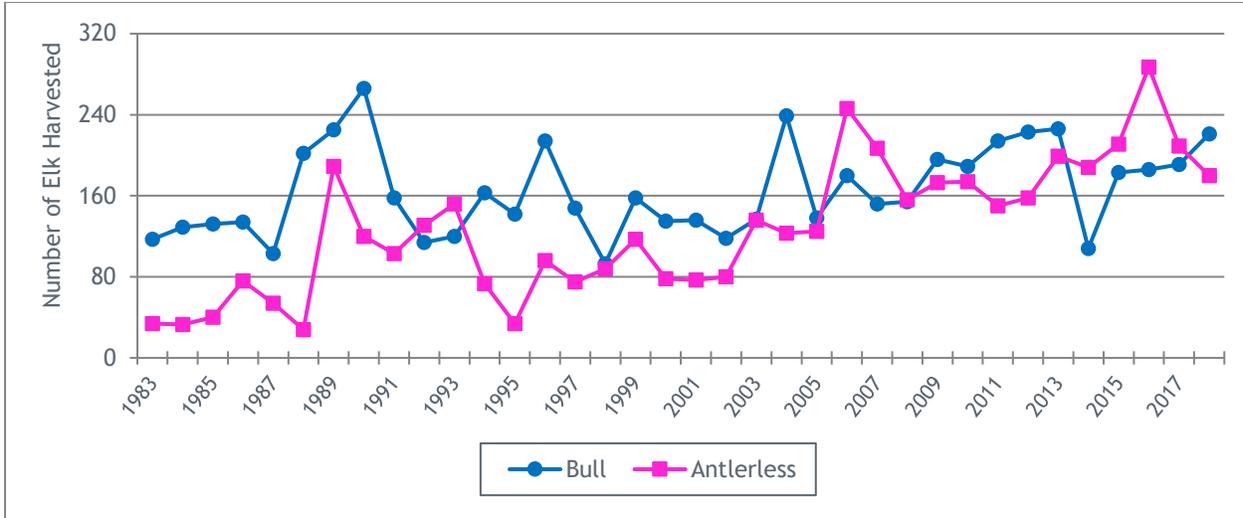


Figure 12. Elk DAU E-27 elk harvest, 1983-2018.

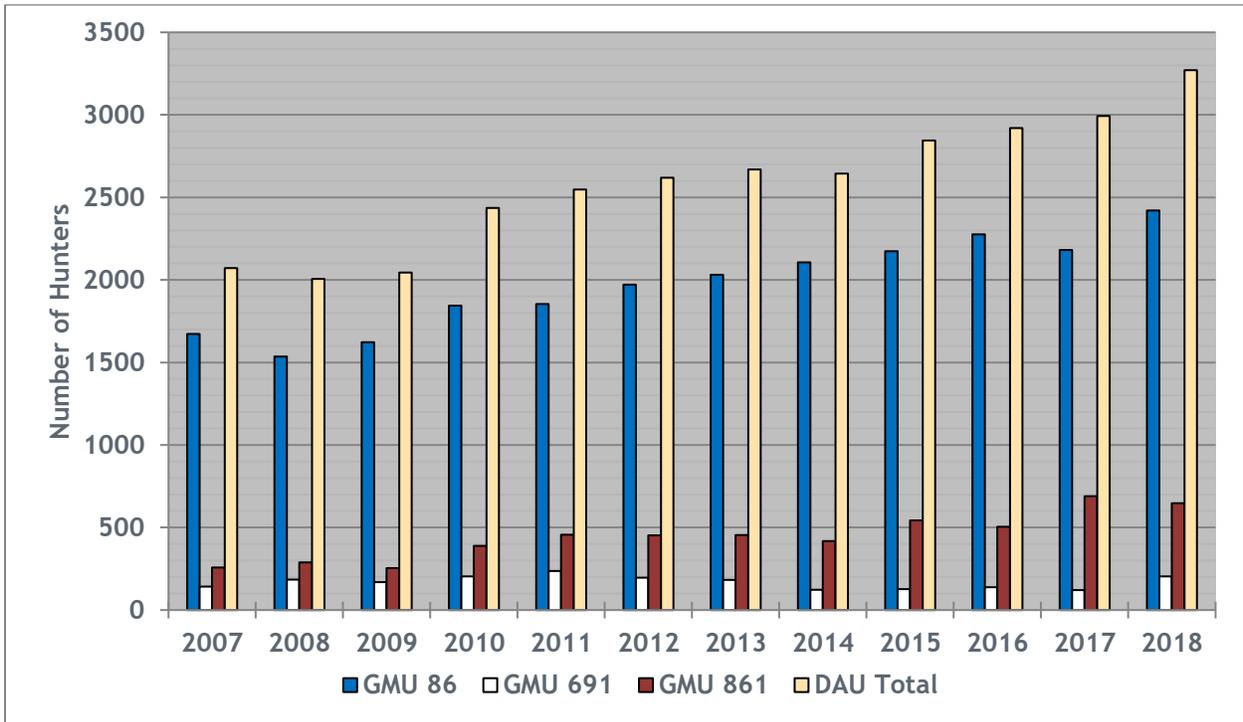
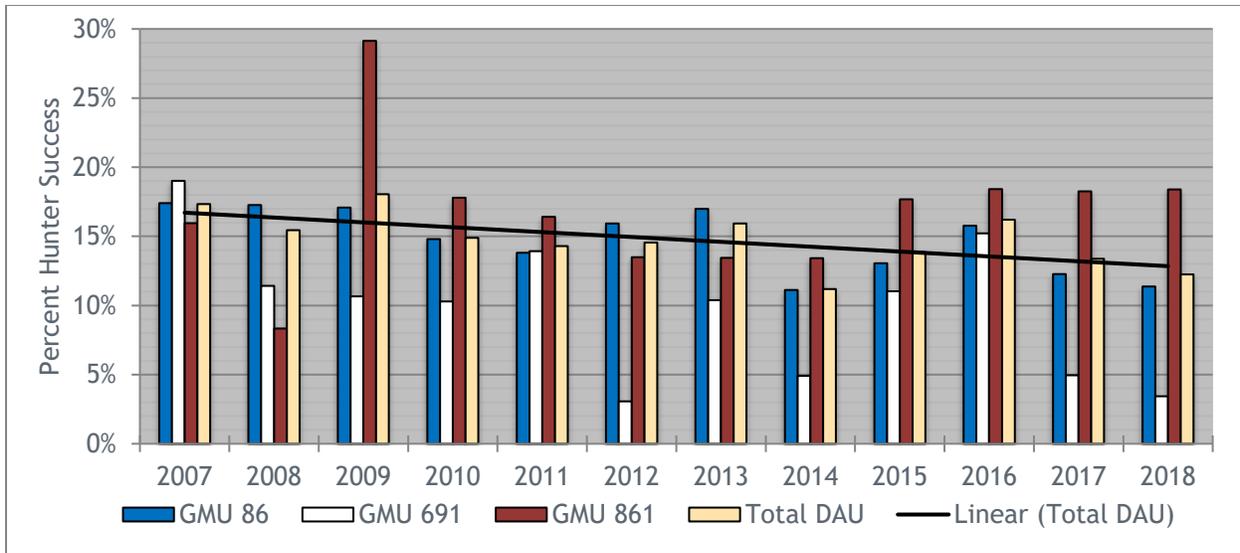


Figure 13. Total number of estimated hunters by GMU and DAU for elk DAU E-27, 2007-2018.



**Figure 14.** Percentage hunter success for all manners of take by GMU and DAU for elk DAU E-27, 2005-2018. Hunter success is defined as the total number of elk harvested divided by the total number of hunters.

## ISSUES AND STRATEGIES

In developing this draft plan, we identified issues through both stakeholder and staff involvement. Stakeholders included hunters, landowners, and the local Habitat Partnership Program (HPP) committee.

### PUBLIC INVOLVEMENT

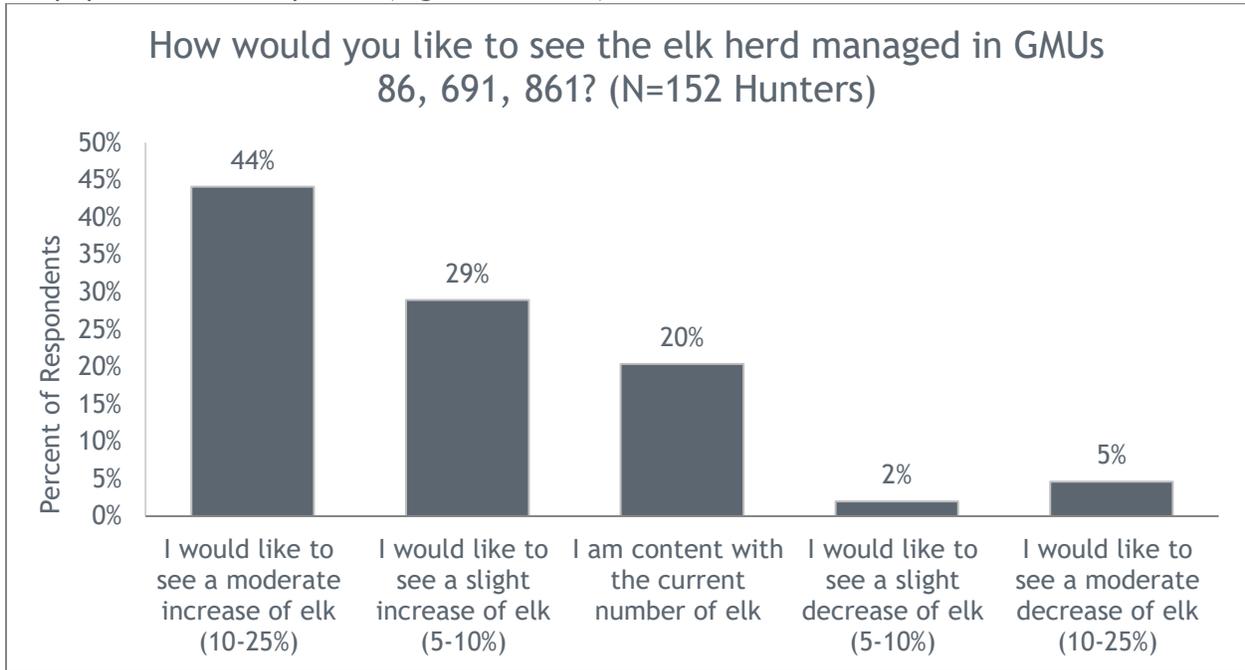
#### *Surveys*

CPW staff considered results from three public input surveys and one public meeting for the development of this draft plan. Hunters were surveyed through either internet or mail-in surveys while landowners were mailed surveys which included return envelopes with pre-paid postage.

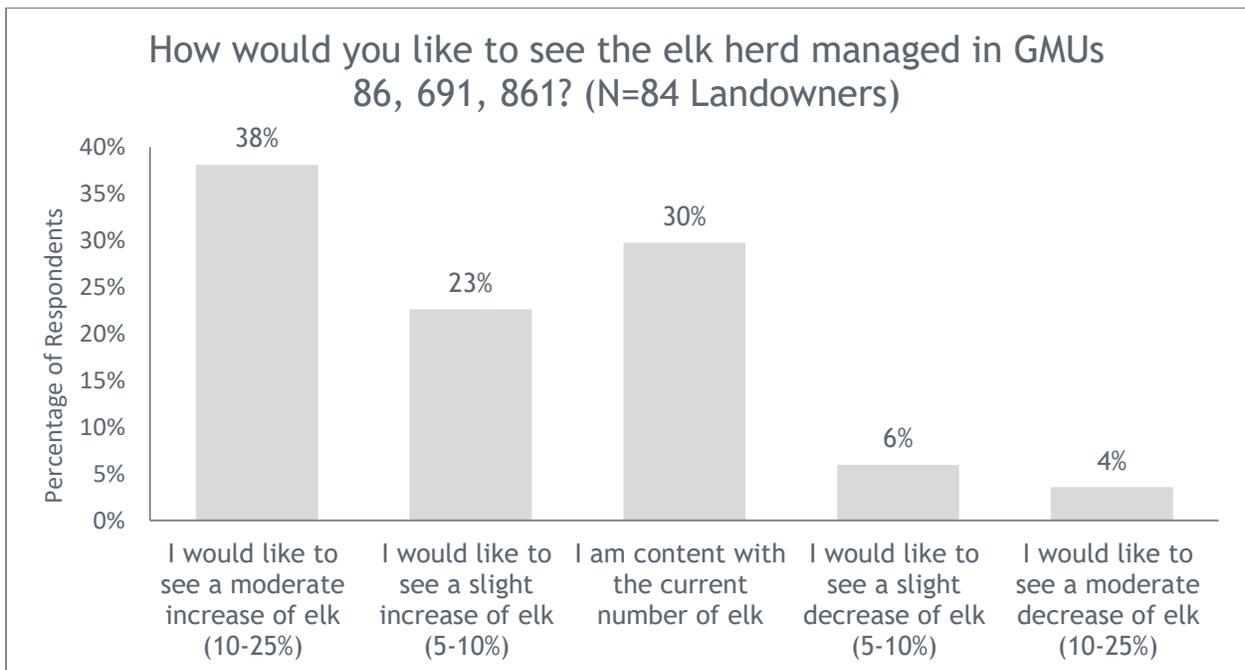
We sampled 896 hunters that had applied for or received licenses in 2015 and 2016. Individuals were randomly selected to either receive a postcard with a link to the online survey or a mail-in survey with a pre-paid postage return envelope. We received 155 responses. A summary of the results of all the hunter questionnaires are in Appendix A.

To solicit landowner input, we used county records to identify individuals with parcels >35 acres. From that list, we randomly selected 270 landowners and mailed them a survey booklet with a pre-paid return envelope. Eighty-six (86) landowners replied to the survey. A summary of the results of the landowner survey are found in Appendix B.

The majority of hunters and landowners supported an increase in the elk population objective for E-27, with 73% of hunters and 61% landowners indicating they would like to see a slight or moderate increase in elk. Thirty percentage (30%) of landowners indicated that the current elk population is acceptable (Figures 15 & 16).



**Figure 15.** Percentage of responses to the question asking hunters how they would like to see the elk herd managed in elk DAU E-27. See Appendix A.



**Figure 16.** Percentage of responses to the question asking landowners how they would like to see the elk herd managed in elk DAU E-27. See Appendix B.

*Issues Identified from Survey Results*

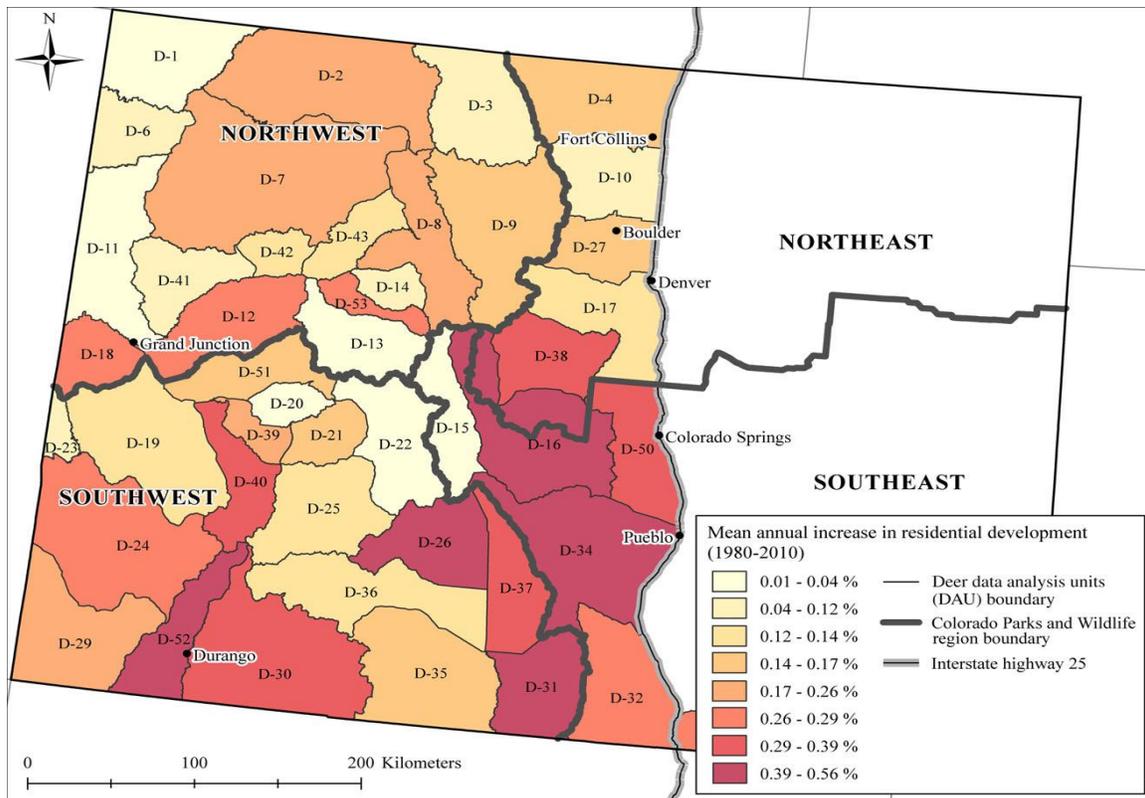
The top concerns for hunters were: 1) elk seeking refuge on private land, 2) elk population too low, 3) loss of habitat, 4) lack of hunting access, and 5) loss of habitat to an increasing population and development.

For the landowners, the top concerns were: 1) loss of habitat due to an increasing human population and development, 2) winter elk starvation, and 3) forage competition resulting in loss of revenue.

**ISSUES AND CONCERNS**

Based on the comments from survey respondents, the local HPP committee, and field staff, we consider these to be the most important issues when setting the new objectives.

1. Low-density housing development - During the last several decades low-density housing developments have reduced the available elk habitat in E-27 through direct habitat loss and indirect factors such as human presence, pets, fences and disturbance. A recent study of residential development from 1980-2010 (Johnson et al. 2016), showed that the area overlapping E-27 has some of the highest level of development in Colorado (refer to the area marked D-34 in Figure 17). Since the human population in Colorado is expected to double by 2050, this trend is expected to continue and will be a main area of concern for managers, both for trying to maintain elk populations and allowing population management through harvest on an increasingly developed landscape. Increased human activity in association and development related to this activity has contributed to an increased use of agricultural lands by elk, primarily in the northern end of the DAU from Hillside to Price Park, Sullivan Creek and Big Cottonwood Creek.
2. Elk taking refuge on private lands - This is becoming a greater problem throughout the west as large ranches are leased to outfitters, subdivided, or are owned by absentee landowners, reducing hunting opportunity. Elk are a highly intelligent and mobile animal that learn from past hunting activities. Often the migration to lower elevations begins during the archery season and becomes more pronounced as hunting seasons progress. CPW tries to encourage hunting on all private lands but does not have ultimate control. Agricultural producers in the Wet Mountain Valley own the more open valley floor where hayfields and pastures occur. Many of these lands adjoin National Forest property where public access is often limited. Hunting pressure on forest lands eventually move elk onto private property creating a temporary preserve situation effectively reducing hunting opportunity.



**Figure 17.** Map of deer data analysis units (DAUs) and regions in Colorado designated by Colorado Parks and Wildlife, and the percent increase in human population from 1980-2010 (Johnson et al. 2016). Elk DAU E-27 overlaps portions of Deer DAU D-34.

3. Hunter crowding and public access - Public access to National Forest land is limited by the number of access points to public lands because of difficulties obtaining permission to access public property through private lands. This increases the number of vehicles at trailheads and the number of hunters accessing the public lands from each one of the access points. Survey respondents indicated that this leads to hunter crowding.
4. Forage competition with livestock and damage to fences - Several landowners expressed concern over the competition between elk and cattle for forage on privately owned rangelands landowners. A few ranchers also commented about elk densities on public land summer ranges. Additionally, many of the large and small landowners complained about elk damage to fences.
5. Habitat changes related to forest management and invasive weeds - Several stakeholders, including the local HPP committee, commented on habitat changes due to fire suppression. Lack of fire has caused increased forest density and tree encroachment into historical meadow complexes. This has led to a decrease in the amount of forage and low elevation critical winter range.

Noxious weed invasions including cheat grass, various knapweeds, Chinese elm and other weed species have increased. Weeds have the potential to reduce land productivity to the point that it has little wildlife value. Weed infestations are

exacerbated by reduced funding for treatment on federal lands, absentee landowners without a historical weed knowledge, and increased disturbance caused by increasing road and housing densities. These weed threats are expected to increase, possibly exponentially, over the timeframe of this plan.

6. Immigration of elk from E-11 and Great Sand Dunes National Park (GSDNP) - Elk in E-11 (GMU 82 just west of E-27) are above objective and have a large refuge within GSDNP. Interchange between the two DAUs is common. Movement data from several radio-collar studies and observations of several radio-collared elk during our winter classification flights have verified the interchange between the two populations. This movement occurs at all times of the year but is most problematic during the winter months because the wintering elk population in E-27 increases. CPW is working with GSDNP to have some form of elk hunting or culling within the park to manage the elk population. The Sangre de Cristo HPP committee is worried that increased hunting pressure within the park and surrounding areas will cause the elk to immigrate into E-27 and raise the elk population further above objective.
7. Declining calf/cow ratios - CPW and the Parks and Wildlife Commission (PWC) have identified declining calf/cow ratios as a concern in elk herds throughout the southern portion of the state. Like other DAUs, over the past observed calf/cow ratios have been declining in E-27 since approximately 2010 (Figure 18).
8. CWD - CWD has not been detected in elk in E-28 at the time this plan was written. This may be due to the small number of elk heads that have been submitted to be tested. CPW will continue to monitor for CWD within the DAU.

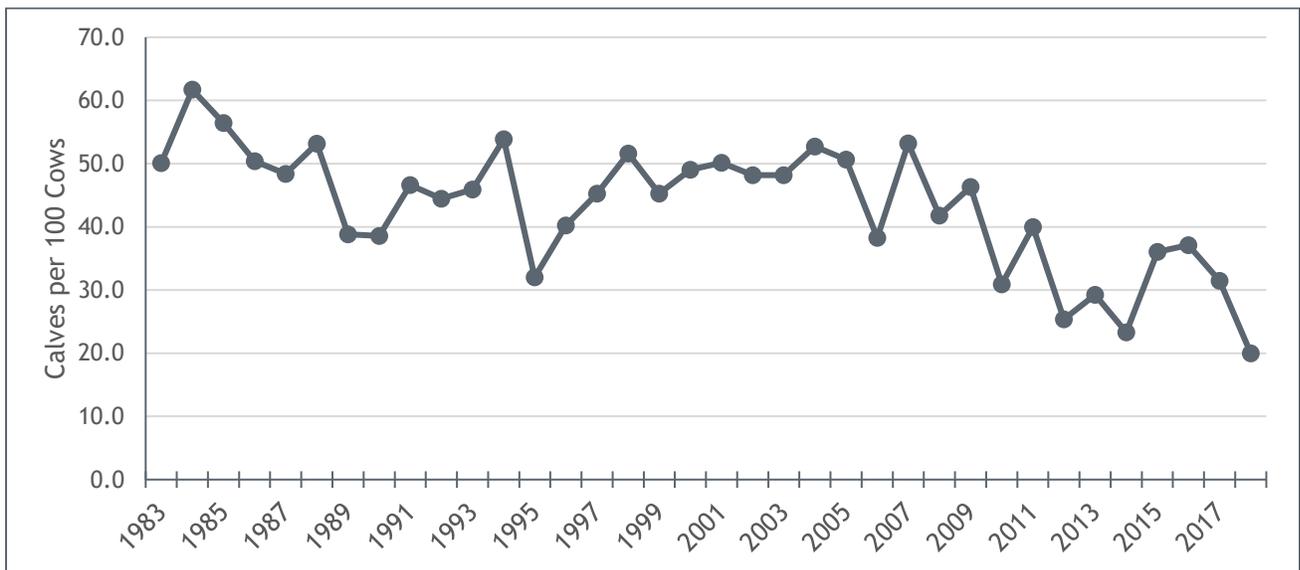


Figure 18. E-27 Calves:100 cows, 1983-2018.

## ALTERNATIVE DEVELOPMENT

### *Management Alternatives and Preferred Objectives*

#### **Herd Composition (Bull/Cow Ratio)**

The E-27 elk herd is managed for unlimited over-the-counter hunt opportunity with a 4-point restriction on bulls. The majority of harvest in OTC DAUs is not controlled by a limited number of licenses but rather dependent upon aspects such as weather and hunter numbers during the 2<sup>nd</sup> and 3<sup>rd</sup> rifle seasons. Therefore, there is a lower chance to affect bull:cow ratios in these DAUs. Thus, the expected sex ratio range is more of a descriptive statistic than an objective.

*Expected post-hunt sex ratio range: 18-30  
(Post-hunt 2018 observed: 24; modeled: 22)*

#### **Population Objective**

The primary focus of this plan is on developing management alternatives for population size. The long-term population objectives for this herd should be managed as ranges, rather than point values. Objective ranges better reflect the uncertainty inherent in wildlife population estimates. Also, having the flexibility to manage this elk herd within a range is more fitting to annual variability in ecological conditions. References below to the current population are based on the 2018 post-hunt population of 2,100.

The historic population objective of 1,450-1,650, approved in 2007, was set to mitigate game damage on hayfields and winter cattle forage. As the elk population has moved towards the objective, game damage conflicts have generally been mitigated. Landowner tolerance for the current population has increased as we have attempted to drive the population towards the objective.

**Alternative 1:** (Status Quo) Maintain a population objective of 1,450-1,650 elk.

This is the current objective for the DAU and is about 26% below the estimated 2018 post-hunt population. Despite increasing license numbers, we have not been able to reduce the elk population to objective through increased harvest. With the high level of hunter pressure on the public lands, elk movement to artificial refuges and private lands inhibits any further population reduction. Landowners have also indicated that the current harvest rate is a burden and it may not be possible to drive this population any lower.

**Alternative 2:** Increase the population objective to 1,800-2,200 elk. **(Approved Alternative)**

This alternative includes the current estimated population size and is approximately 25% above the 2007 population objective. Based on our survey responses, stakeholders support an increase in the elk population. We have met with the landowners in the Hillside conflict area and they are willing to support this increase as long as dispersal licenses are available to manage their conflicts. Since the current elk population size falls within this objective range, we will be able to maintain this population at current or slightly lower license levels.

## PUBLIC COMMENT PERIOD

### *Outreach efforts*

After proposing the two population alternatives, we finalized a draft DAU plan and used multiple avenues to solicit stakeholder feedback. The draft DAU plan was posted on the CPW website from 15 July 2019 through 13 August 2019. We sent the draft DAU plan to the County Commissioners from Custer, Fremont, Huerfano and Pueblo Counties. Plans were also sent to sportsmen and landowners who had either routinely discussed elk management with local DWMs or who had expressed an interest in reading the draft during the initial scoping process.

On 9 May 2019 a short presentation was given to the Sangre de Cristo Habitat Committee on the draft plan. Past elk/livestock forage conflicts were outlined and a letter supporting the preferred population alternative was received from the Committee chairman. This letter of support can be viewed in Appendix C.

Only one comment was received from the 30 day comment period (Appendix D).

## STRATEGIES TO ADDRESS ISSUES AND MANAGEMENT CONCERNS

CPW has limited ability to affect several of the issues identified by stakeholders and staff, including housing development, elk taking refuge on private lands, and hunter access. However, we will seek any opportunities available to conserve large tracts of land through fee title purchase or conservation easements, which may contain a hunting access component. CPW will maintain the current extended PLO hunting season to disperse elk from private property and onto public lands. To address game damage, CPW will continue to offer dispersal licenses for landowners that are experiencing elk conflicts that cannot be addressed through the general hunting seasons. Additionally, we will continue to look for opportunities for hunter access on or through private property.

Elk habitat in E-27 has been lost through development, forest encroachment, and noxious weeds. While we cannot mitigate every change to elk habitat, CPW will work with land management agencies and landowners to make habitat improvements where possible. Additionally, there have been several improvements to elk habitat in the DAU since approval of the last plan. Several fires have burned in GMU 86 within E-27. The Medano Pass fire, while mostly within E-11, burned over the pass and improved 975 acres within E-27. The Duckett Creek fire burned in 2011 and improved 4,600 acres. The Hayden pass fire burned 16,754 acres in 2016. These fires have improved the areas within the burn scar and are causing shifts in elk distribution from surrounding areas. Additionally, changes in the high elevation habitat due to a spruce die-off is holding the elk on the public lands slightly longer, and has drastically increased habitat quality in these areas. This may be a short-term improvement to summer range.

CPW will work collaboratively with all land management agencies to address elk management concerns on both sides of the Sangre de Cristo range.

There is currently a study in E33, to the south of E-27, to examine the cause of declining calf/cow ratios. Results from that study will help inform future management decisions aimed at increasing calf/cow ratios.

**STRATEGIES FOR ACHIEVING OBJECTIVES**

Since the elk population is currently within the objective range, the population can be maintained within through current or slightly lower license numbers. As is currently done on an annual basis, license numbers will be reevaluated as new data becomes available.

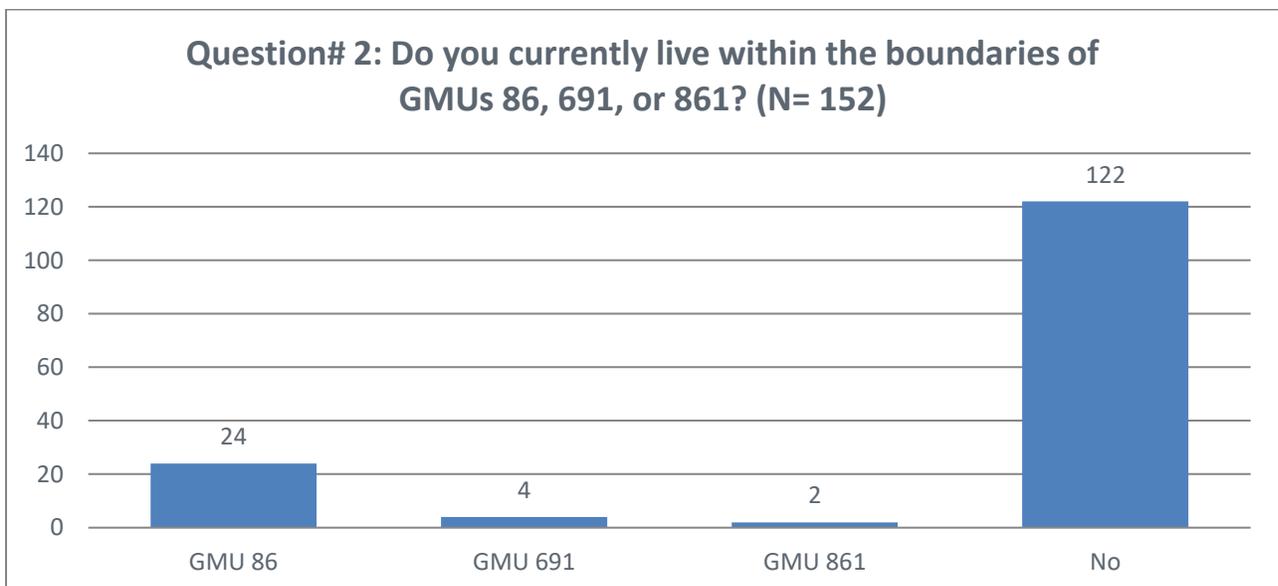
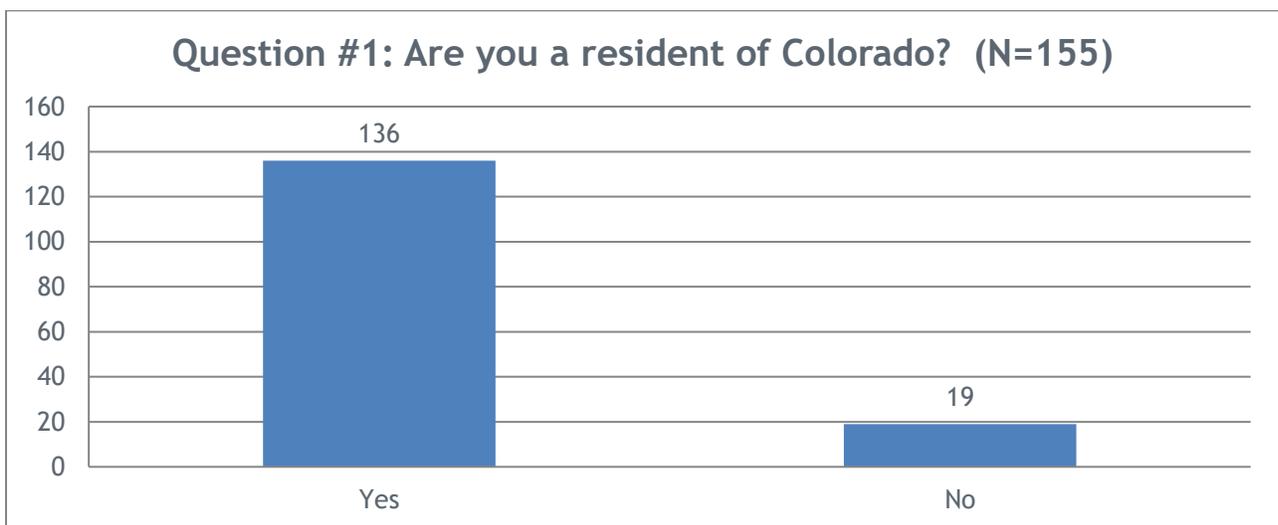
## LITERATURE CITED

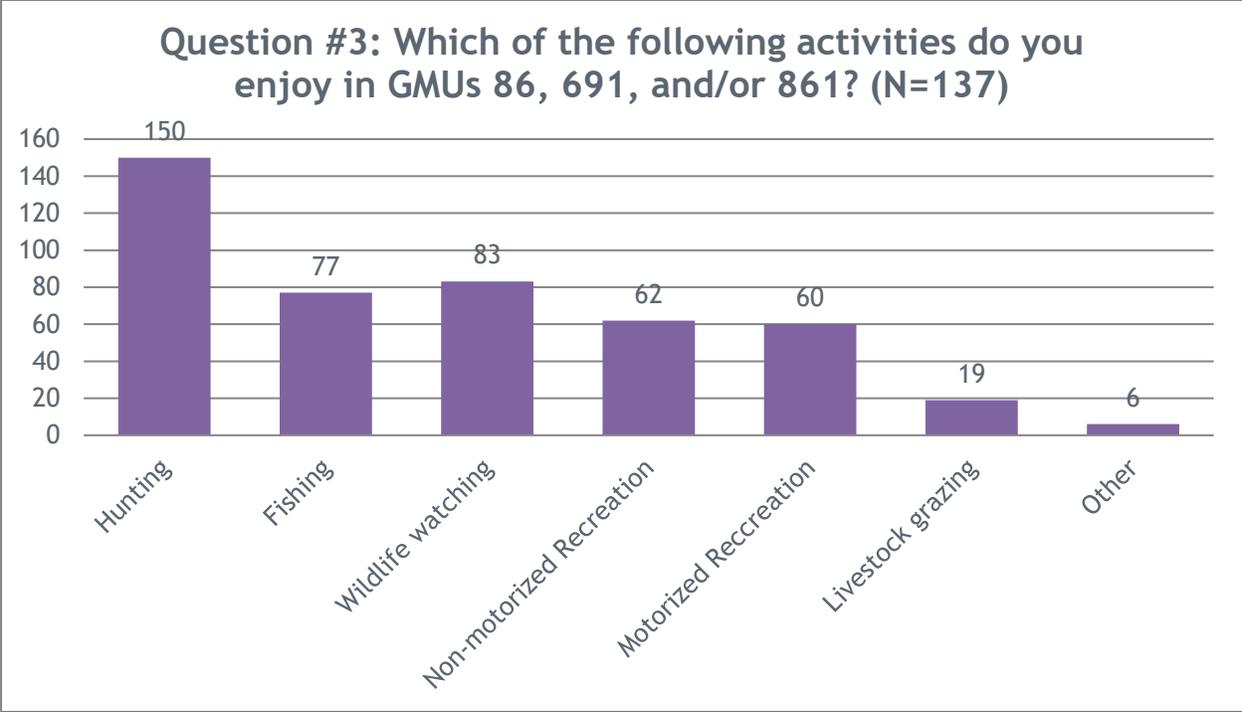
- Johnson, H. E., J. Sushinsky, A. Holland, E. J. Bergman, T. Blazer, J. Garner and S. E. Reed (2016) Increases in residential and energy development are associated with reductions in recruitment for a large ungulate. *Global Change Biology*. 23:578-591.
- Mikle, N. L., T. A. Graves, and E. M. Olexa. 2019. To forage or flee: lessons from an elk migration near a protected area. *Ecosphere*. 10:1-15.
- Vieira, M. E. P., M. M. Conner, G. C. White, and D. J. Freddy. 2003. Effects of archery hunter numbers and opening dates on elk movement. *Journal of Wildlife Management*. 67:717-728.

## Appendix A: 2017 E-27 Hunter Questionnaire Results

In September of 2017, we conducted a survey of hunters in E-27 using two different methods. First, we mailed hard copy surveys to 448 hunters that had applied to hunt in E-27. Hunters were asked to fill out the survey and return it in a prepaid return envelope. Second, we mailed 448 postcards to hunters and asked them to go online and complete the same survey. Our goal was to examine response rates of returned surveys using these two methods. In total, we received 130 mailed in. For the online survey, we received 25 responses. Unfortunately, there was a printing error on the postcards that said the online survey was already closed before the postcards were mailed out, preventing any comparison between the two methods.

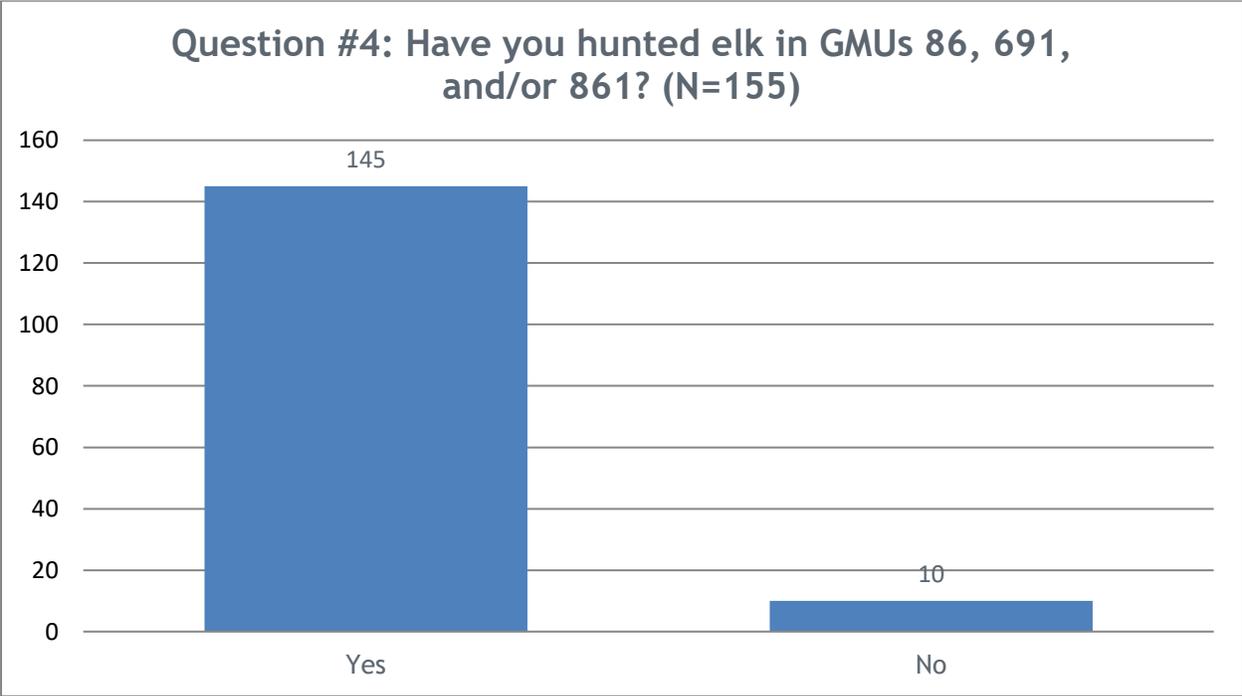
The following results are aggregate responses from both survey methods.

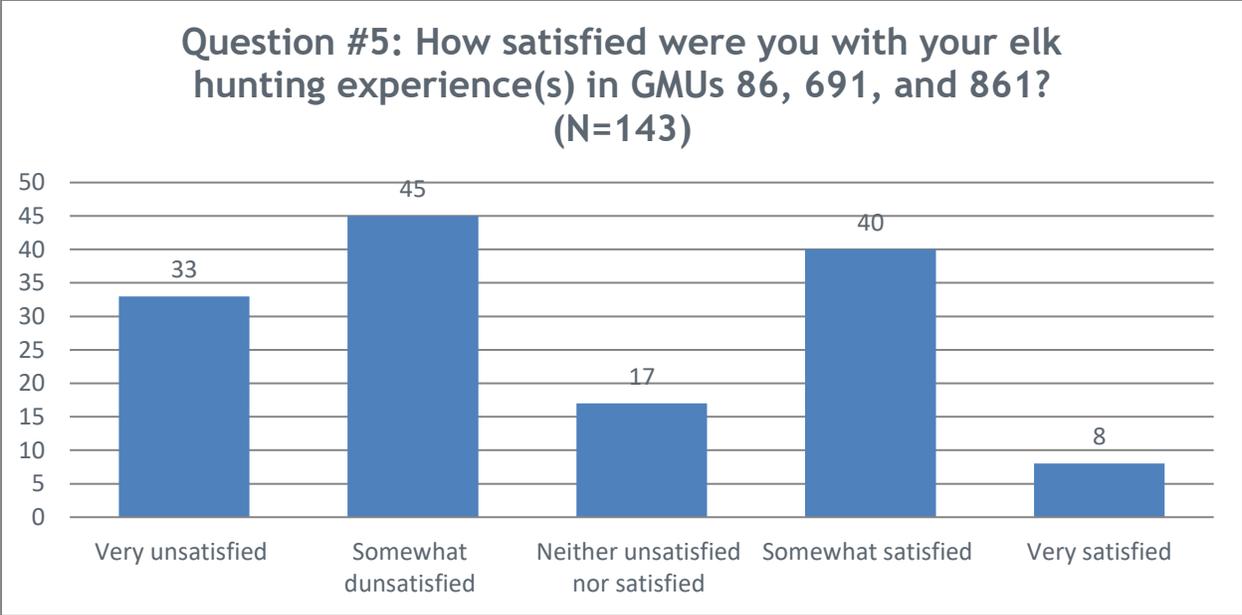




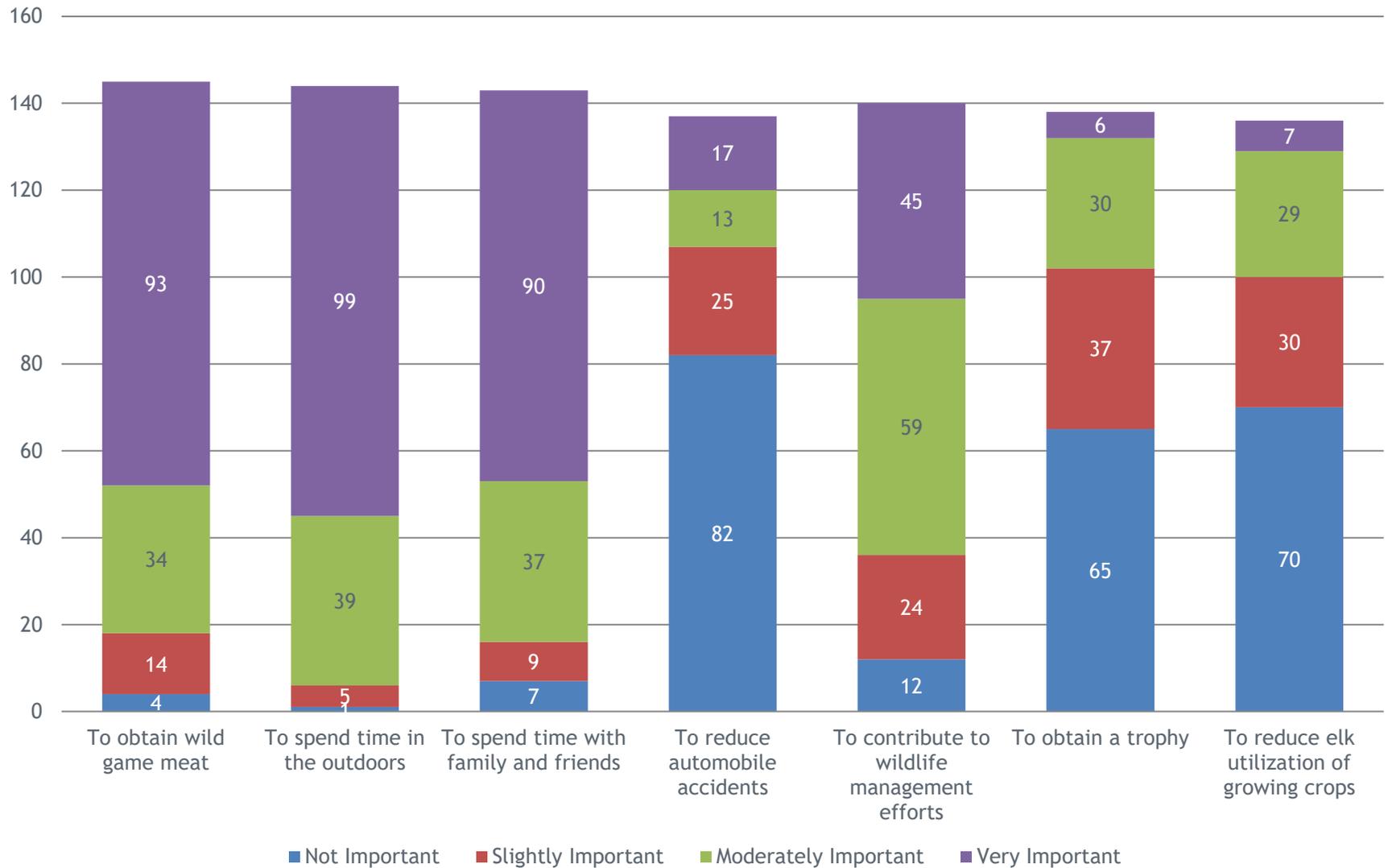
Other activities listed include:

- Camping
- Horeseback riding
- Climbing
- Mountain property



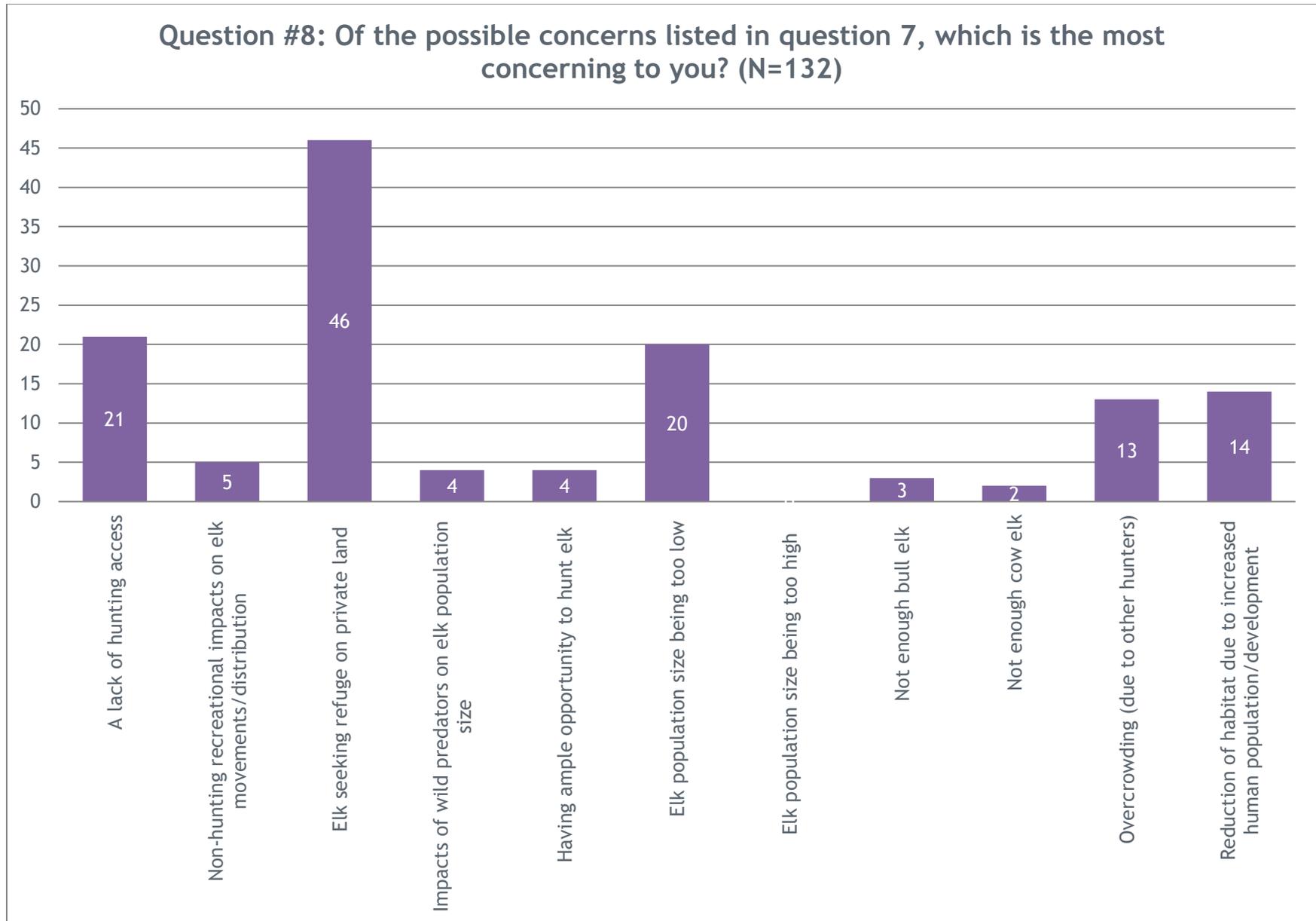


**Question #6: How important to you is each of the following reasons to hunt elk in GMUs 86, 691 and/or 861? (N=143)**

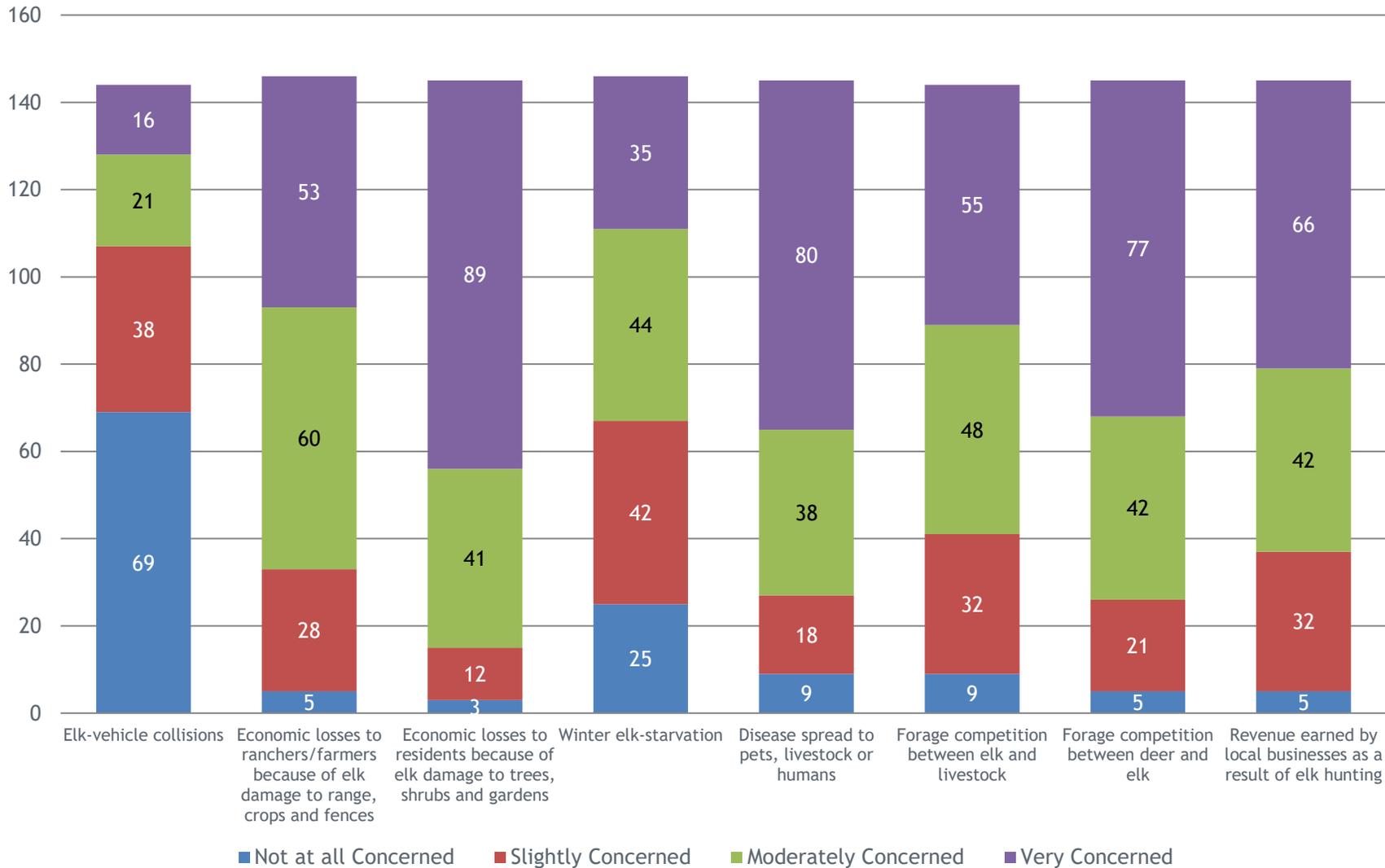


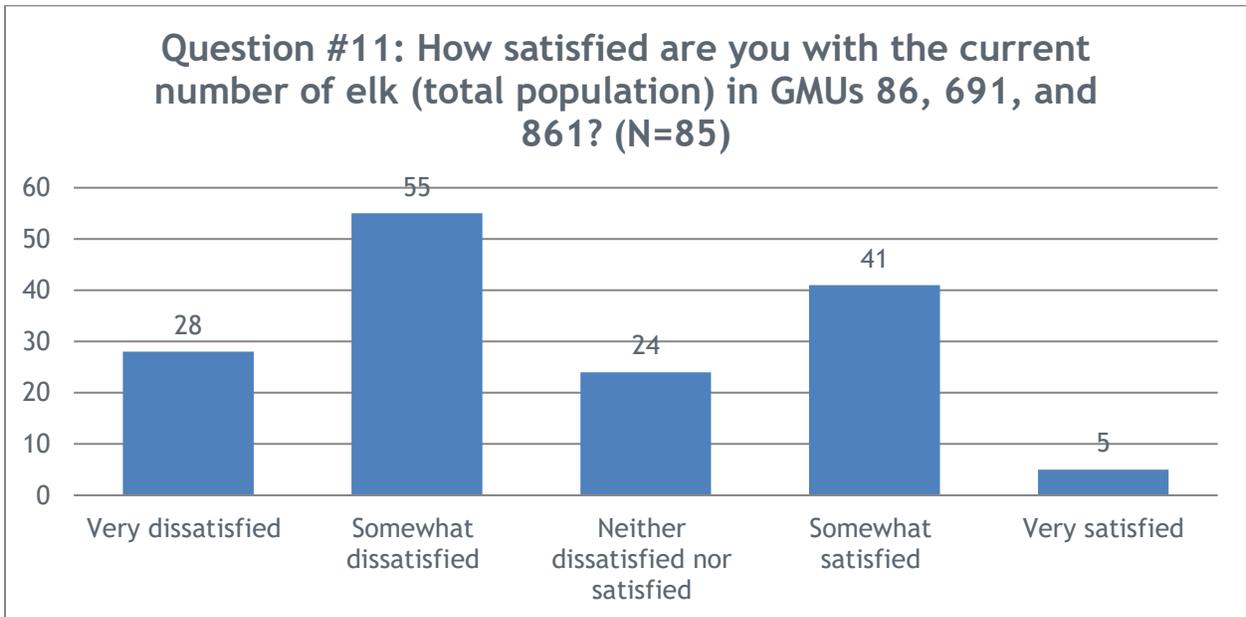
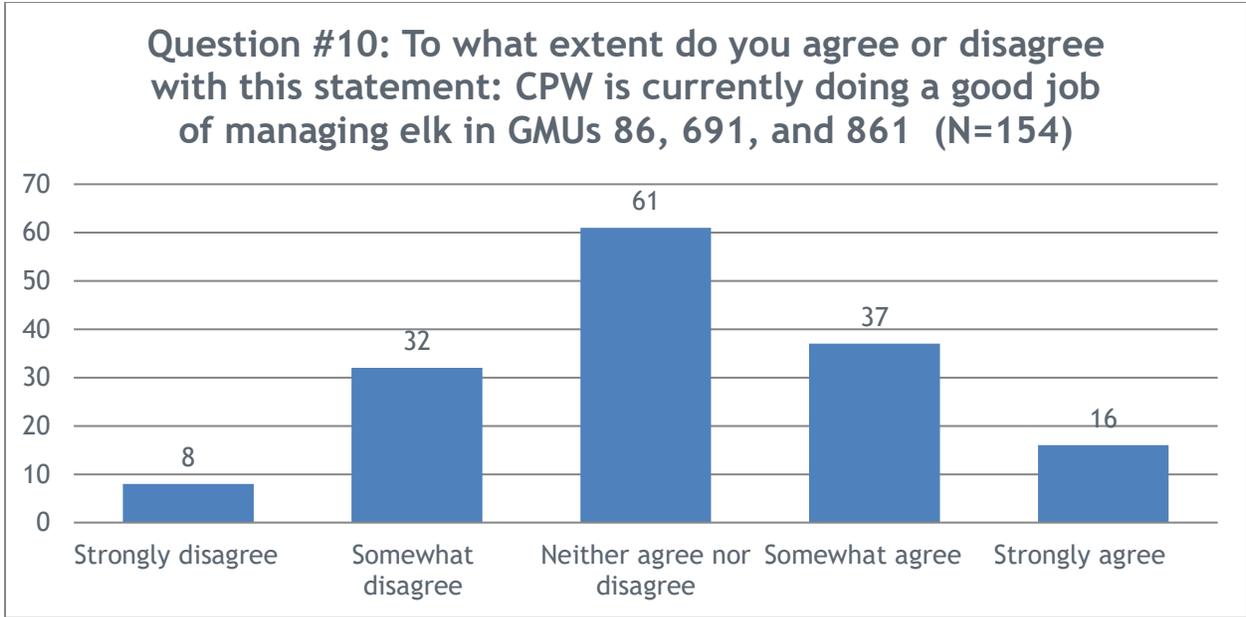
**Question #7: The following is a list of possible concerns that hunters may have with elk in GMUs 86, 691 or 861. How concerned are you about each of the following? (N=143)**

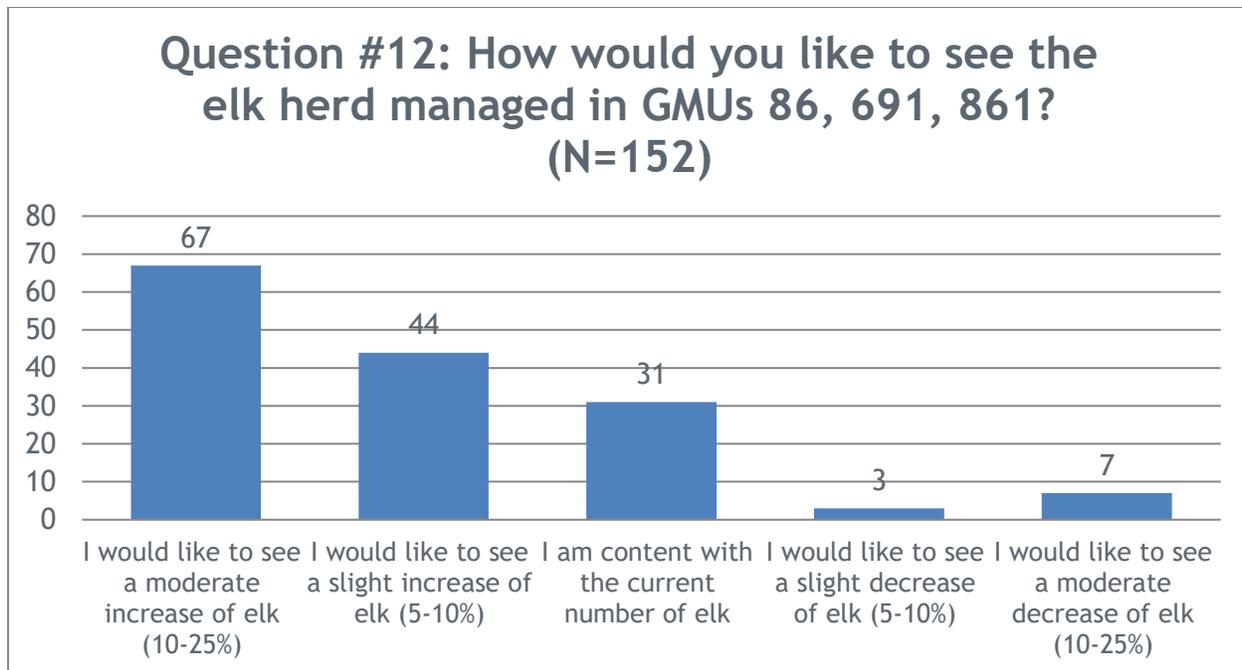




**Question 9: The following is a list of possible concerns that people may have with elk in GMUs 86, 691 or 861. How concerned are you about each of the following? (N=144)**





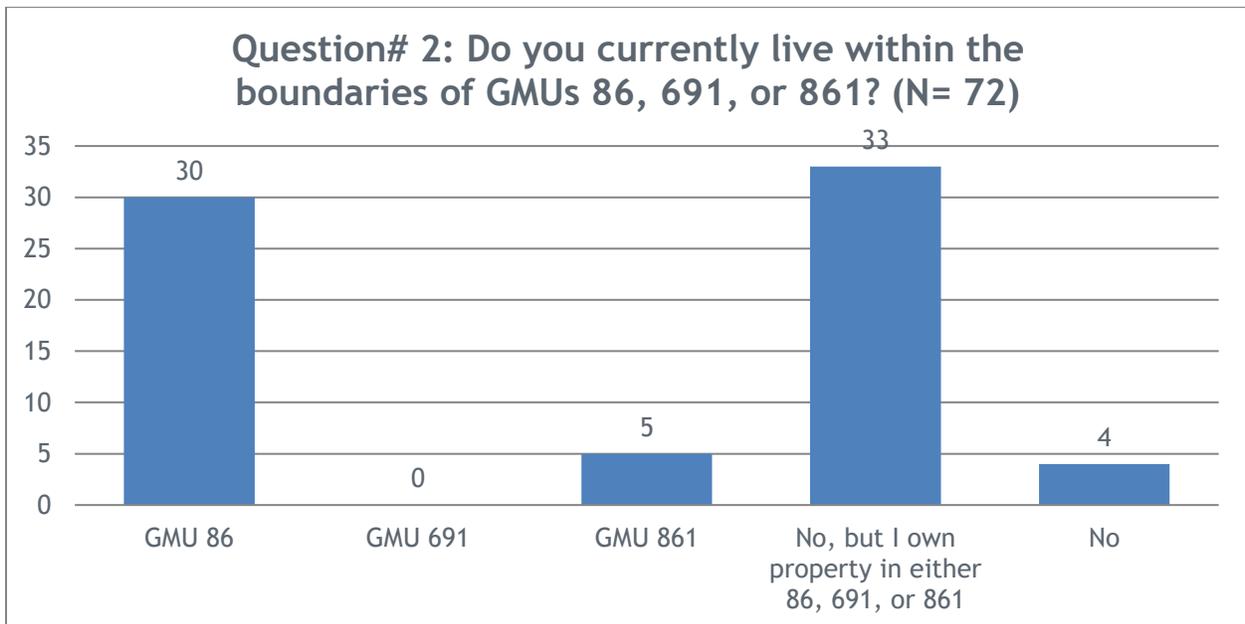
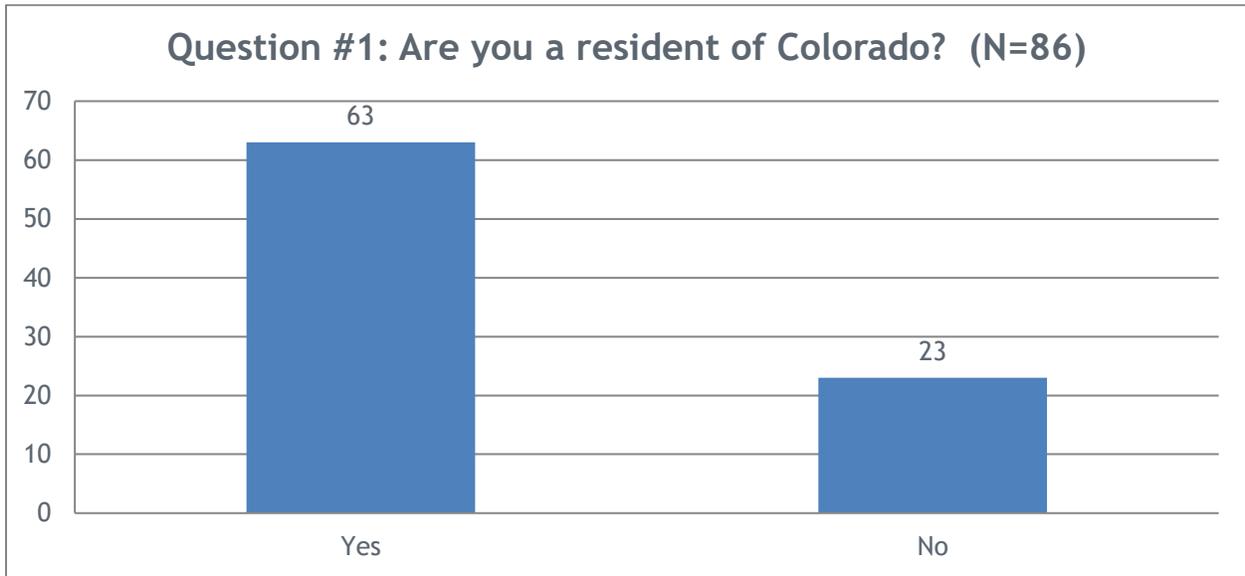


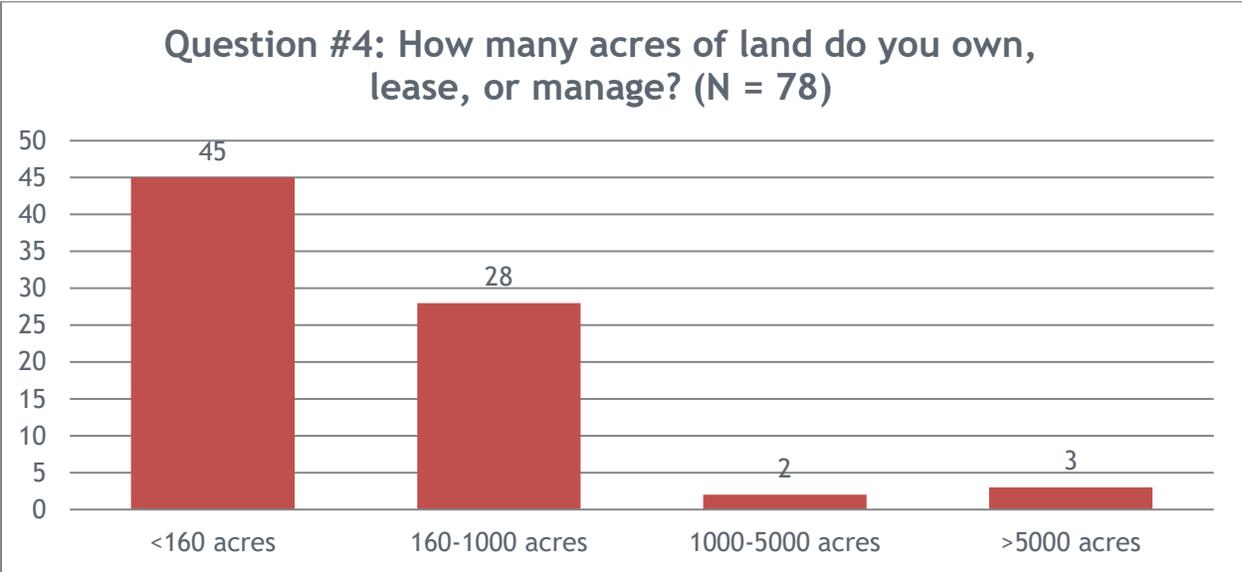
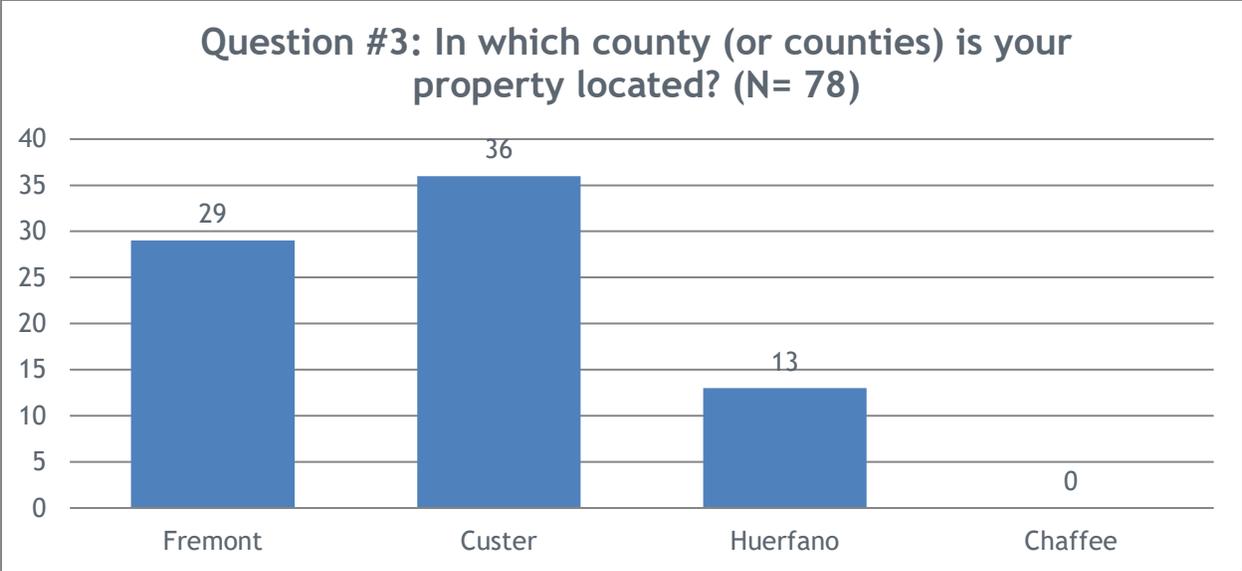
**THE LAST QUESTION OF THE SURVEY PROVIDED SPACE TO WRITE WRITTEN COMMENTS. COMMENTS WERE SUMMARIZED INTO GROUPS FOR BREVITY:**

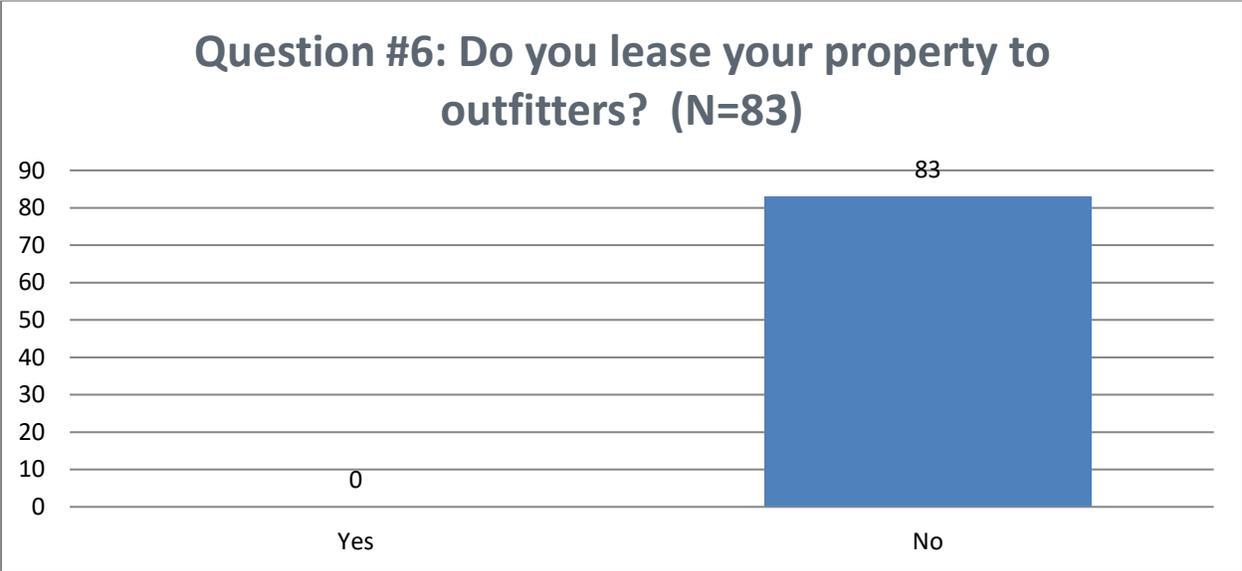
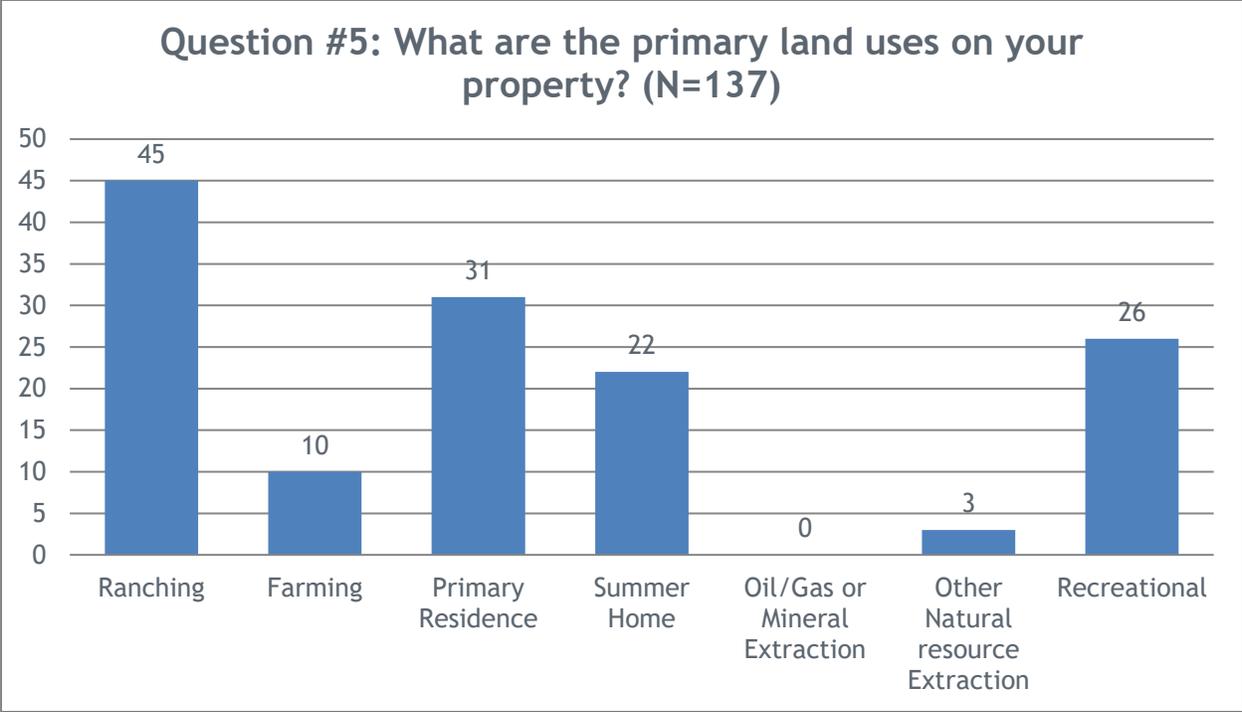
COMMENTS ABOUT ACCESS/LACK OF ACCESS TO PRIVATE PROPERTY: 20 COMMENTS  
 TOO MANY LANDOWNER VOUCHERS: 6 COMMENTS  
 WOULD LIKE TO SEE MORE ELK: 5 COMMENTS  
 COMMENTS RELATED TO REDUCING NR ALLOCATION: 5 COMMENTS  
 COMMENTS RELATED TO MAKING THE DAU LIMITED ALL METHODS OF TAKE: 3 COMMENTS  
 TOO MUCH HUMAN DEVELOPMENT: 3 COMMENTS  
 TOO MANY MOUNTAIN LIONS: 3 COMMENTS  
 COMMENTS ABOUT LANDOWNERS HERDING ELK OFF PUBLIC LANDS: 3 COMMENTS  
 THINGS ARE CURRENTLY WORKING: 2 COMMENTS  
 COMMENTS ON INCREASING CPW LAW ENFORCEMENT: 2 COMMENTS  
 COMMENTS ON DECREASING THE NUMBER OF ANTLERLEES LICENSES: 2 COMMENTS  
 COMPLAINTS ABOUT "OTHER" RECREATION DURING HUNTING SEASON: 2 COMMENTS  
 DECREASE ATV ACCESS: 1 COMMENT  
 ARCHERY LICENSES SHOULD BE LIMITED: 1 COMMENT  
 INCREASE THE OPPORTUNITIES FOR YOUTHS: 1 COMMENT  
 ISSUES RELATED TO ILLEGAL ATV USE: 1 COMMENT  
 TOO MANY DEER: 1 COMMENT  
 TOO MANY BEARS: 1 COMMENT

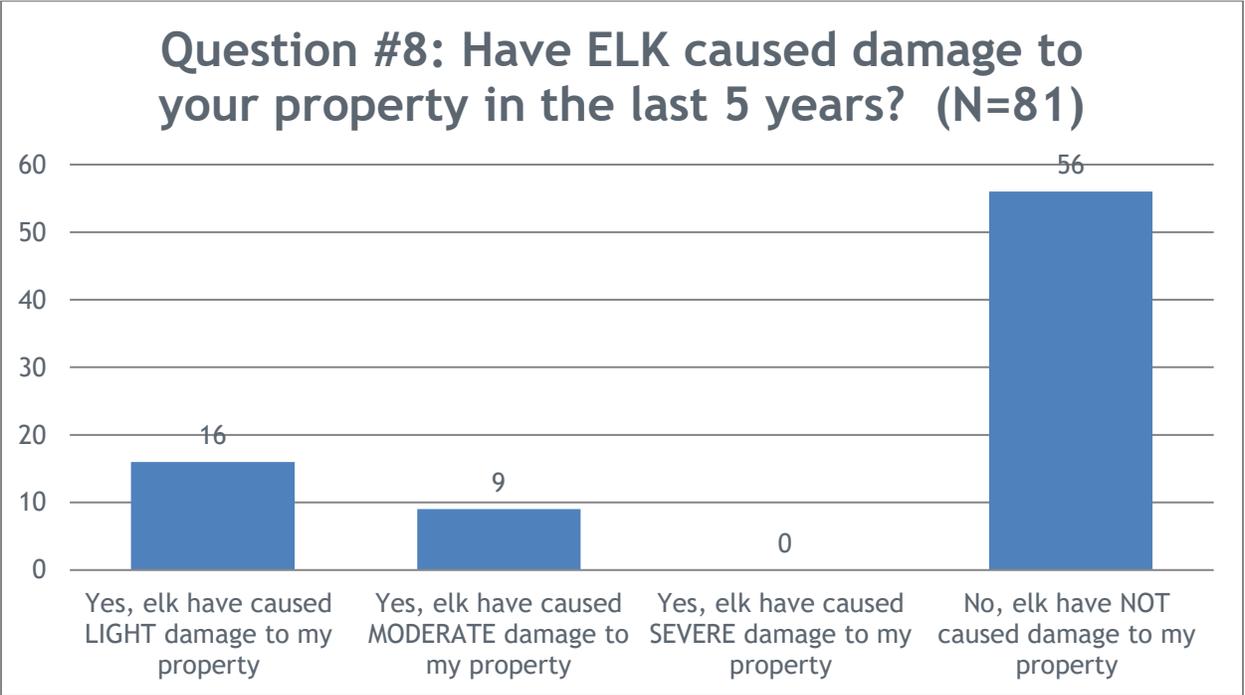
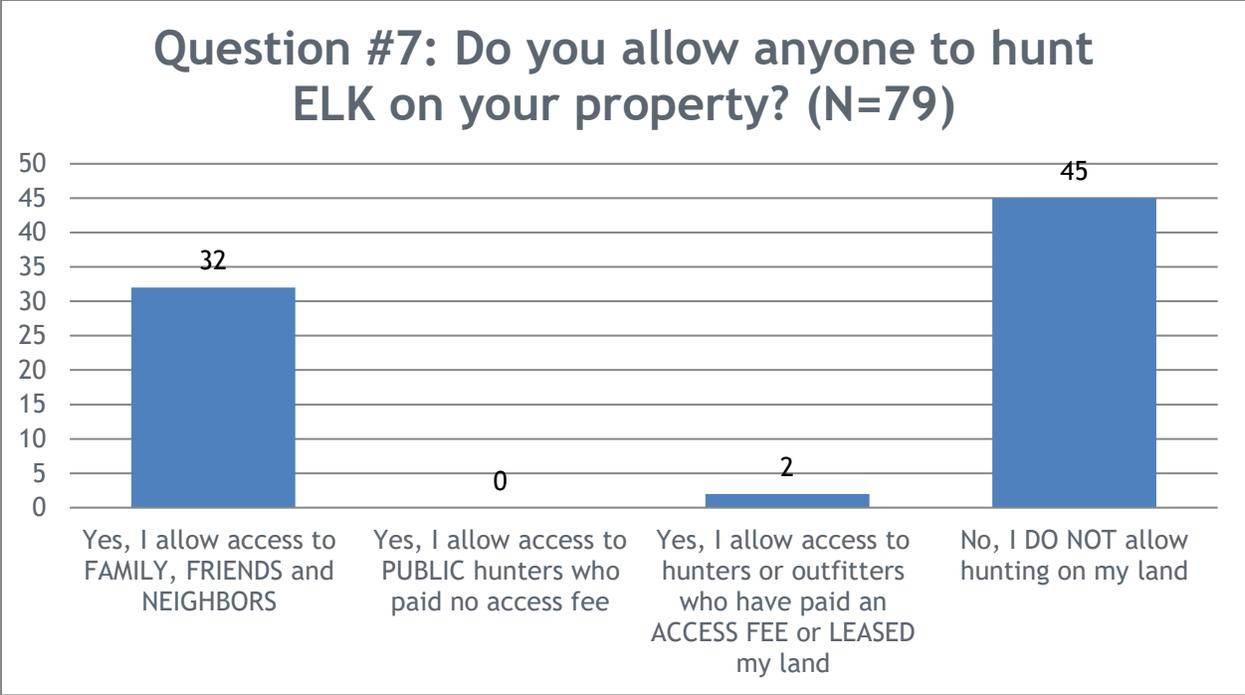
## Appendix B: 2017 Landowner Questionnaire Results

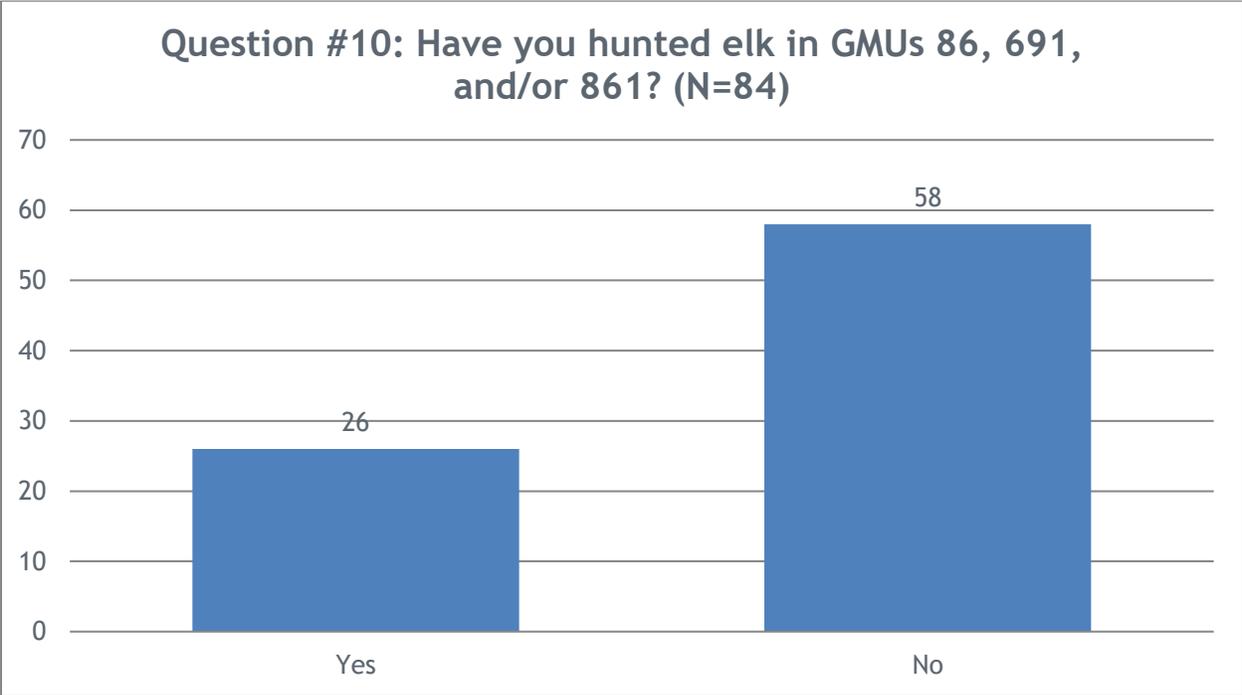
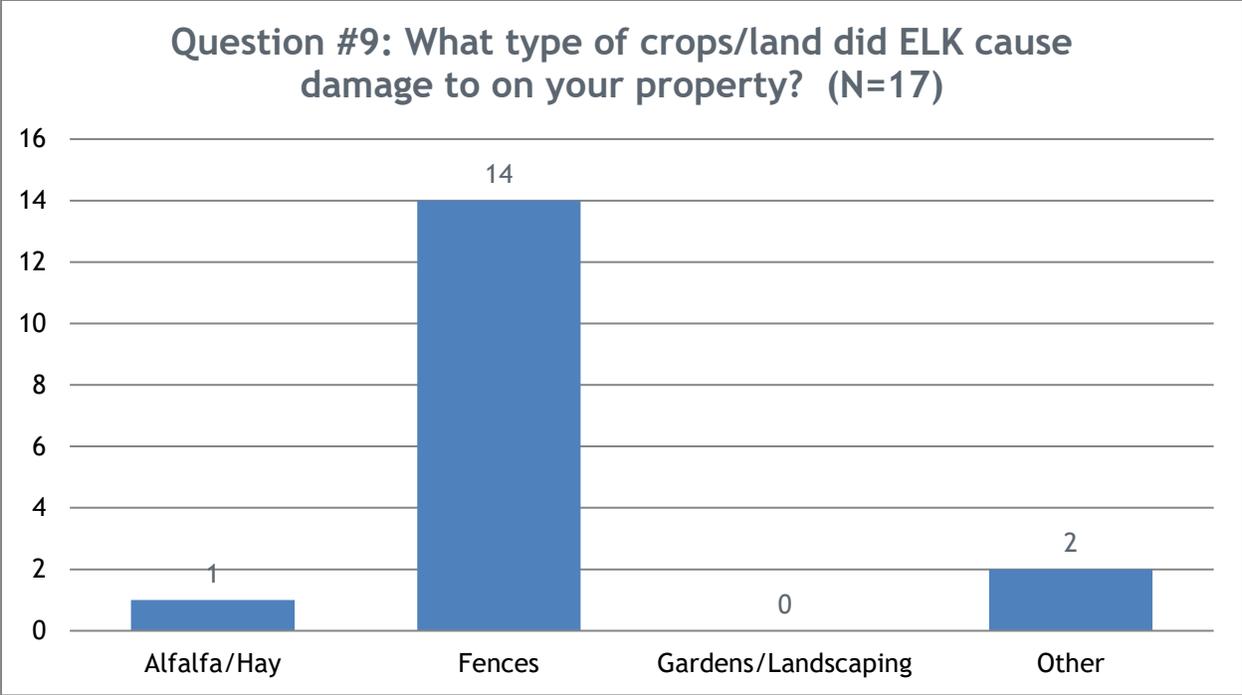
In September of 2017, we mailed 270 surveys to landowners that owned property in E-27. Landowners were selected at random if they owned more than 40 acres within the DAU. If selected landowners were sent a paper survey and asked to return the survey in a prepaid return envelope. The survey contained 16 questions. Of the 270 surveys sent out, we received responses from 87 landowners. Here are the results of the survey:



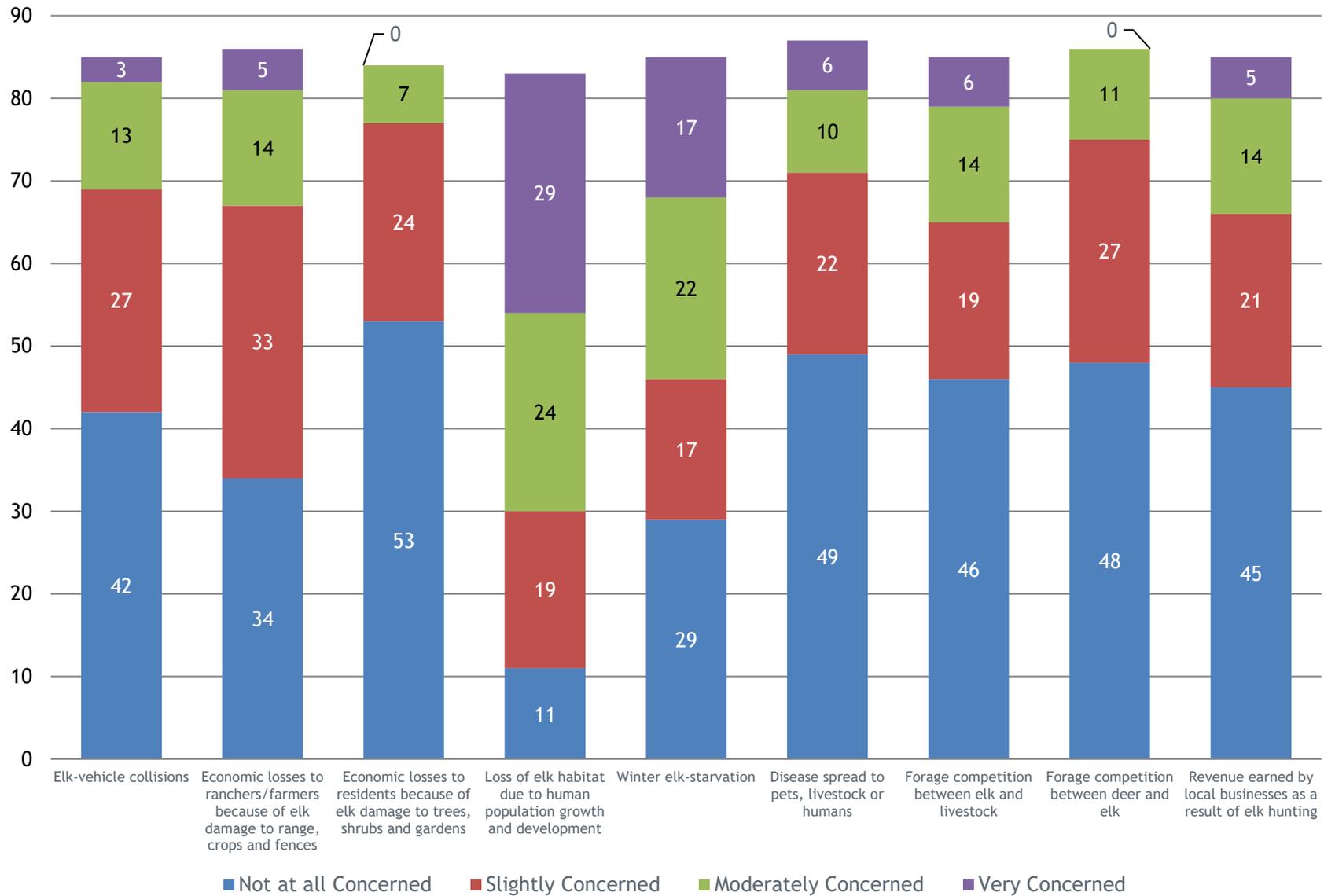


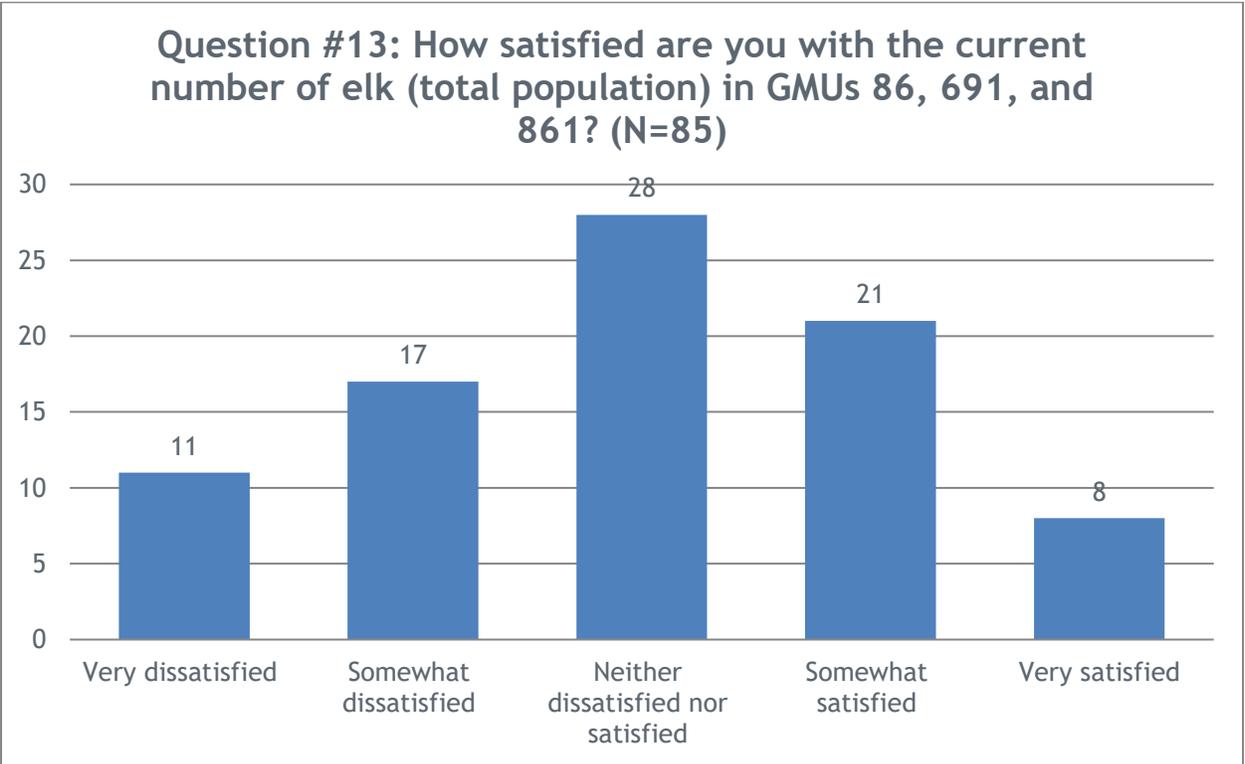
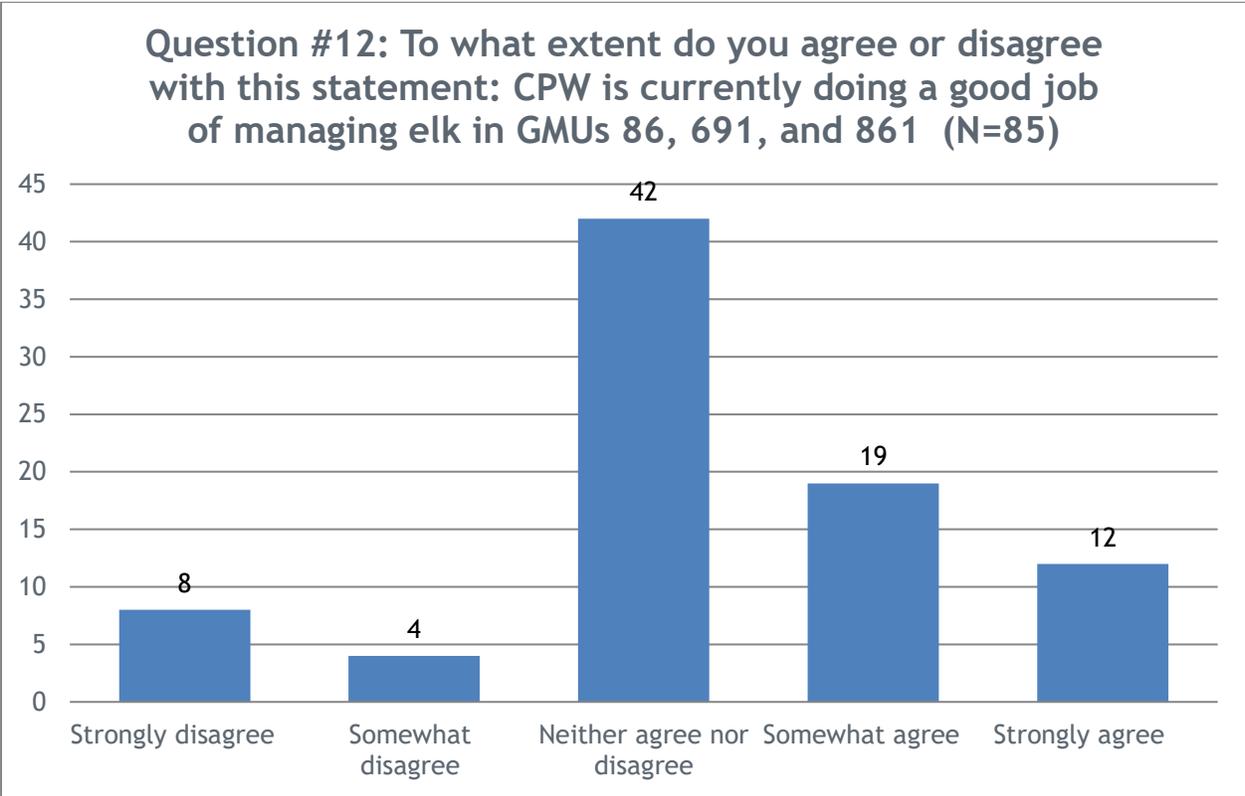


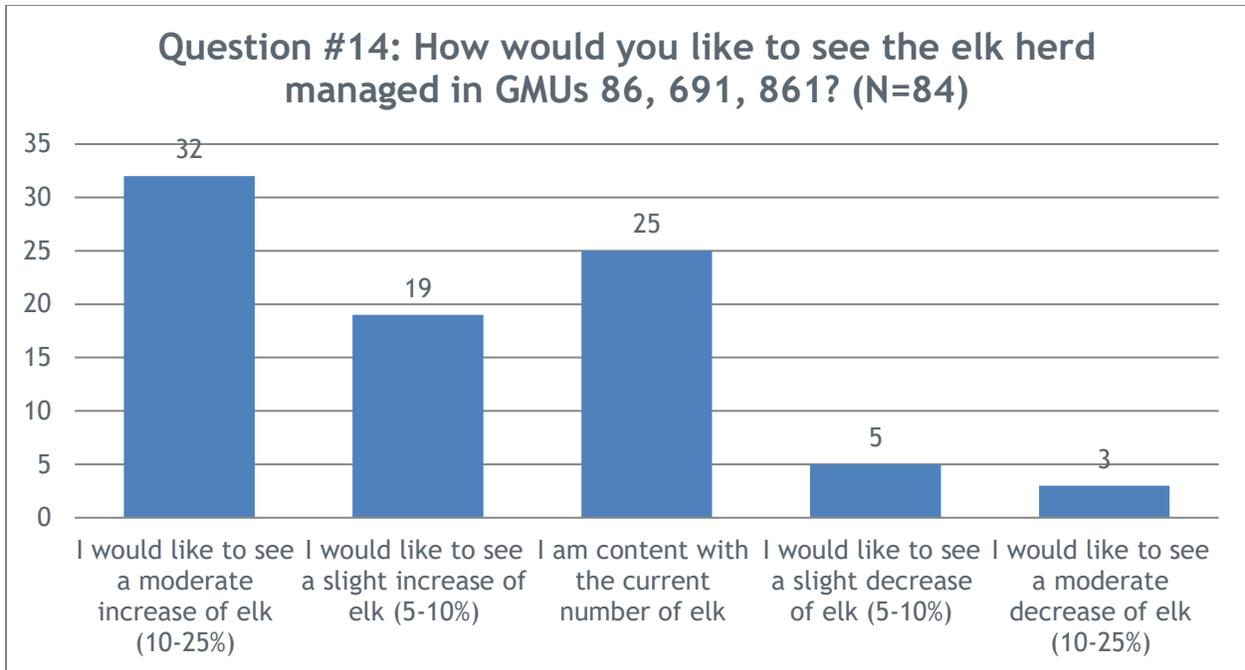




Question 11: The following is a list of possible concerns that people may have with elk in GMUs 86, 691, or 861. How concerned are you about each of the following? (N=87)







**THE LAST QUESTION OF THE SURVEY PROVIDED SPACE TO WRITE WRITTEN COMMENTS. COMMENTS WERE SUMMARIZED INTO GROUPS FOR BREVITY:**

- WOULD LIKE TO SEE MORE ELK: 6 COMMENTS
- COMMENTS RELATED TO REMOVING THE LONG ANTLERLESS SEASON: 4 COMMENTS
- TOO MANY DEER: 3 COMMENTS
- THINGS ARE CURRENTLY WORKING: 1 COMMENT
- ISSUE MORE LANDOWNER LICENSES: 1 COMMENT
- WOULD LIKE TO SEE BETTER HUNTER ACCESS: 1 COMMENT
- WOULD LIKE TO SEE ANTLERLESS LICENSES BECOME OTC: 1 COMMENT
- ALL LICENSES SHOULD BE LIMITED: 1 COMMENT
- DECREASE NR PARTICIPATION: 1 COMMENT
- COMMENTS NOT SUPPORTING CULLING PREDATORS TO INCREASE ELK: 1 COMMENT

## Appendix C: Sangre de Cristo HPP Letter of Support



May 23, 2019

Allen Vitt  
Colorado Parks and Wildlife  
600 Reservoir Road  
Pueblo, CO 81005

**RE: Sangre de Cristo Habitat Partnership Program Comments - DAU E-27**

Dear Allen:

One of the initial reasons for creating the Habitat Partnership Program was to provide local landowners and other interests an opportunity for input into big game management in their areas. The diverse makeup of local HPP committees (3 livestock growers, Forest Service, BLM, CPW and sportsmen representatives) provide a good cross section of local interests to review DAU proposals and respond accordingly for CPW consideration.

HPP has two purposes; to resolve big game wildlife (deer, elk, pronghorn, moose) conflicts with agricultural landowners and to assist CPW to meet game management objectives for those same species. From those perspectives, the Sangre de Cristo HPP committee has discussed your presentation, reviewed the draft alternatives and offer these comments for consideration.

The Sangre de Cristo HPP committee is in agreement with the following comments pertaining to proposals for the population range objectives for the above DAU plan.

The Sangre de Cristo committee supports the draft alternative to increase the number of animals within this DAU and within our committee area. The Sangre de Cristo committee does not believe this increase would create more conflicts and we also believe we have the resources necessary to address conflicts should they occur. Increasing the population objective will ultimately lead to more hunting licenses and sportsmen opportunities.

As stated above, HPP is also directed by statute to assist the Division to meet game management objectives. The Sangre de Cristo committee has worked with both public land managers and private landowners to improve the quality and quantity of the habitat in DAU-E 27. Adequate habitat is critical to meeting game management objectives and we remain committed to maintaining and improving habitat in this area.

Our committee is confident about CPW being able to achieve the proposed objectives for the following reasons:

We have worked with numerous landowners who want to implement positive improvements for big game on their property. The committee has also seen an increase in conservation easements on private lands, so we are confident that valuable wildlife habitat will continue to be available and protected into the future.

Federal land managing agencies place a high priority on habitat improvement and have worked successfully with our committee on valuable projects in the past and have expressed a desire to

continue this. In addition, recent wildfires on public lands have resulted in improved habitat for wildlife. We feel that this will help to draw big game to public lands and will reduce conflicts on private lands.

The Sangre de Cristo committee feels there is adequate habitat with adequate protections in place, such as seasonal closures, use restrictions, and conservation easements, all of which will help to achieve the desired objectives. We are confident that the proposed alternative will be positive for the area, and we have confidence in the plan's objectives over the next ten years. Residential growth and increased recreation demands could hinder future population objectives, so the committee will continue to work with landowners on resolving conflicts and protecting and enhancing wildlife habitat in the area.

Thank you for the presentation and the opportunity to provide these comments.

Sincerely,

A handwritten signature in blue ink, appearing to read "John Stroh II", with a large, stylized flourish extending to the right.

John Stroh II, Chair  
Sangre de Cristo HPP Committee

## **Appendix D: Comments From 30 day comment period**

From a Fremont County Commissioner: I have visited with several cattlemen in both of these plans. They are concerned if the number of tags offered is lowered they would have more problems with elk herds as their numbers increase.

Consciences: Leave the same or add more tags.

Thanks for the opportunity to comment.