

GRAPE CREEK ELK HERD MANAGEMENT PLAN DATA ANALYSIS UNIT E-28

GAME MANAGEMENT UNITS

69, 84

PREPARED FOR

COLORADO PARKS AND WILDLIFE



BY

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This plan was approved by the Colorado Parks and Wildlife Commission
on
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EXECUTIVE SUMMARY

Grape Creek Elk Herd (DAU E-28)	GMUs: 69, 84
Posthunt Population: Previous Objective: 1,400-1,600 elk; Estimate for 2018: 2,100.	
Approved Objective: <u>2,400-2,800</u>	
Posthunt Sex Ratio (Bulls:100 Cows): Previous Objective: 35-40;	
Posthunt 2018 observed: 42; modeled: 38. Approved Objective: <u>35-40</u>	

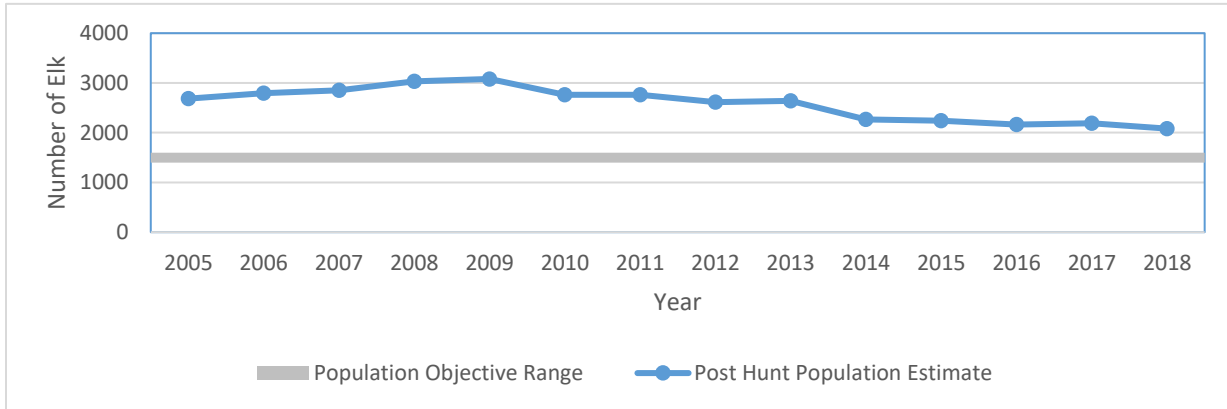


Figure 1. Elk DAU E-28 DAU modeled posthunt population and objective range, 2005-2018.

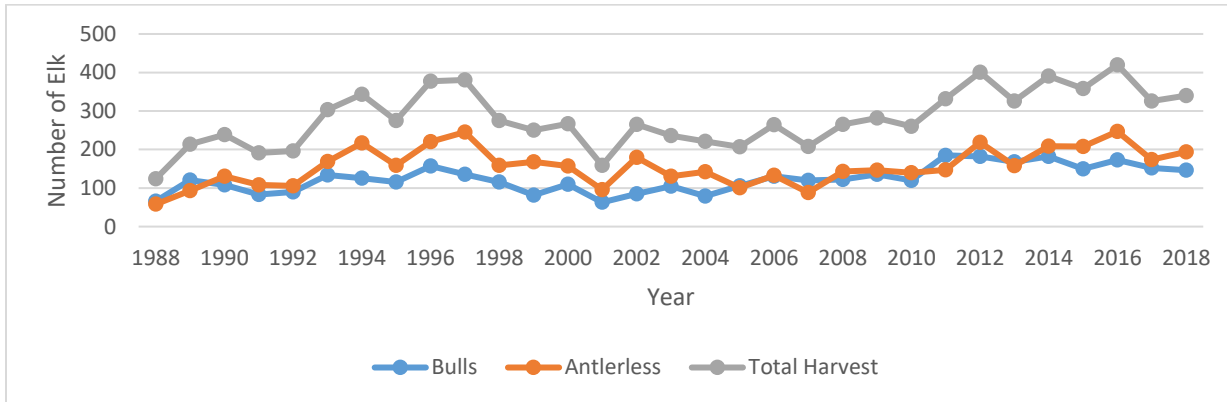


Figure 2. Elk harvest estimates in E-28, 1988-2018.

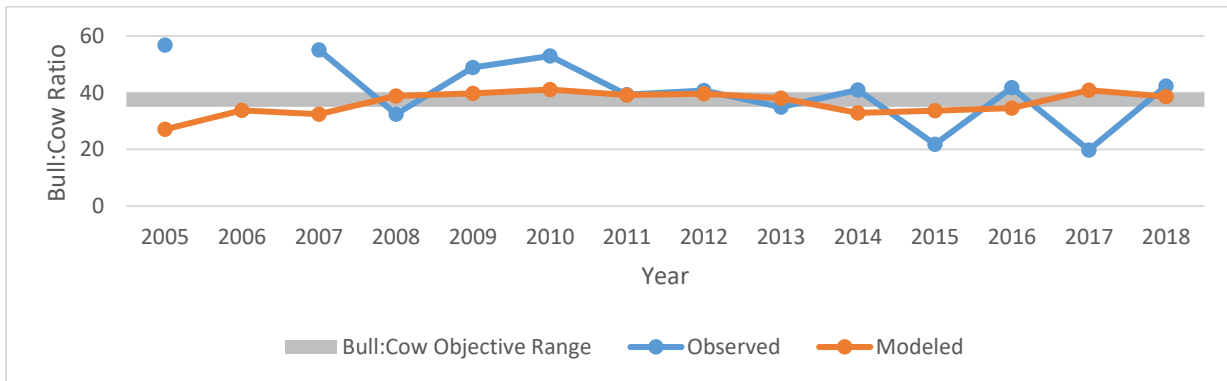


Figure 3. Elk DAU E-28 observed and modeled posthunt sex ratio (Bulls:100 Cows), 2005-2018.

Background Information

The Grape Creek elk Data Analysis Unit (DAU E-28), located in southcentral Colorado, covers 1,571 mi² ranging in elevation from 4,640 ft. to 12,349 ft. Elk generally occupy the area from grassland/shrub winter range adjacent to the foothills to alpine summer range in the Greenhorn Mountains. Over 70% (1,104 mi²) 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 with totally limited licenses for all manners of take. Second, elk harvest is used to mitigate human-elk conflicts, 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 and sex ratio objectives along with identifying 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) Elk taking refuge on private lands, 2) loss of habitat due to development, 3) restricted hunter access, 4) elk damage to fences, 5) noxious weeds and habitat changes due to lack of forest management, and 6) declining calf/cow ratios.

Recommendation to the Colorado Parks and Wildlife Commission

Alternatives for Population Objective

- 1) (Status quo) 1,400-1,600 elk
- 2) Increase the population objective to 1,800-2,200 elk
- 3) Increase the population objective to 2,400-2,800 elk (**Approved objective**)

Alternatives Herd Composition (sex ratio) Objective

- 1) (Status quo) 35-40 bulls:100 cows (**Approved objective**)
- 2) 30-35 bulls:100 cows

Strategies for Addressing Management Issues and Achieving Objectives

CPW has limited ability to affect many of the issues identified through the plan's public outreach process. However, CPW will seek opportunities to conserve land through fee title purchase or conservation easements, especially ones with hunting access. We will maintain the extended PLO hunting season to disperse elk from private property and will offer dispersal licenses for landowners with elk conflicts. We will look for opportunities, working with land management agencies and private landowners, to improve habitat and increase hunter access.

The current elk population size (2,082 elk) and sex ratio (38 bulls per 100 cows) are within the ranges for the respective three alternatives, so we would expect to maintain current or slightly lower license levels depending on which alternative is selected. To manage for Population Alternative 1, additional antlerless harvest would be necessary, which has been unobtainable with current seasons. Population Alternative 3 would necessitate a reduction in antlerless licenses. At higher population sizes, elk damage might increase. To manage for a lower bull/cow ratio, bull licenses would need to be increased, resulting in additional opportunity. However, the age-class and size of bulls might decrease under Composition Alternative 2.

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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).

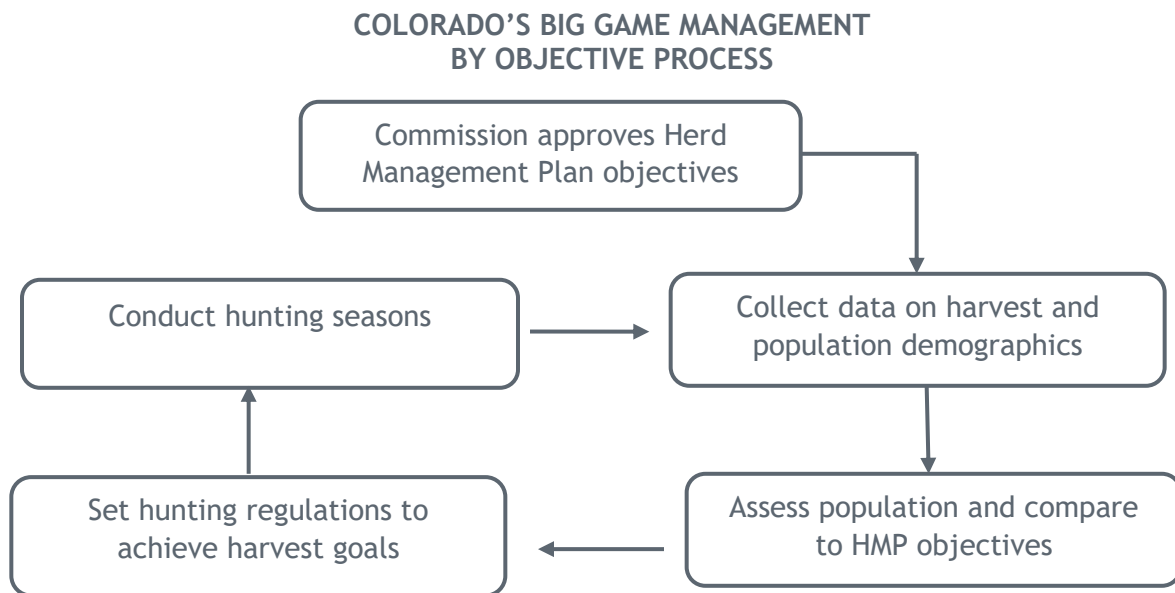


Figure 4. Management by Objective process used by Colorado Parks and Wildlife to manage big game populations by Data Analysis Unit (DAU).

With the Management by Objective approach, big game populations are managed to achieve population objectives established for a 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 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 HMP is to establish population and sex ratio (i.e., the number of males per 100 females) objectives for the DAU. The HMP also describes the strategies and techniques that will be used to reach these objectives. During the HMP 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 a 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 population and sex ratio objectives for the Grape Creek elk herd. The HMP will be in place from 2019-2029 with the expectation that it will be reviewed and updated in 2029.

GRAPE CREEK DATA ANALYSIS UNIT

LOCATION

The Grape Creek Elk Data Analysis Unit is located in south central Colorado and comprised of Game Management Units (GMU's) 69 and 84 (Figure 5). It lies within portions of Custer, Fremont, Huerfano, and Pueblo Counties and is bounded on the North by U. S. Highway 50; on the east by Interstate 25; on the south and west by Colorado Highway 69 and Grape Creek.

Major drainages in E-28 include: The Arkansas River, Grape Creek, Huerfano River, Oak Creek, St. Charles River, Greenhorn Creek, Muddy Creek and Red Creek.

Landownership in E-28 includes: Colorado Parks and Wildlife 13.5 mi² (~1%), U. S. Forest Service 327 mi² (21%), Bureau of Land Management 59 mi² (4%), State Land Board 45 mi² (3%) and 1,104 mi² are in private ownership (70%; Figure 6). CPW currently possesses the recreational lease on ~4,070 ac (~6 mi²) of State Land Board property in E-28. These leased properties include Bear Gulch (640 ac) and Rosita (640 ac) in Custer County; Black Mountain (640 ac) and Blue Springs (640 ac) in Huerfano County; and Florence (640 ac), Grape Creek (~230 ac), Newlin Creek (640 ac), and West Bear Gulch (640 ac) in Fremont County.

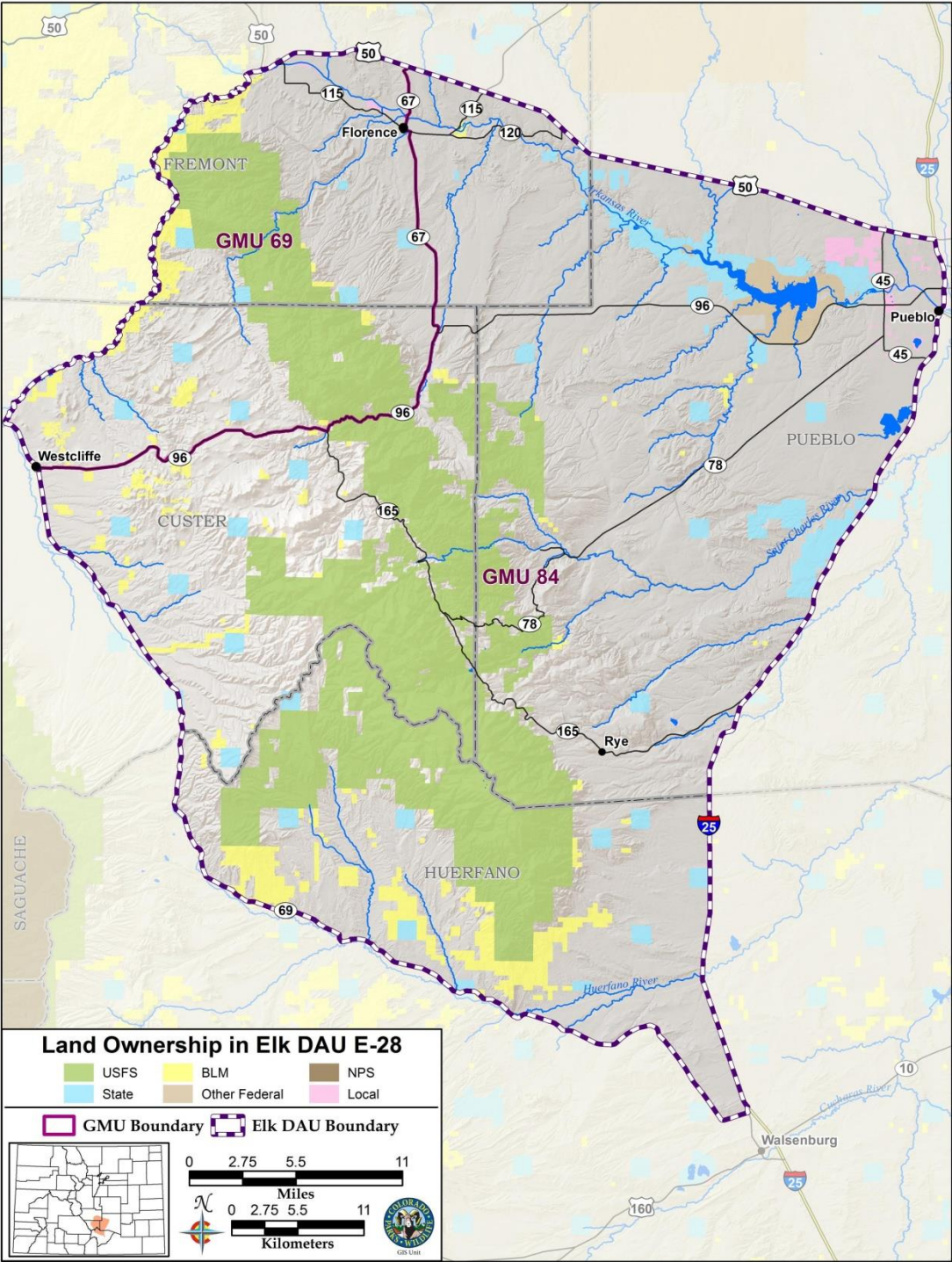


Figure 5. Land Ownership in Elk DAU E-28.

Approximately 83% of E-28 (1,309 mi²) is considered elk habitat. 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 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-28 could be influenced by hunting seasons. This seasonal migration generally begins in September and continues until January. Winter range is generally on windblown south and east facing slopes with exposed forage. Wintering concentrations of elk occur in the foothills along the Promontory Divide and Deer Peak area in GMU 84, while the grassland/shrub and ponderosa pine forests of GMU 69 contain most wintering elk in that unit (Figure 6). Migration back to summer range follows green up with elk dispersing to the overall range of the DAU in summer and fall.

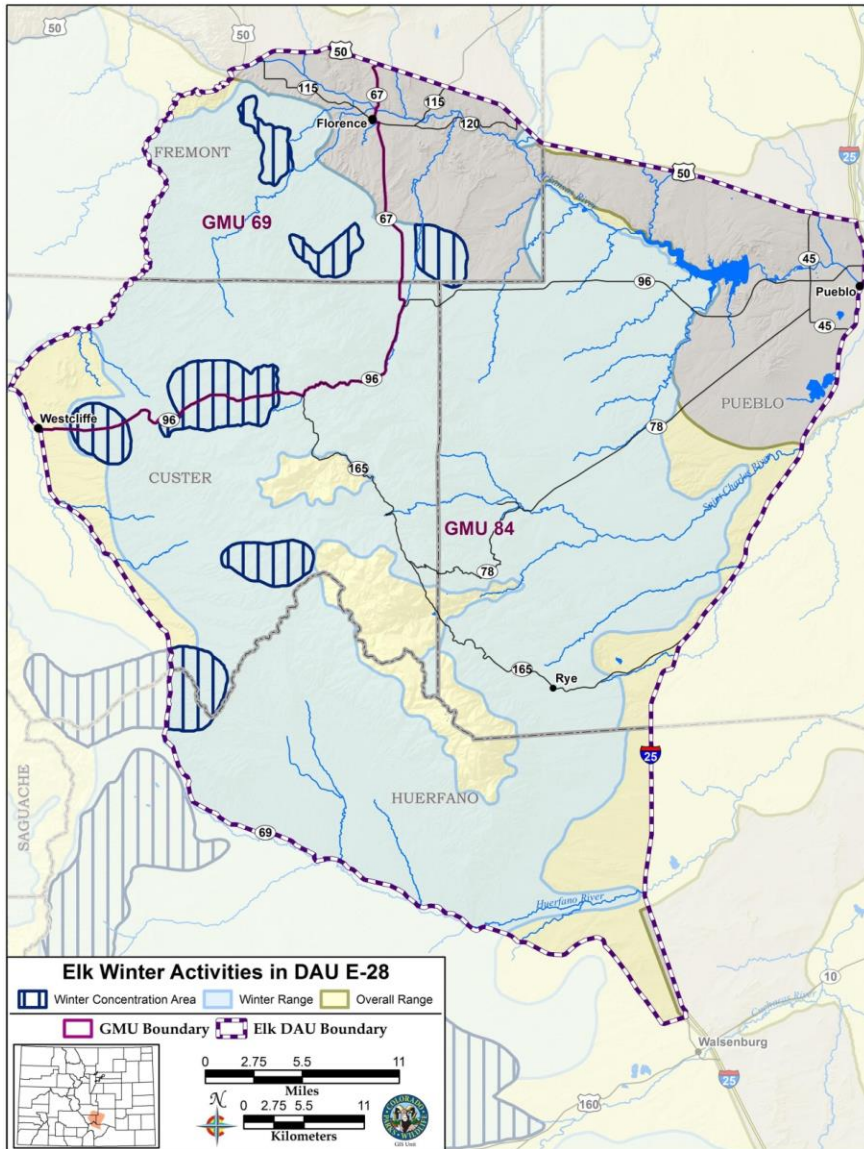


Figure 6. Elk Winter Range in DAU E-28.

HERD MANAGEMENT HISTORY

Aerial sex/age composition surveys for E-28 are available from 1983 to present. Initially, these surveys were conducted sporadically, depending on funding. However, in recent years the surveys are done annually. Starting in 2005, we increased survey efforts in E-28 and data

collection has remained consistent since that time. These surveys, conducted by helicopter, sample only a portion of the existing post-hunt population. Because of more accurate and consistent surveys, the E-28 population model is based upon the data collected from 2005 to present. 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 2005 and 2018, the average cow:calf ratio observed in E-28 was 35 calves:100 cows, with a high of 51 in 2005 to a low of 25 in 2017 (Figure 7). The bull:100 cow observed ratio averaged 41 bulls:100 cows, from a low of 20 in 2015, to a high of 57 in 2005. Again, it is generally accepted that observed bull:cow ratios are underestimates (Figure 8).

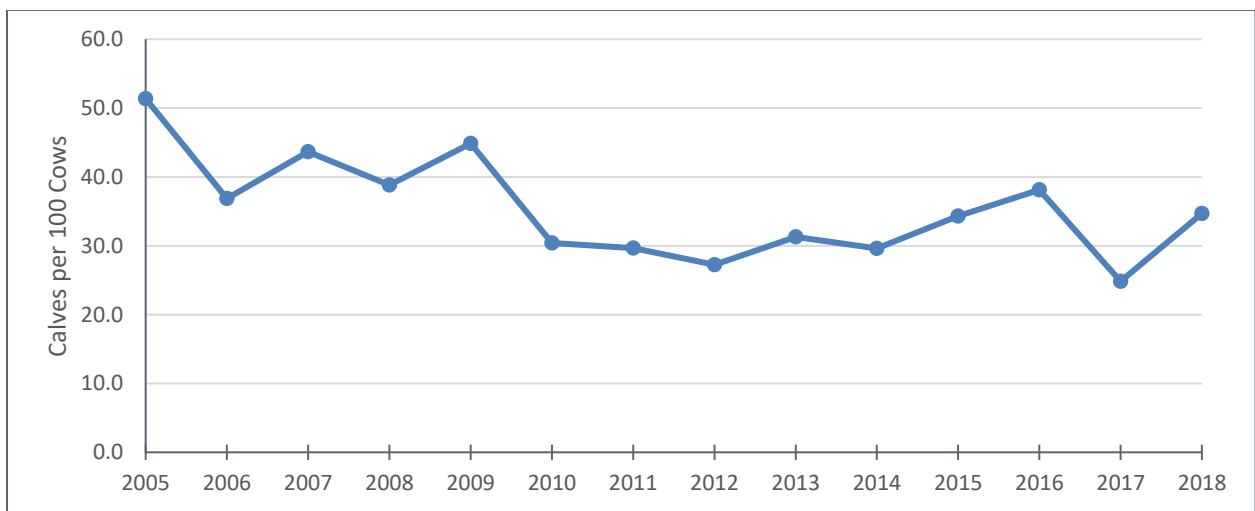


Figure 7. E-28 observed calves:100 cows, 2005-2018. Data are from annual post-hunt helicopter surveys.

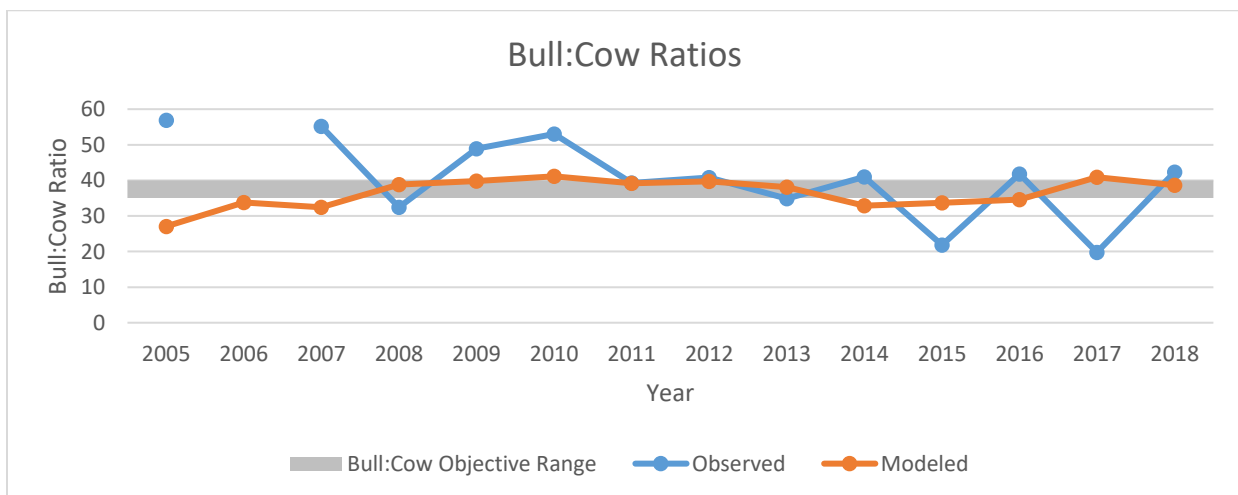


Figure 8. E-28 post-hunt observed and modeled bulls:100 cows & sex ratio objective limits, 2005-2018.

In 2005, the E-28 population objective was set at 1,450-1,650 elk. In 2005, the elk population was approximately 2,700 elk. The population increased to its high in 2008 and 2009 at an estimated 3,100 elk. The 2018 post-season population estimate for the Grape Creek herd was approximately 2,082 elk. Although the estimate is above the long-term objective of 1,400-1,600 elk, the estimated herd size has decreased since its high in 2009 (Figure 9).

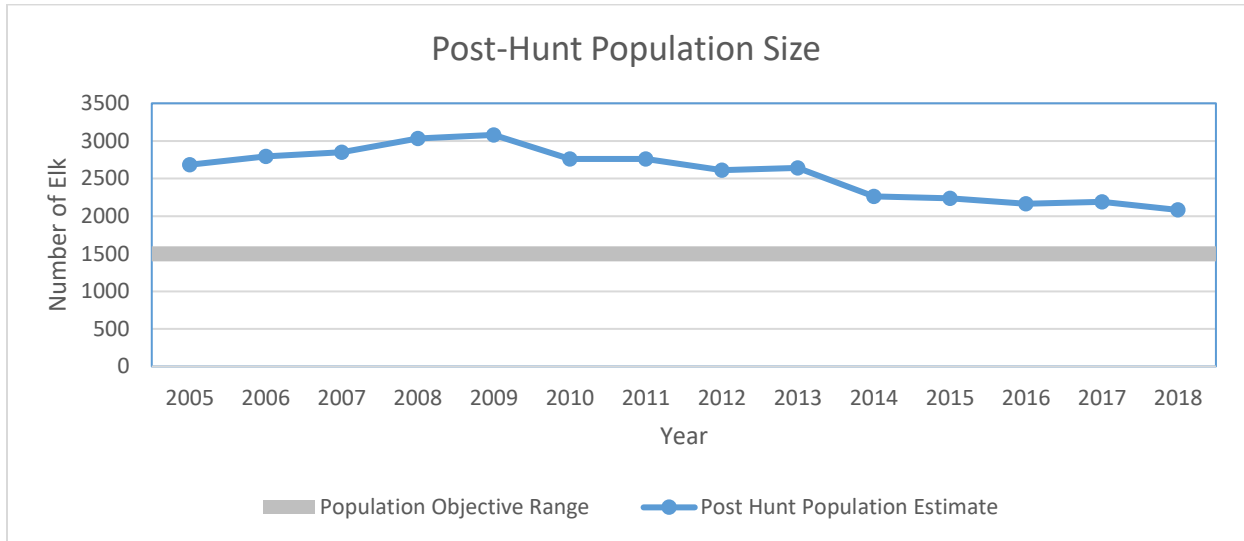


Figure 9. Elk DAU E-28 modeled posthunt population and objective range, 2005-2018.

The DAU has been limited for elk as far back as our records go, except for in 1982, when bull licenses were unlimited on an experimental basis. Antlerless licenses have been available since the 1960’s. In 2019, a total 1,325 licenses will be available in the drawing, including 777 antlerless, 325 antlered and 223 either-sex licenses. The DAU also has a number of licenses offered through the Ranching for Wildlife Program (RFW), which opened in 1989. In 2019, 3 either-sex and 17 antlerless licenses were offered through RFW on the Mountain Meadows Ranch in GMU 84.

GAME DAMAGE

Since 2007, CPW has paid a total of \$44,225.52 for ten elk game damage claims in E-28, all located in GMU 84 (Table 1). Nine of the claims were for damage to growing crops. The remaining claim, the most expensive at \$10,000, was paid for damage to harvested crops.

Table 1. Game damage claims paid from 2008-2018 in E-28.

Claim Date	Damage Type	Claim Paid	GMU
11/15/2008	Growing Crop	\$4,707.00	84
8/26/2010	Growing Crop	\$517.44	84
9/21/2011	Growing Crop	\$2,000.00	84
11/11/2011	Growing Crop	\$6,165.50	84
1/13/2013	Harvested Crop	\$10,000.00	84
1/13/2013	Growing Crop	\$2,000.00	84
12/22/2015	Growing Crop	\$4,500.00	84
12/11/2016	Growing Crop	\$4,742.00	84
12/18/2017	Growing Crop	\$2,318.58	84
12/19/2018	Growing Crop	\$7,275.00	84

HARVEST

Elk harvests have changed dramatically over time in this DAU, with about 3.5 times as many elk being killed in 2016 (420) than in 1988 (124; Figure 10). Harvest from 1988 to 2018 ranged from a low of 124 elk in 1988, to a high of 420 elk in 2016. From 1988 to 2004, bull harvest has averaged 104, with a low of 63 in 2001 and a high of 157 in 1996. Between 2005 to 2018, the average harvest of bulls has been 148, with a low of 106 in 2005 and a high of 185 in 2011. Annual success rates have varied from a low of 19% in 2001 to a high of 37% in 2012. Success rates have averaged 28% between 1988 and 2018 (Figure 11).

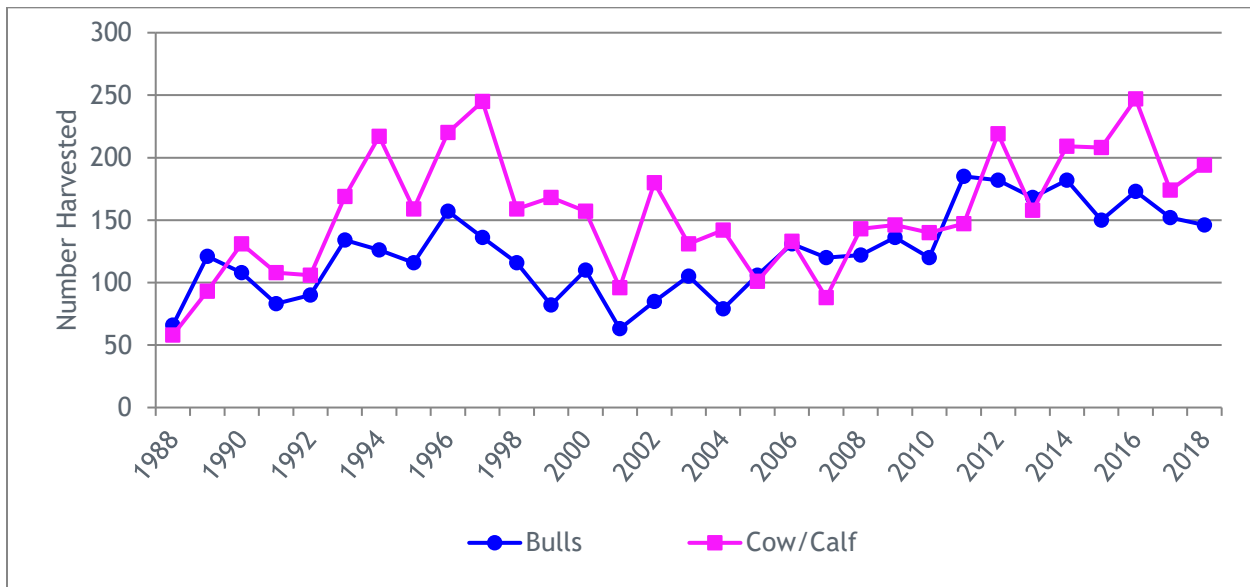


Figure 10. Elk harvest in DAU E-28, 1988-2018. Harvest is for all manners of take.

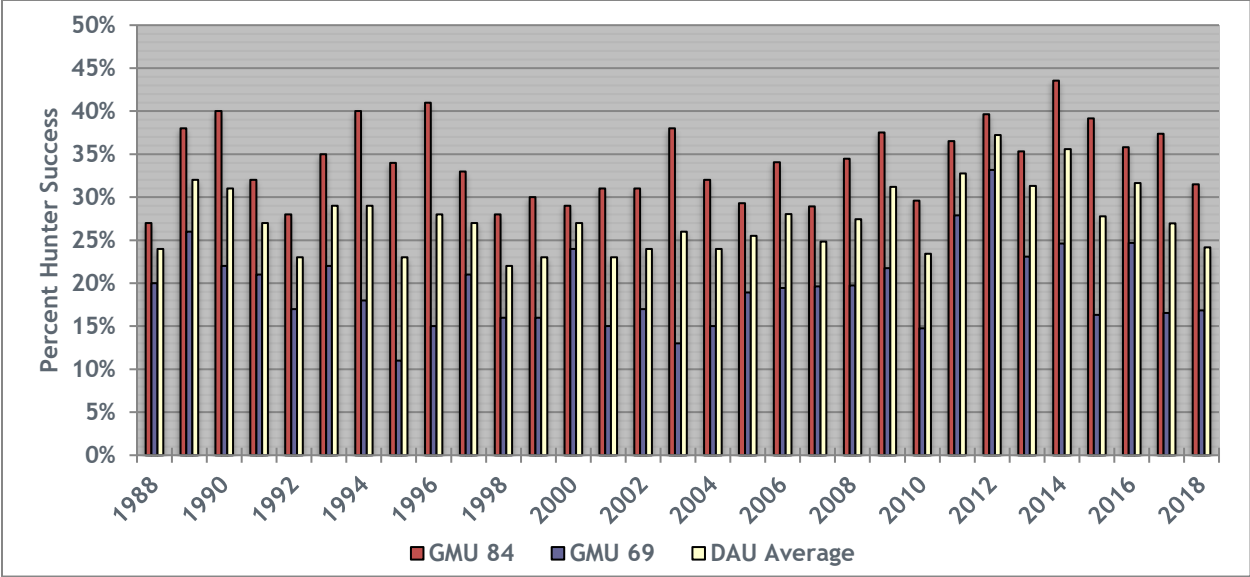


Figure 11. Hunter success for all manners of take by GMU and DAU for elk DAU-28, 1988-2018. Hunter success is defined as the total number of elk harvested divided by the total number of hunters.

HUNTER NUMBERS

The number of hunters per year for all seasons between 1988 and 2018 ranged from a low of 519 in 1988 to a high of 1,550 in 1997. The increase in the hunter pressure from the mid to late 1990's is a result of the additional antlerless licenses aimed at reducing the population towards objective. Between 2007 and 2018, on average, 1106 hunters participated yearly in all methods of take in the DAU (Figure 12).

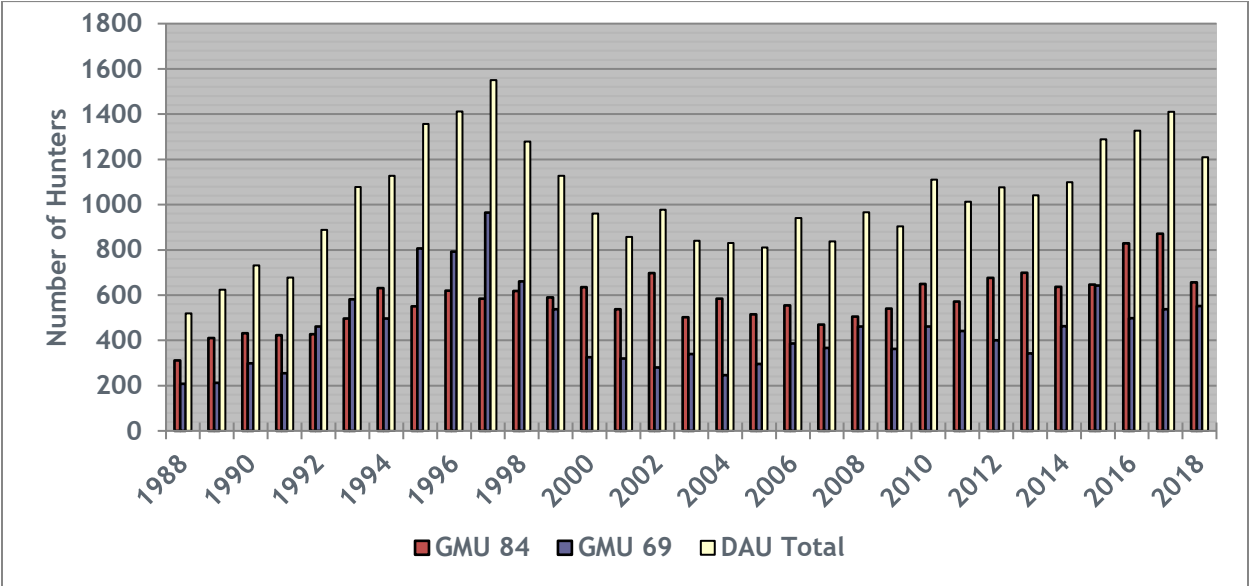


Figure 12. Total number of estimated hunters by GMU and DAU for elk DAU E-28, 1988-2018.

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.

To solicit landowner input, we used county records to identify individuals with parcels >35 ac. From that list, we randomly selected 777 landowners and mailed them a survey booklet with a pre-paid return envelope. Two hundred fifteen (215) landowners replied to the survey. A summary of the results of the landowner survey are found in Appendix A.

We sampled 1,690 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 269 responses. A summary of the results of all the hunter questionnaires are in Appendix B.

The majority of landowners and hunters supported an increase in the elk population objective for E-28, with 56% of landowners and 72% of hunters indicating they would like to see a slight or moderate increase in elk. Thirty-seven percentage (37%) of landowners indicated that the current elk population is acceptable (Figures 13 & 14).

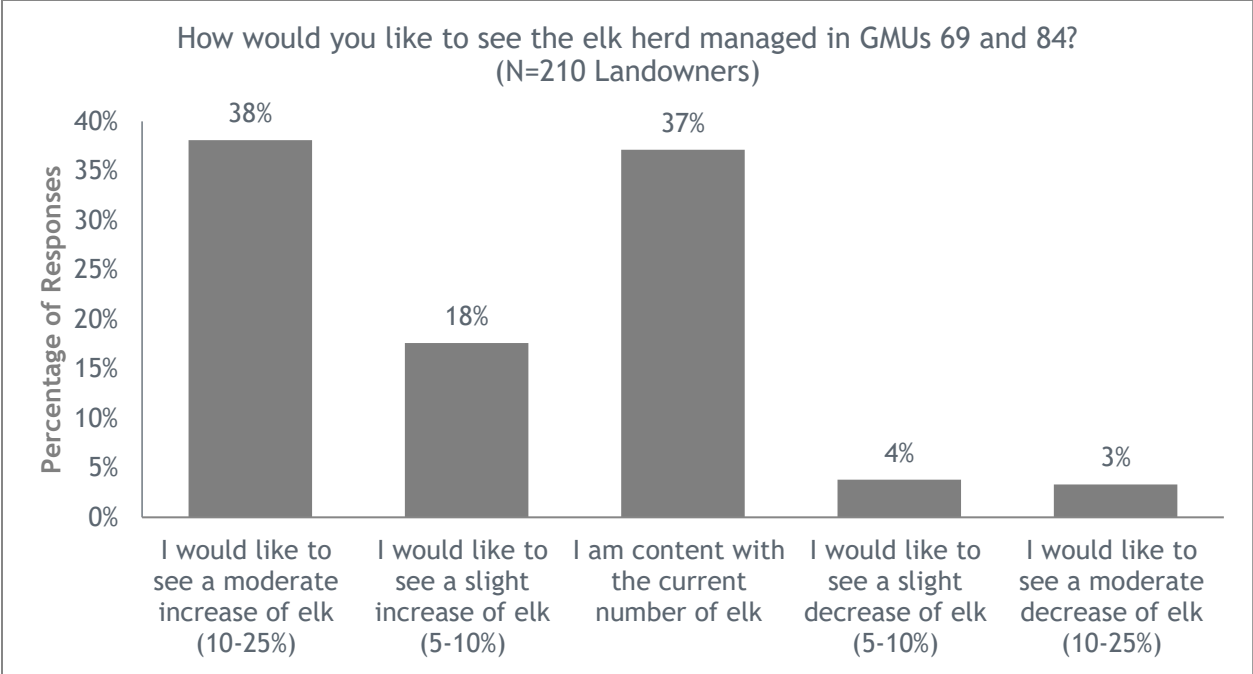


Figure 13. Percentage of responses to the question asking landowners how they would like to see the elk herd managed in elk DAU E-28. See Appendix A.

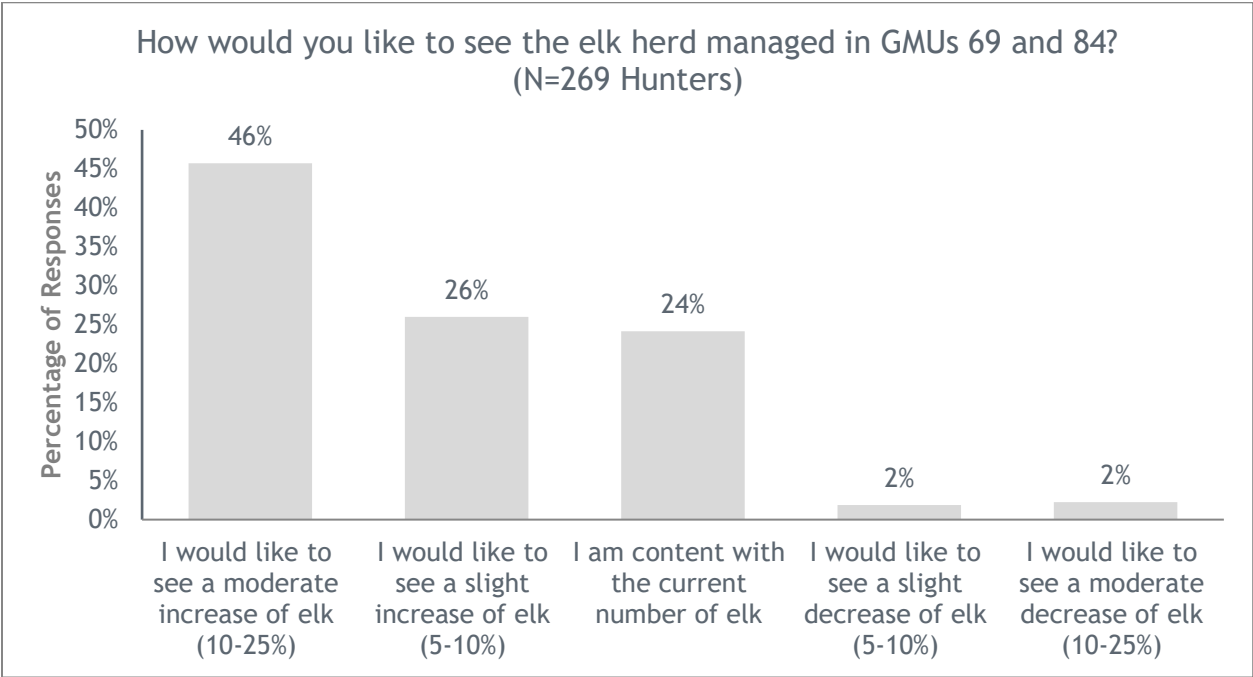


Figure 5. Percentage of responses to the question asking hunters how they would like to see the elk herd managed in elk DAU E-28. See Appendix B.

When asked about how bull harvest should be managed, results were mixed. To address this question, we asked landowners and hunters whether they would prefer having: 1) fewer licenses and more bulls, 2) more licenses and less bulls, or 3) the same number of licenses/same number of bulls. Additionally, we gave them the option of responding Not Sure and Other. Landowners were divided, with 31% indicating they would prefer having fewer licenses and 38% indicating they would prefer having more licenses (Figure 15). Nine percent (9%) of landowners wanted the same number of licenses. Forty-two percent (42%) of hunters indicated that they would like to see more licenses, resulting in a decrease in the number of bulls in the population (Figure 16). Thirty-seven percent (37%) of hunters preferred having the same number or fewer licenses.

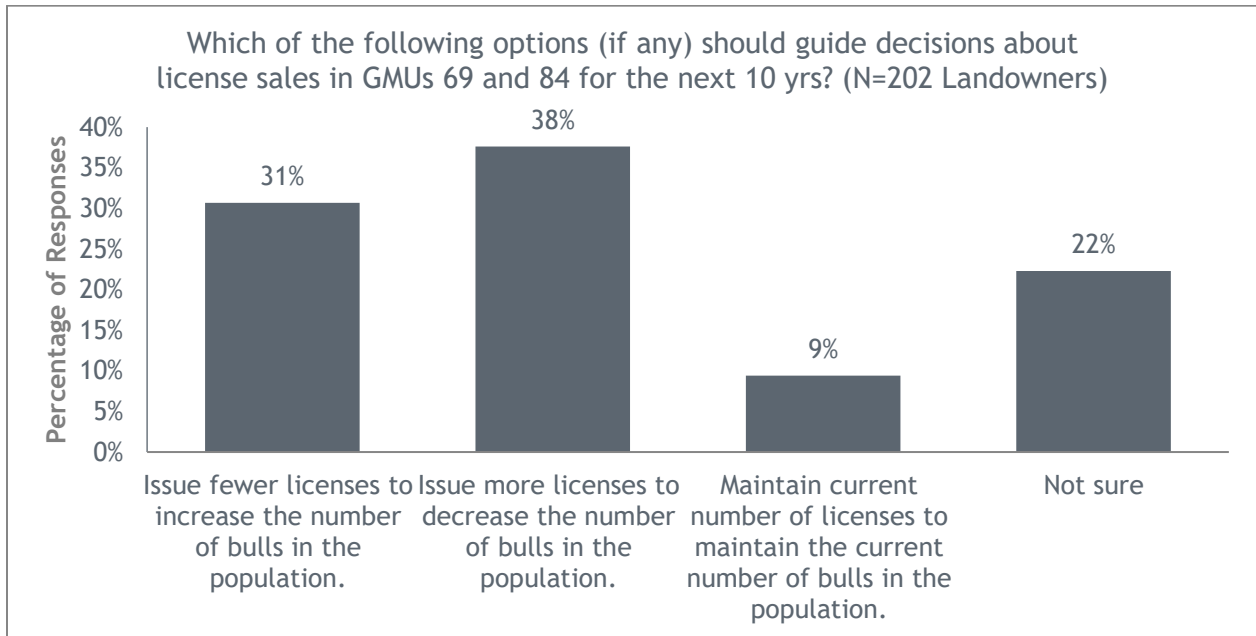


Figure 15. Question 14 from landowner survey asking how bull harvest should be managed in DAU E-28. There were no “Other” responses to this question.

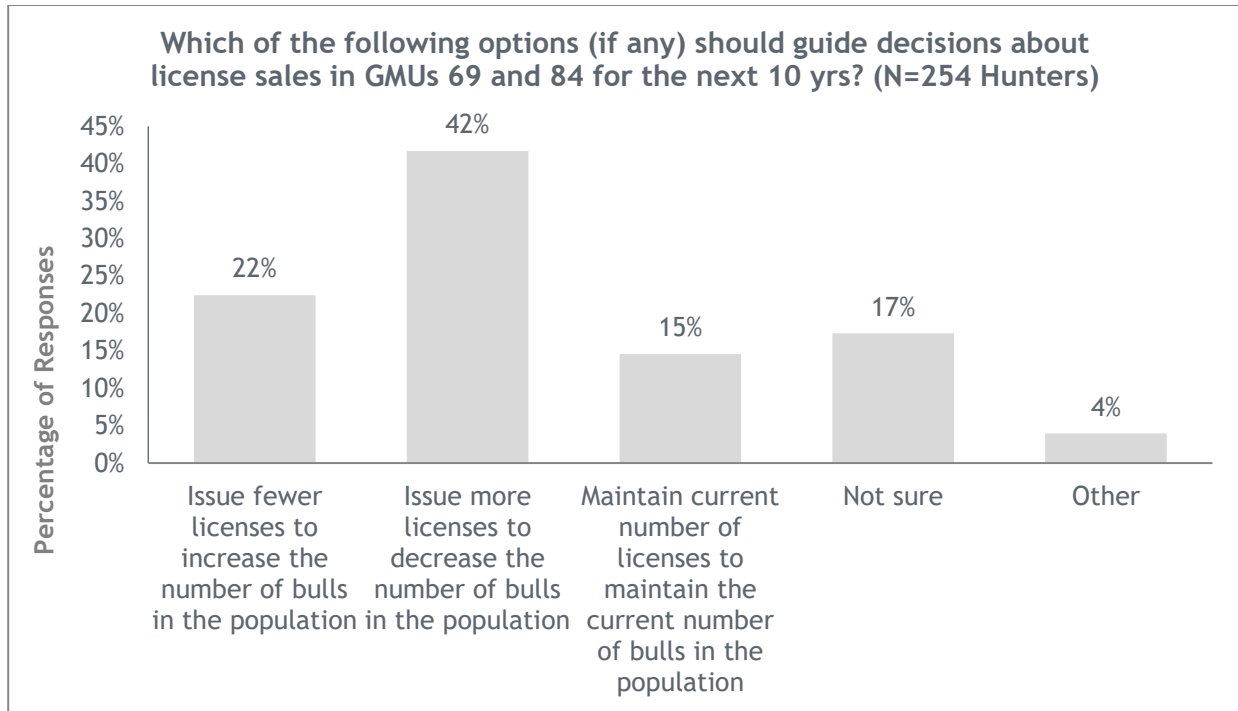


Figure 16. Question 14 from hunter survey asking how bull harvest should be managed in DAU E-28.

ISSUES AND CONCERNS

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

1. Elk taking refuge on private lands - This is becoming a greater problem throughout the west as large ranches are increasingly being leased to outfitters, being subdivided and prohibit hunting or are owned by absentee landowners. 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 become more pronounced as the hunting seasons progress. CPW tries to encourage hunting on all private lands but does not have ultimate control. In E-28, agricultural producers 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.
2. Housing development - During the last several decades low density housing developments have reduced the available elk habitat in E-28 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-28 was among the highest level of development in Colorado (refer to the area marked D-34 in Figure 17). Given that

the population in Colorado is expected to increase from 5.8 million people in 2019 to 8.1 million by 2050 (<https://demography.dola.colorado.gov/population/>), this trend is expected to be one of the main areas of concern for managers, both with trying to maintain elk populations and allowing population management on an increasingly developed landscape. It is important to remember that the past population objective was set to mitigate elk damage to growing crops, and as the value of elk have increased landowner tolerance has changed.

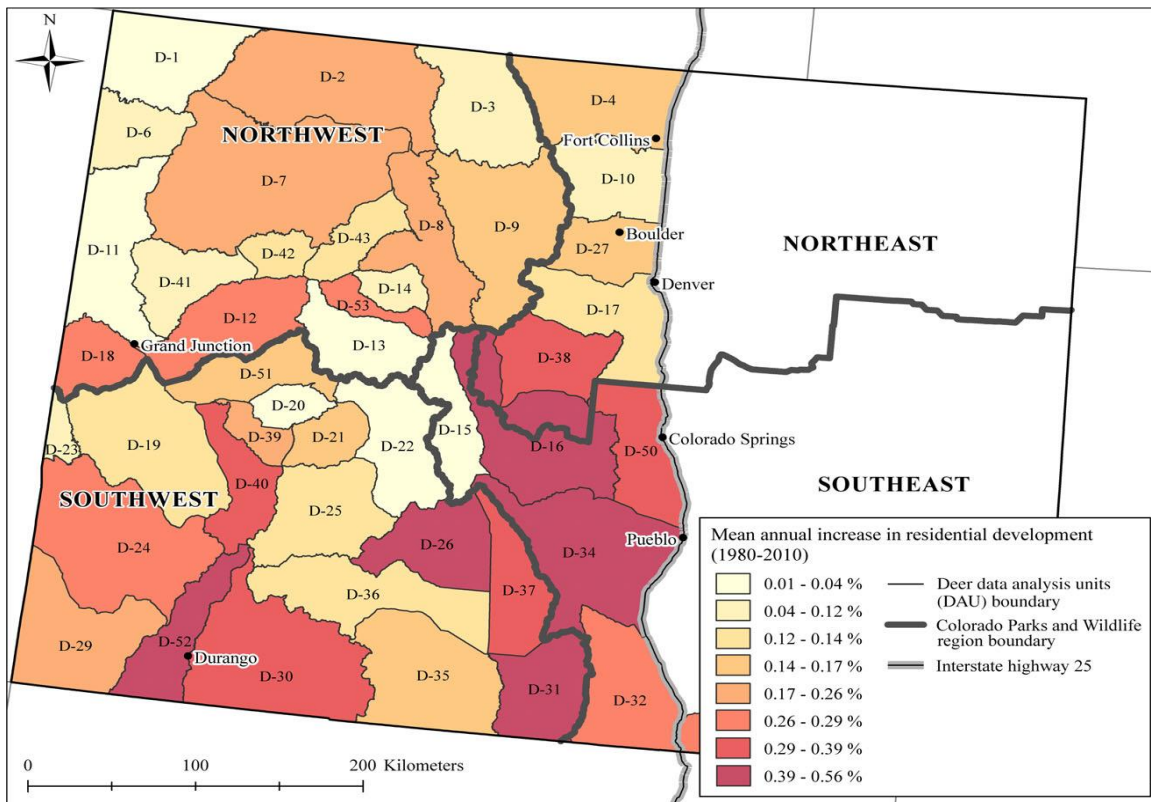


Figure 17. Map of deer data analysis units (DAUs) and regions in Colorado designated by Colorado Parks and Wildlife, and the percent increase in human population from 1980-2010 (Johnson et al. 2016). Elk DAU E-28 overlaps with the eastern portion of Deer DAU D-34.

3. Hunting access: Hunters were concerned about lack of hunting access, since approximately 70% of the DAU is in private ownership. Access across or upon private land is difficult to obtain.
4. Damage to fences - Twenty-nine percent (29%) of landowners said that elk use impacted their property, with 76% of those respondents indicating that elk caused damage to their 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. Declining calf/cow ratios - CPW and the Parks and Wildlife Commission (PWC) have identified declining calf/cow ratios as a concern throughout southern Colorado. Like in other DAUs, over the past 14 years, we have seen an overall declining trend in the observed calf/cow ratio in E-28 (Figure 18).

7. 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.

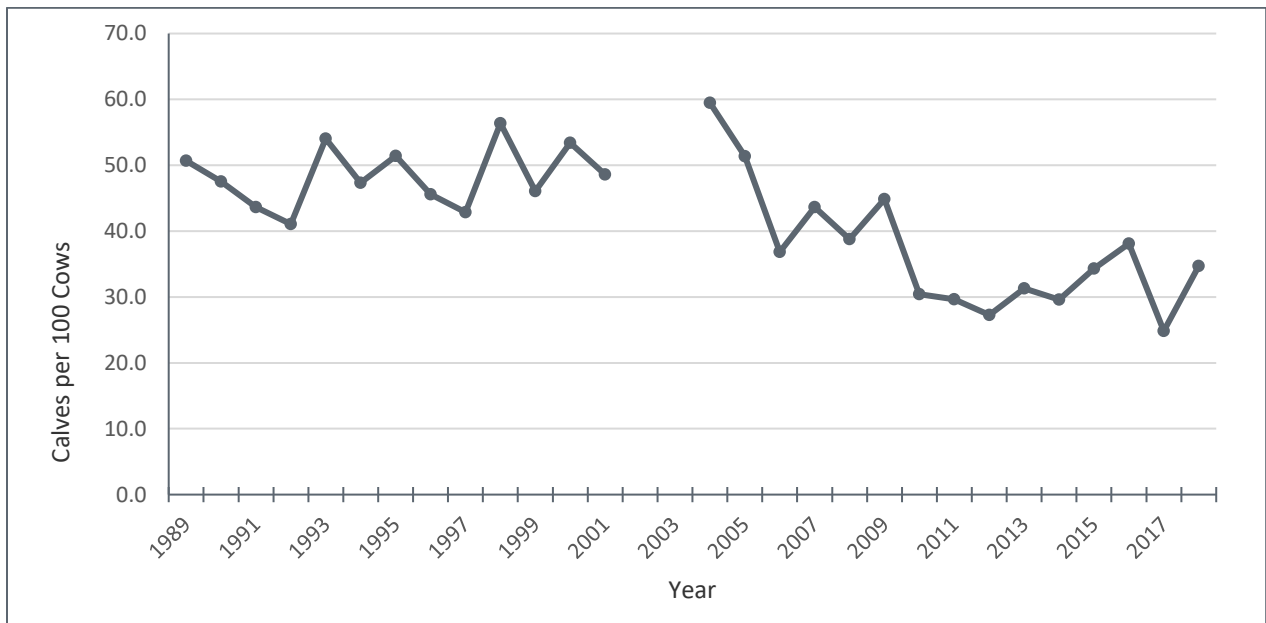


Figure 18. Observed calf/cow ratios in elk DAU E-28, 1989-2018.

ALTERNATIVE DEVELOPMENT

Management Alternatives and Preferred Objectives

The primary focus of this plan is on developing management alternatives for population size and sex ratio objectives.

Population Objective

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 1,400-1,600, 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 1,400-1,600 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.

Alternative 2: Increase the population objective to 1,800-2,200 elk.

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. 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.

Alternative 3: Increase the population objective to 2,400-2,800 elk. (Approved objective)

This alternative is approximately 25% above the 2018 posthunt population estimate and is 73% above the midpoint of the existing (2007) objective. Based on our survey responses, stakeholders support an increase in the elk population. Since the current elk population size is below this range, we would need to reduce antlerless harvest in the short term to achieve this objective. At these higher population levels, we would need to monitor game damage in the unit, which might require additional dispersal licenses to address concerns.

Herd Composition (Bull:100 Cow Ratio)

The historic objective of 35-40 bulls per 100 cows, approved in 2007, was set based on the existing bull:cow ratio at the time the 2007 plan was developed. References below are based on the 2018 modeled post-hunt sex ratio of 38.6 bulls:100 cows.

Alternative 1 (Status Quo): 35-40 bulls per 100 cows (Approved objective)

The current bull:cow ratio is within this range, and we are currently managing the population to maintain this objective. Therefore, we would not anticipate significant changes to bull licenses under this alternative. This would be a compromise between the stakeholders who indicated they preferred more, less, or the same number of bull licenses in the unit.

Alternative 2: 30-35 bulls per 100 cows

The midpoint of this alternative would represent a 16% decrease in the ratio of bulls per 100 cows from the current (2018) posthunt modeled ratio. To achieve this objective, we would increase the number of bull licenses. This management strategy was supported by 38% of landowners and 42% of hunters. This would result in additional opportunity, but we would expect the age-class and size of bulls to decrease under this alternative.

PUBLIC COMMENT PERIOD

Outreach efforts

After proposing the three population and two sex ratio 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 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 and use existing HPP and Game Damage programs for landowners that are experiencing elk conflicts that cannot be addressed through the general hunting seasons on an individual basis. Additionally, we will continue to look for opportunities for hunter access on or through private property.

Elk habitat in E-28 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.

There have been improvements to elk habitat in the DAU since the last plan was approved. Several fires have burned within E-28. In 2016, the Beulah Hill Fire burned 5,232 ac and the Junkins Fire burned 18,761 ac. These fires have improved the areas within the burn scar and are causing shifts in elk distribution from surrounding areas. Changes in the high elevation habitat due to a spruce die-off and wind-blown trees are holding the elk on the public lands

slightly longer. This has drastically increased habitat quality in these areas, especially on summer range.

There is currently a study in E-33, to the south of E-28, 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

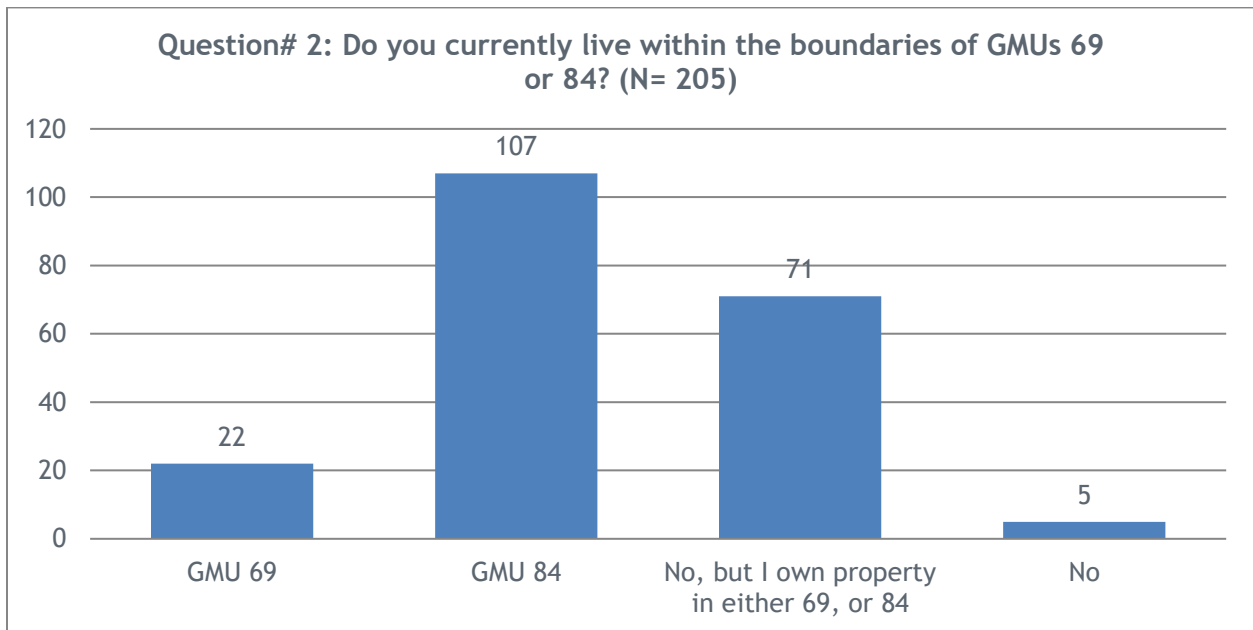
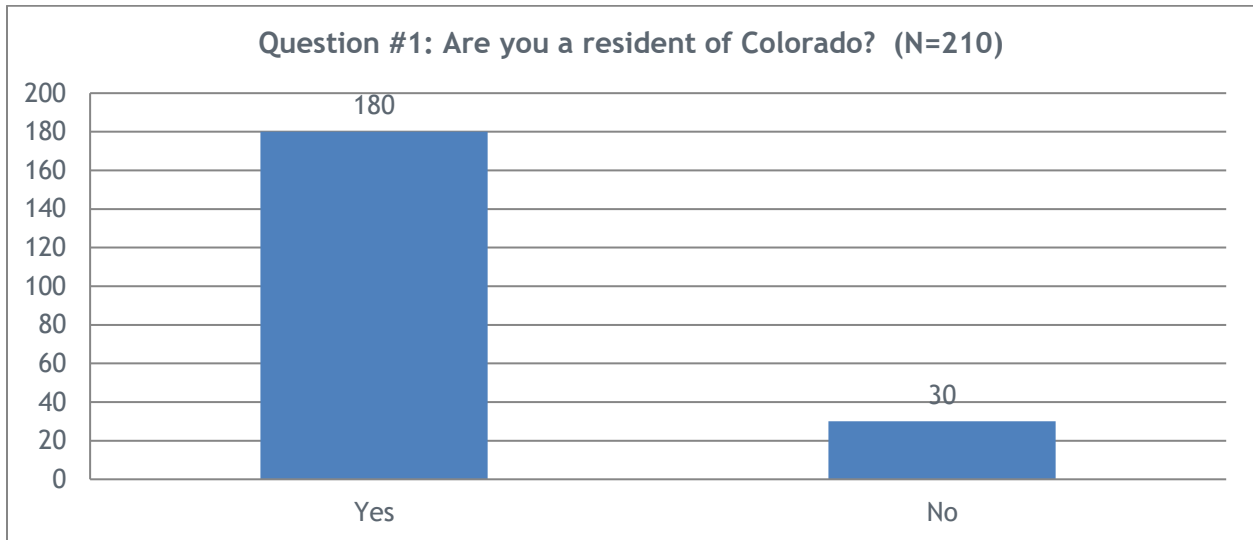
The current elk population size (2,082 elk) and sex ratio (38 bulls per 100 cows) are within the ranges for the respective three alternatives, so we would expect to maintain current or slightly lower license levels depending on which alternative is selected. To manage for Population Alternative 1, additional antlerless harvest would be necessary, which has been unobtainable with current seasons. Population Alternative 3 would necessitate a reduction in antlerless licenses. At higher population sizes, elk damage might increase. To manage for a lower bull/cow ratio, bull licenses would need to be increased, resulting in additional opportunity. However, the age-class and size of bulls might decrease under Composition Alternative 2.

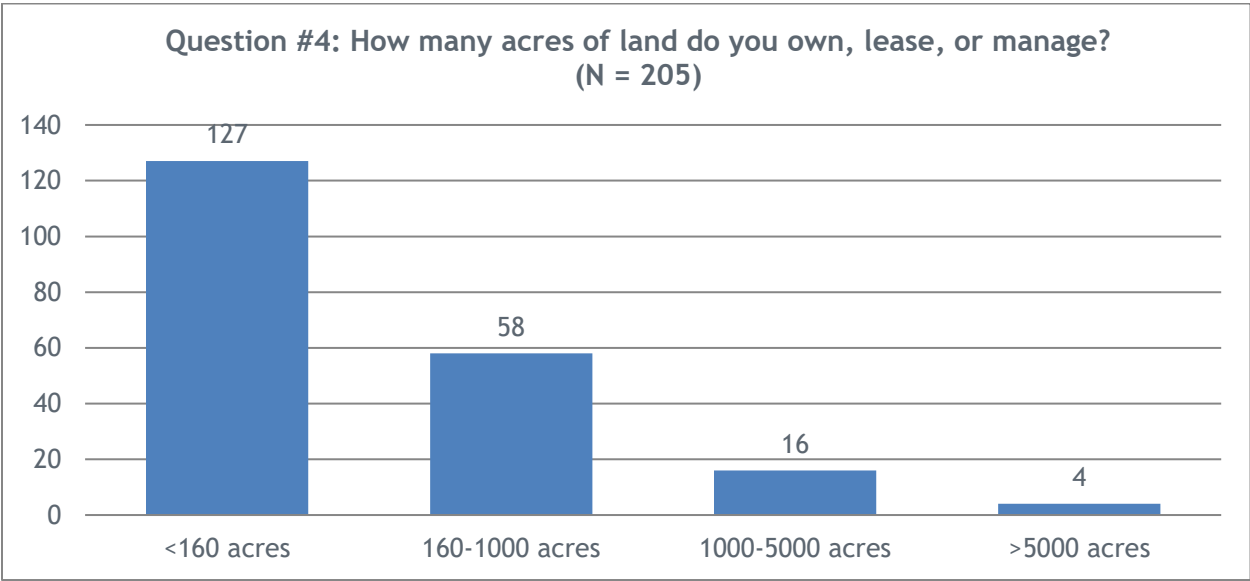
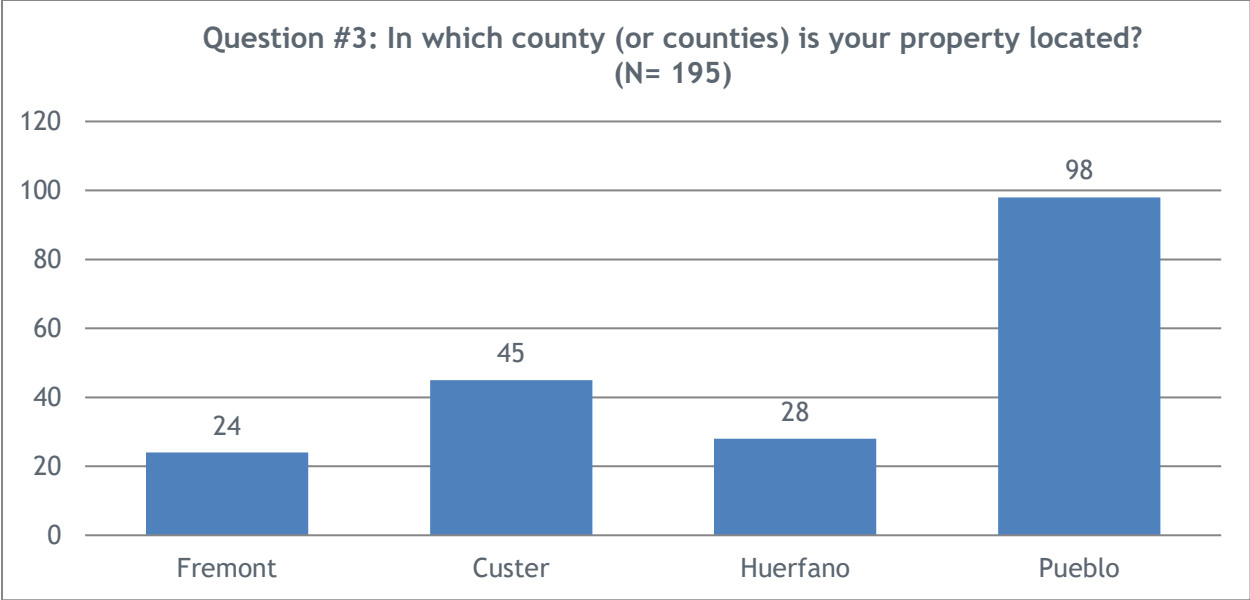
LITERATURE CITED

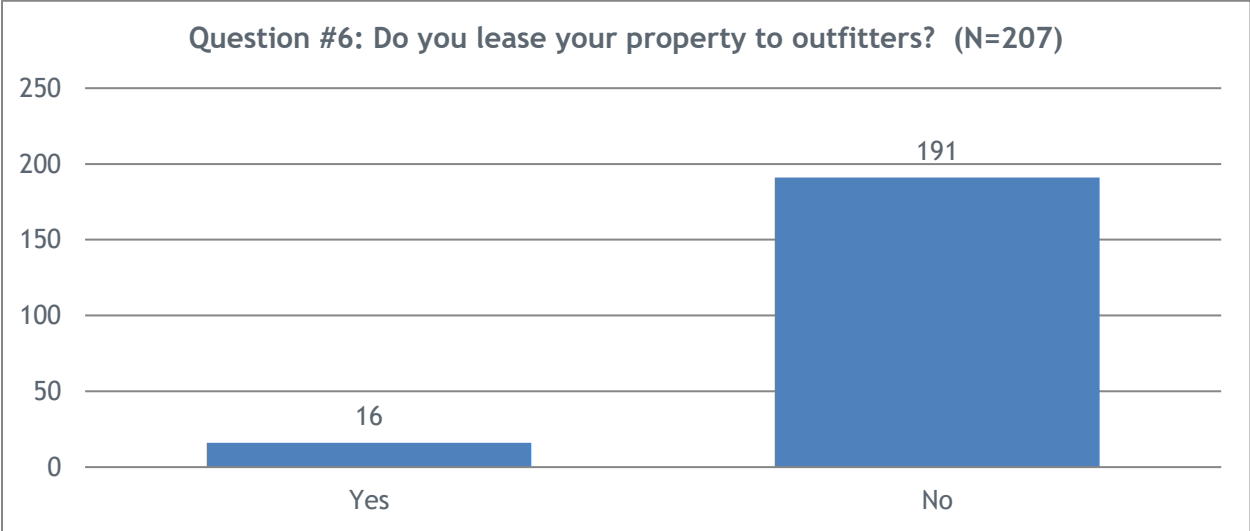
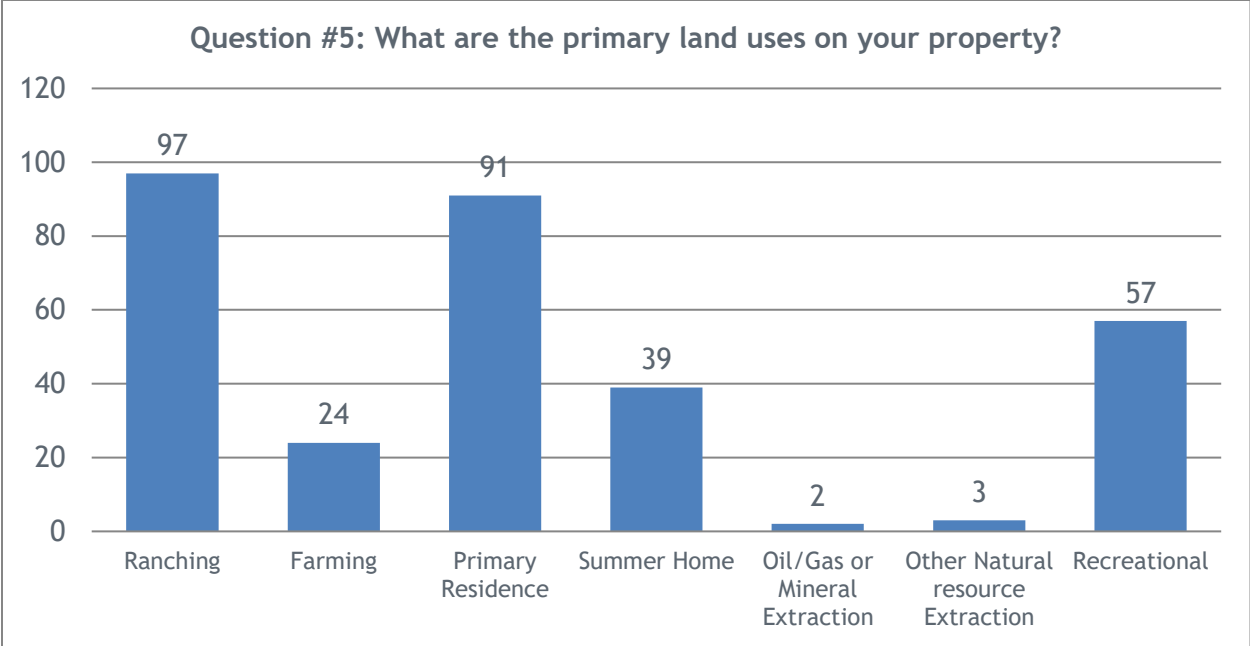
- Johnson, H. E., J. Sushinsky, A. Holland, E. J. Bergman, T. Blazer, J. Garner and S. E. Reed (2016) Increases in residential and energy development are associated with reductions in recruitment for a large ungulate. *Global Change Biology*. 23:578-591.
- Mikle, N. L., T. A. Graves, and E. M. Olexa. 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.

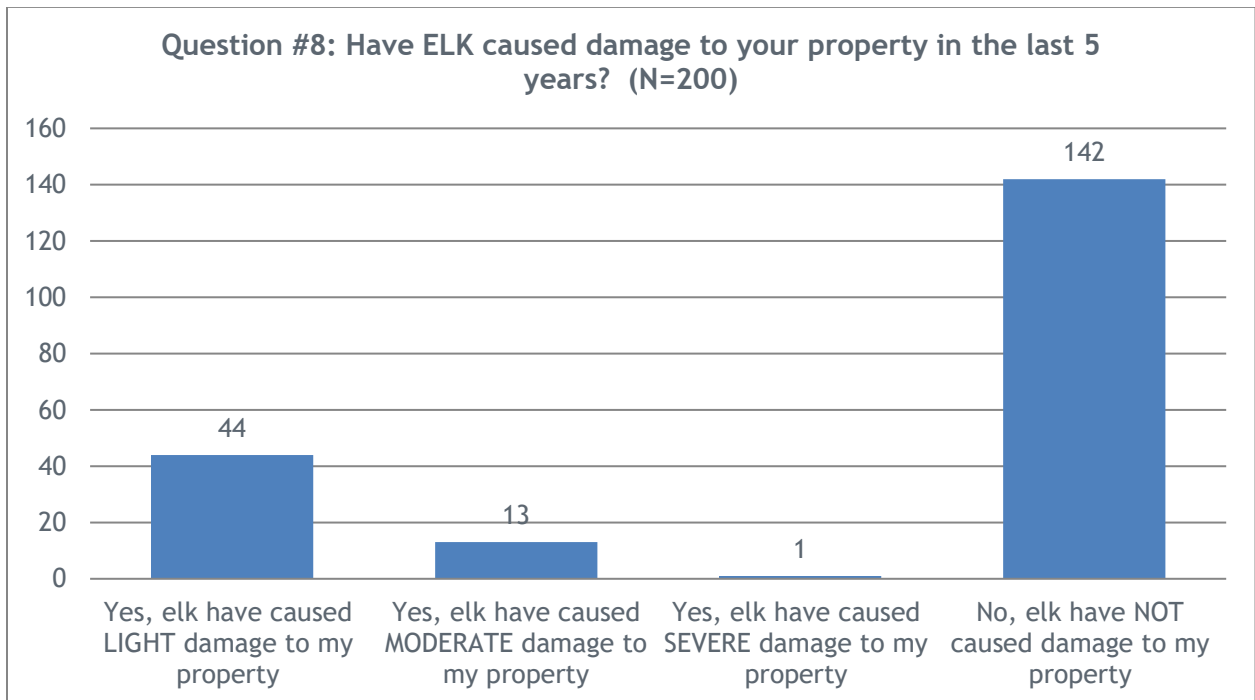
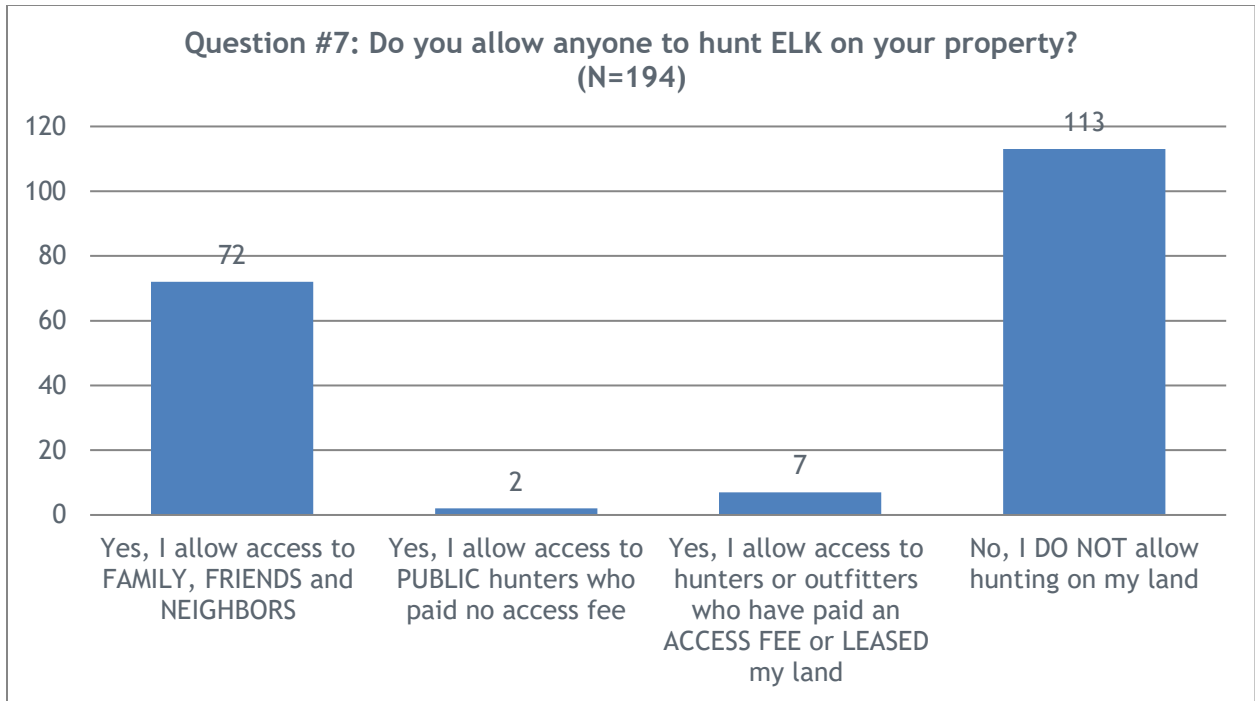
Appendix A: 2017 Landowner Questionnaire Results

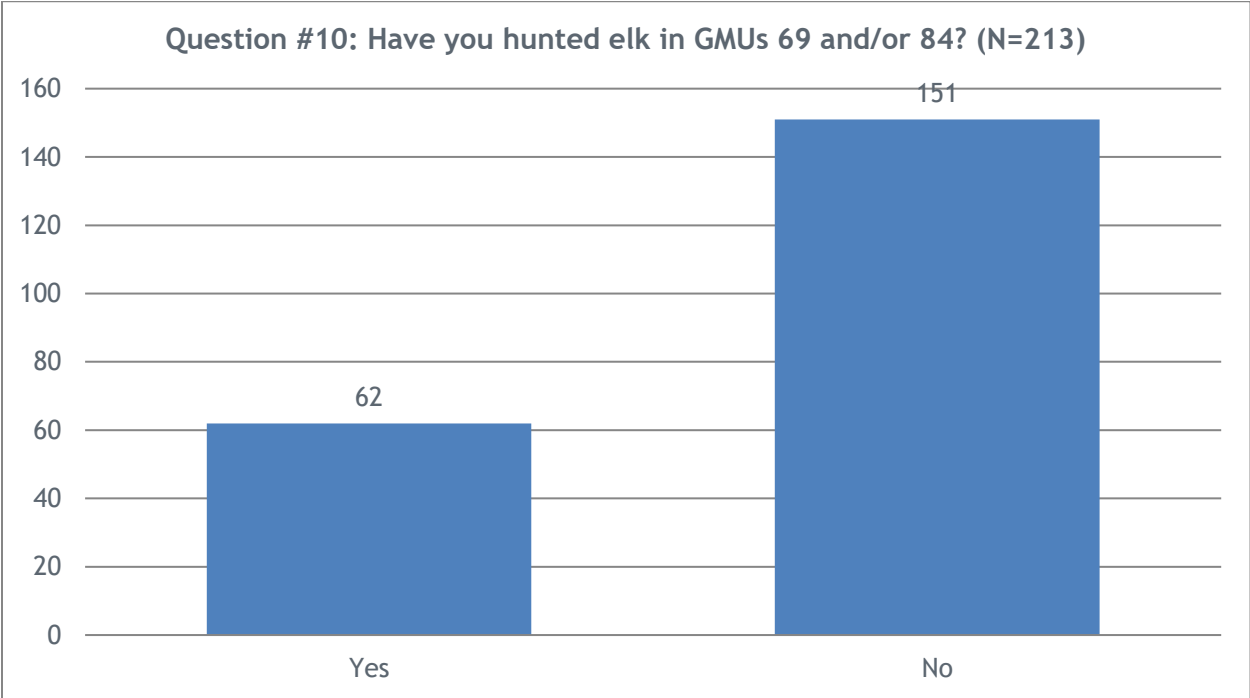
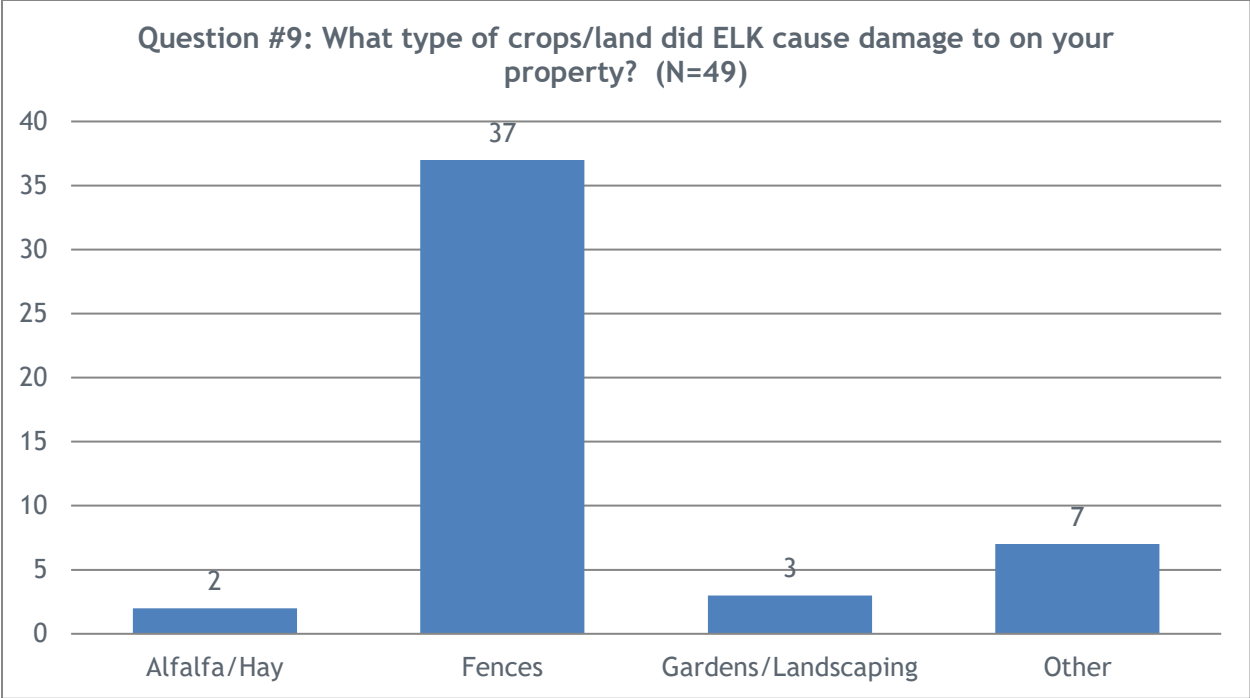
In September of 2017, we mailed 777 surveys to landowners that owned property in E-28. Landowners were selected at random if they owned more than 35 ac within the DAU. If selected, landowners were sent a paper survey and asked to return the survey in a prepaid return envelope. The survey contained 18 questions. Of the 777 surveys sent out, we received responses from 215 landowners, which represent a 28% response rate.



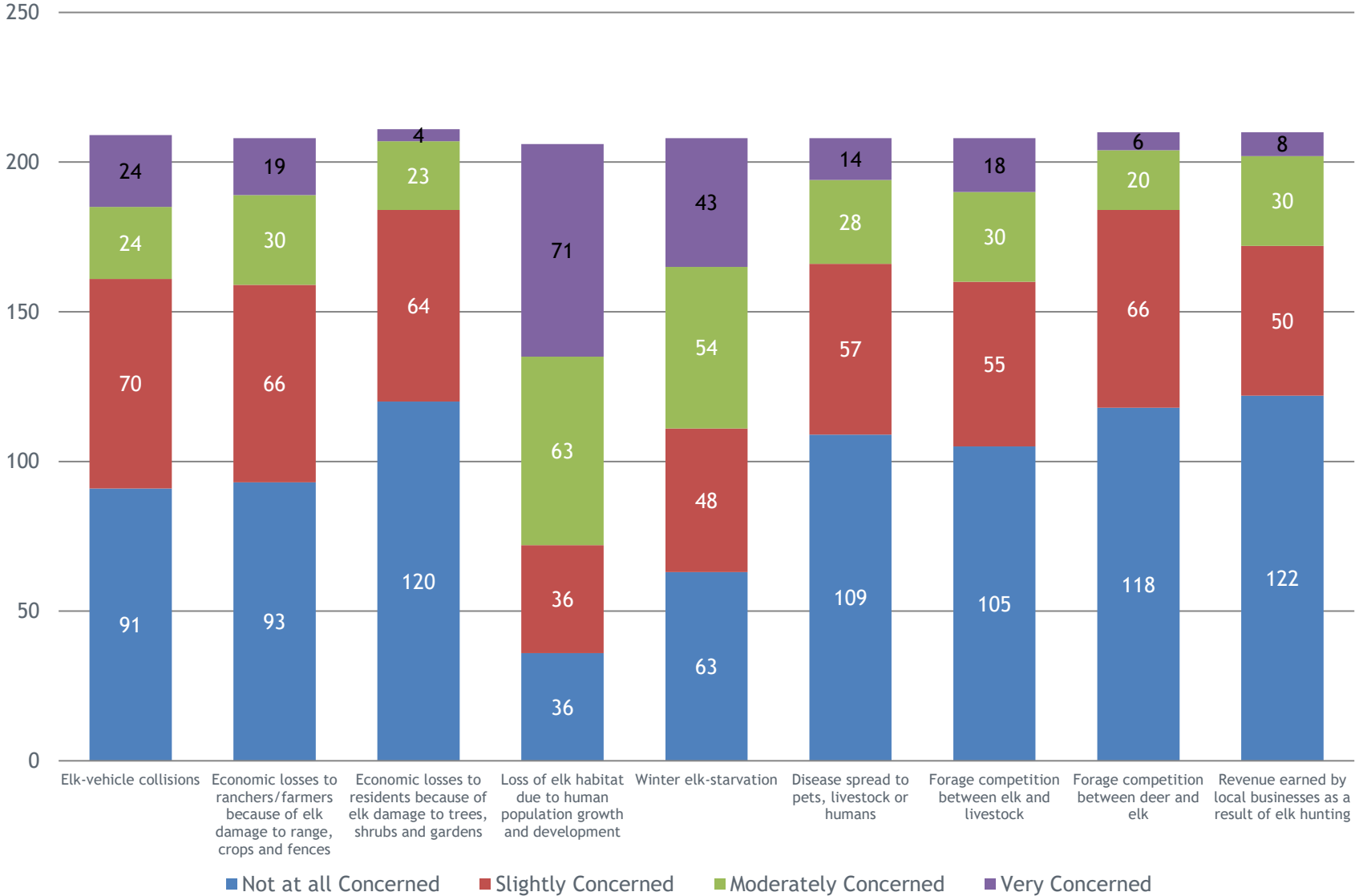


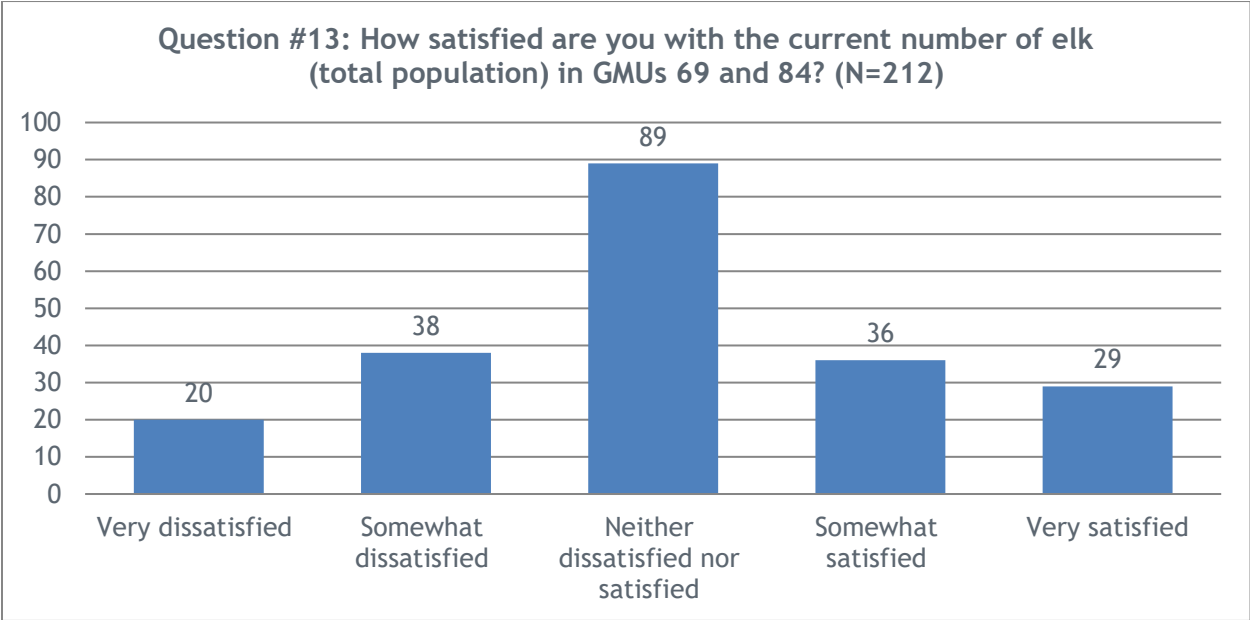
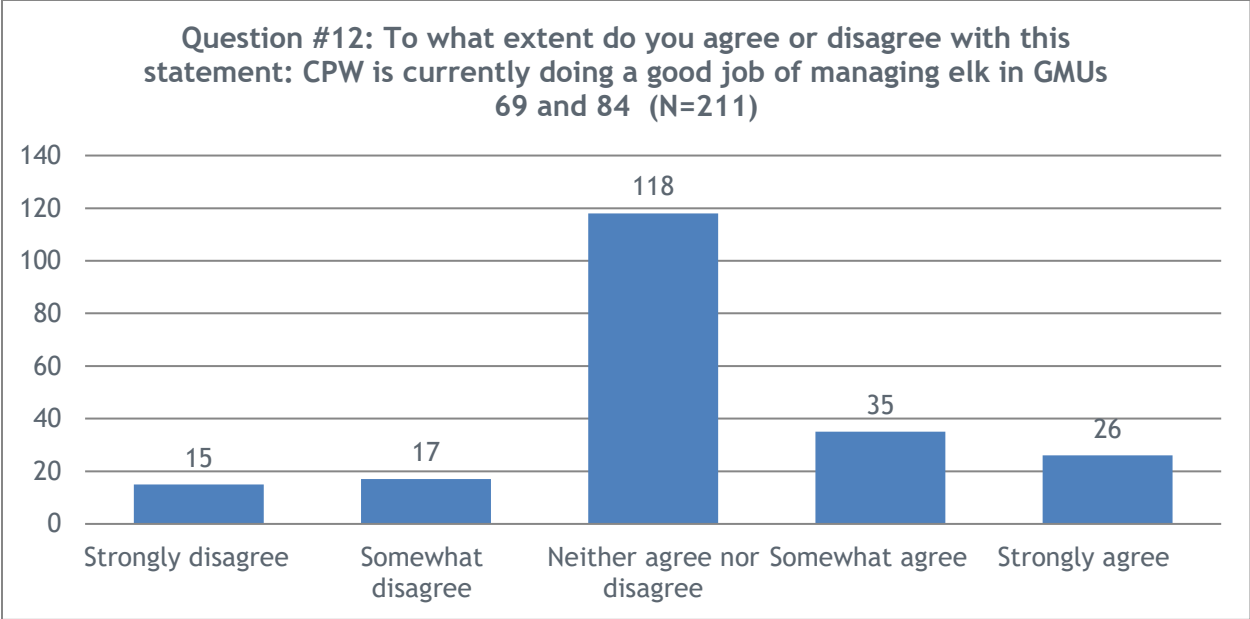


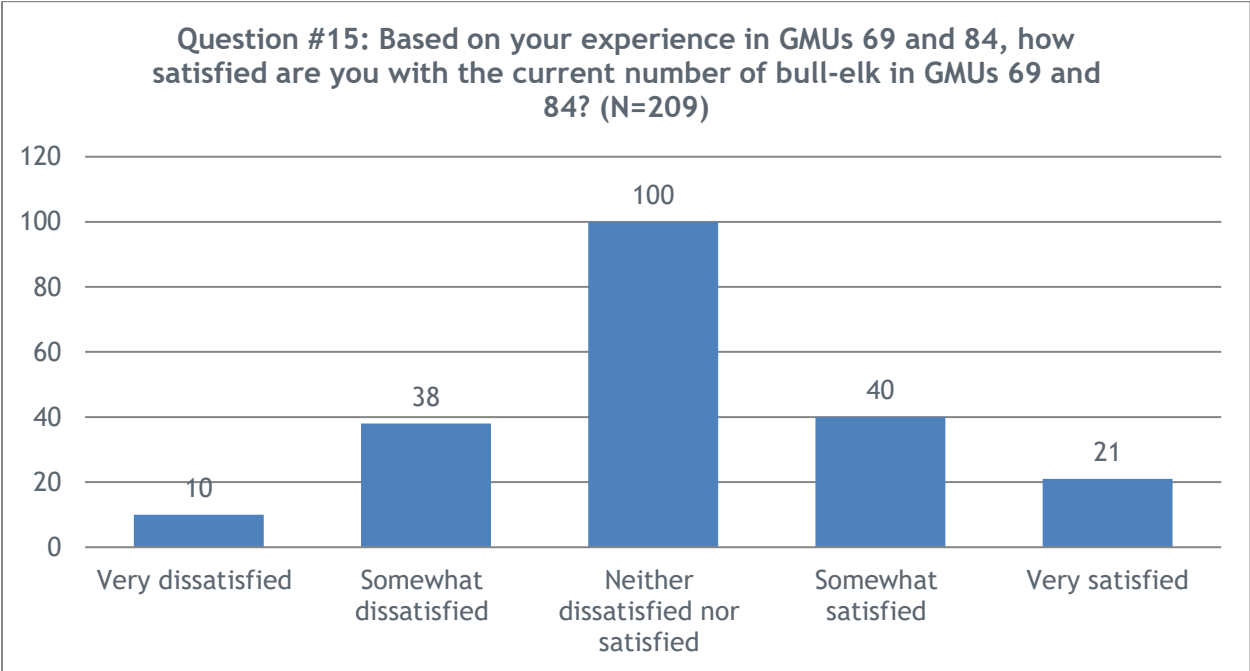
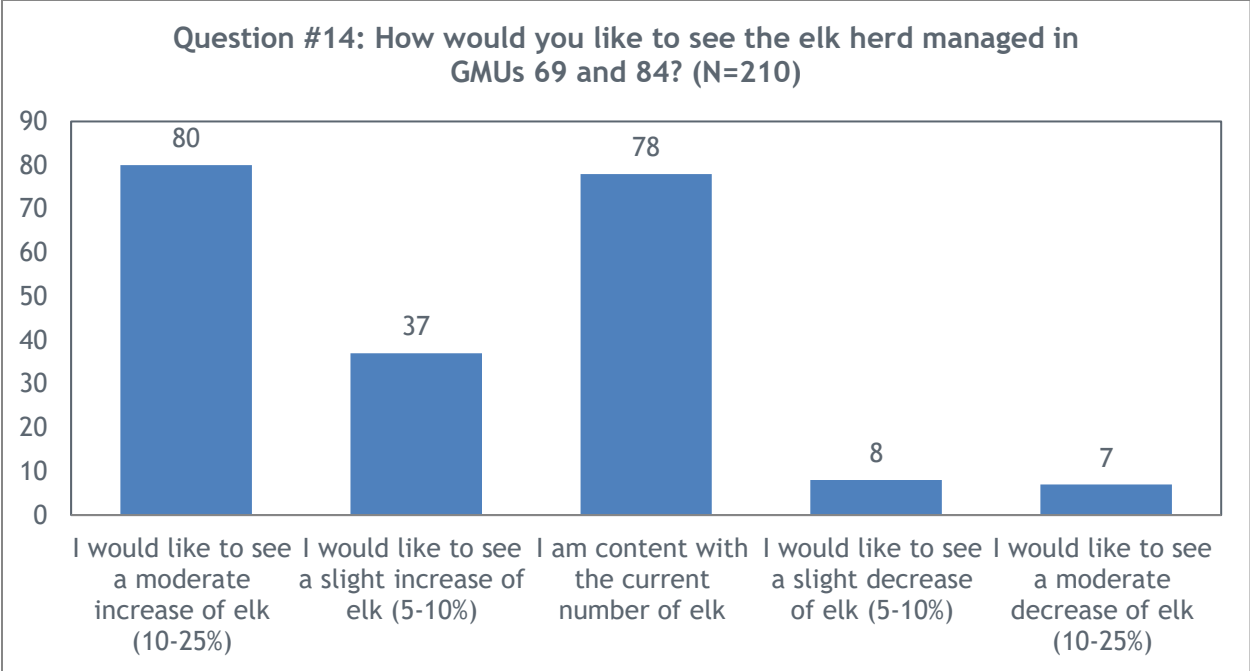


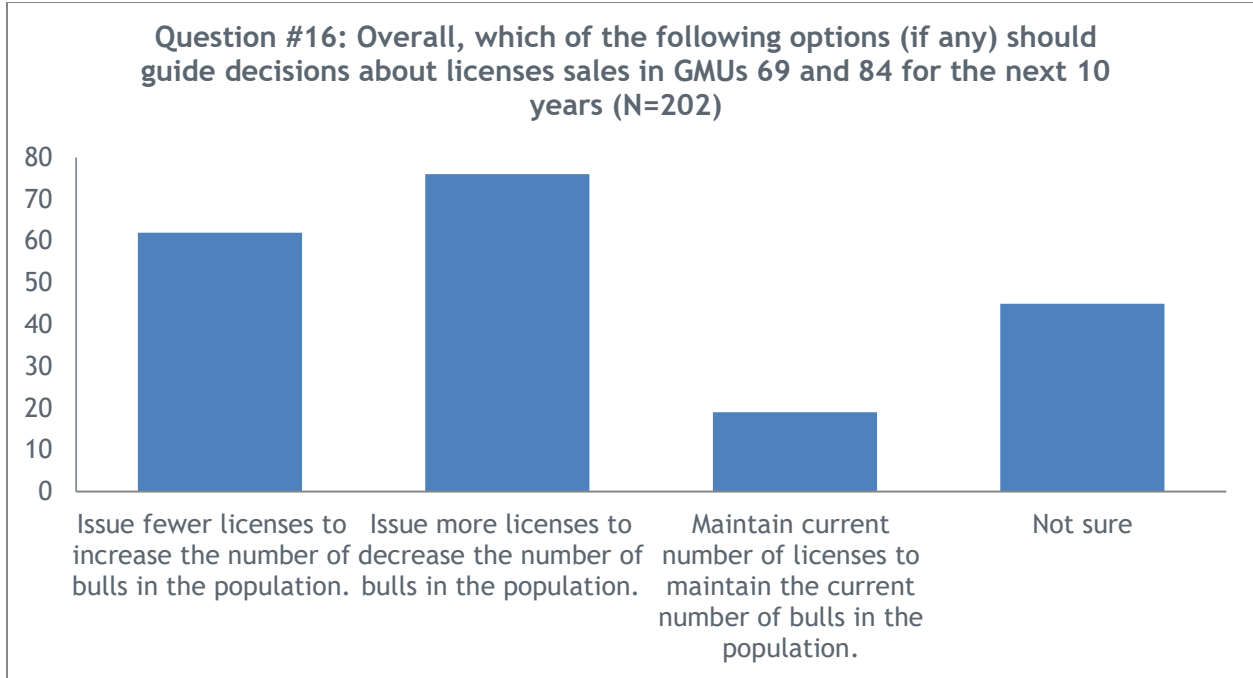


Question 11: The following is a list of possible concerns that people may have with elk in GMUs 69 and 84. How concerned are you about each of the following? (N=211)









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

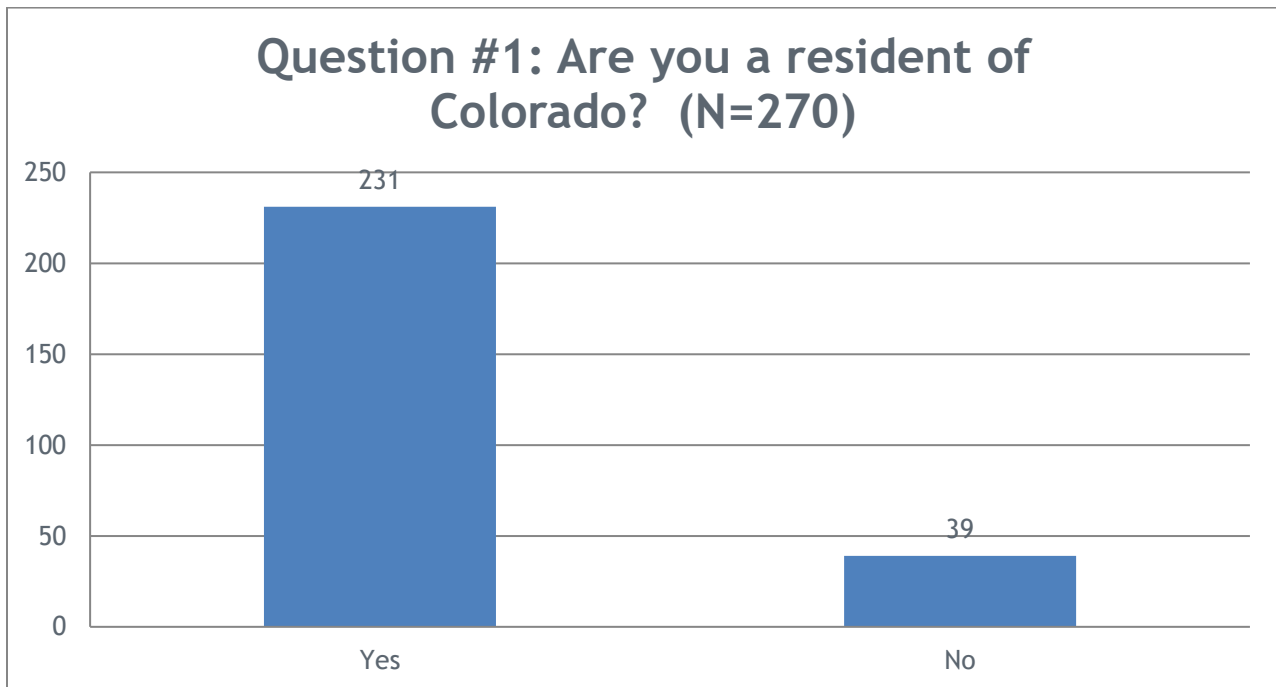
- WOULD LIKE TO SEE MORE ELK: 9 COMMENTS
- THINGS ARE CURRENTLY WORKING: 7 COMMENTS
- TOO MANY DEER: 6 COMMENTS
- TOO MUCH HUMAN DEVELOPMENT: 5 COMMENTS
- ISSUE MORE LANDOWNER LICENSES: 5 COMMENTS
- COMPLAINTS ABOUT HUNTING/HUNTERS: 4 COMMENTS
- WOULD LIKE TO SEE BETTER HUNTER ACCESS: 3 COMMENTS
- TOO MANY LANDOWNER TAGS: 2 COMMENTS
- WOULD LIKE TO SEE MORE BULL LICENSES: 1 COMMENT
- WOULD LIKE TO SEE MORE COW LICENSES: 1 COMMENT
- TOO MANY ELK: 1 COMMENT
- TOO MANY MOUNTAIN LIONS: 1 COMMENT

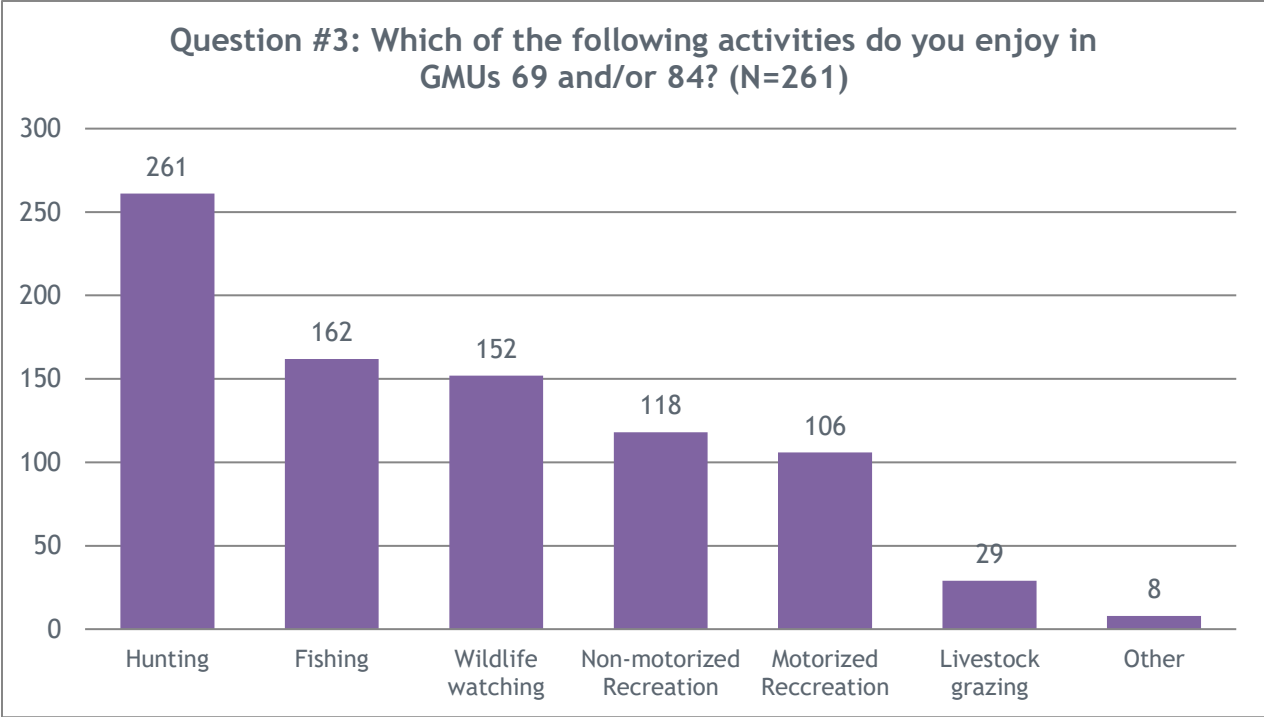
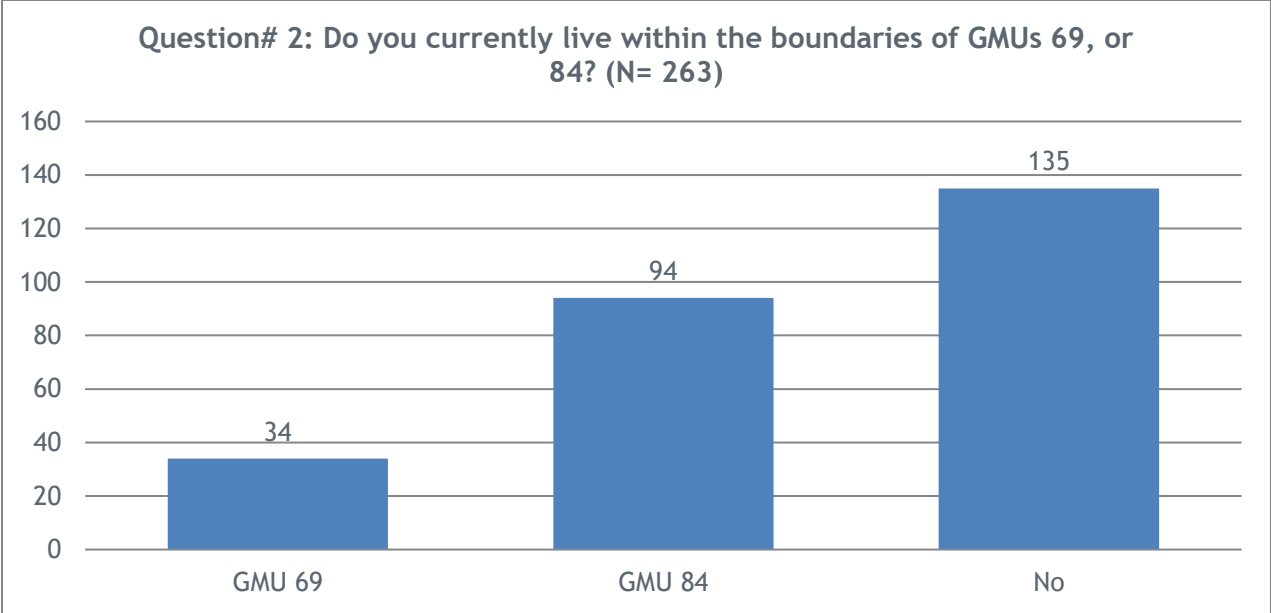
Appendix B: 2017 Hunter Questionnaire Results

In September of 2017, we conducted a survey of hunters in E-28 using two different methods. First, we mailed hard copy surveys to 845 hunters that had applied to hunt in E-28. Hunters were asked to fill out the survey and return it in a prepaid return envelope. Second, we mailed 845 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 217 mailed in surveys. For the online survey, we received 53 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 the responses from both survey methods.

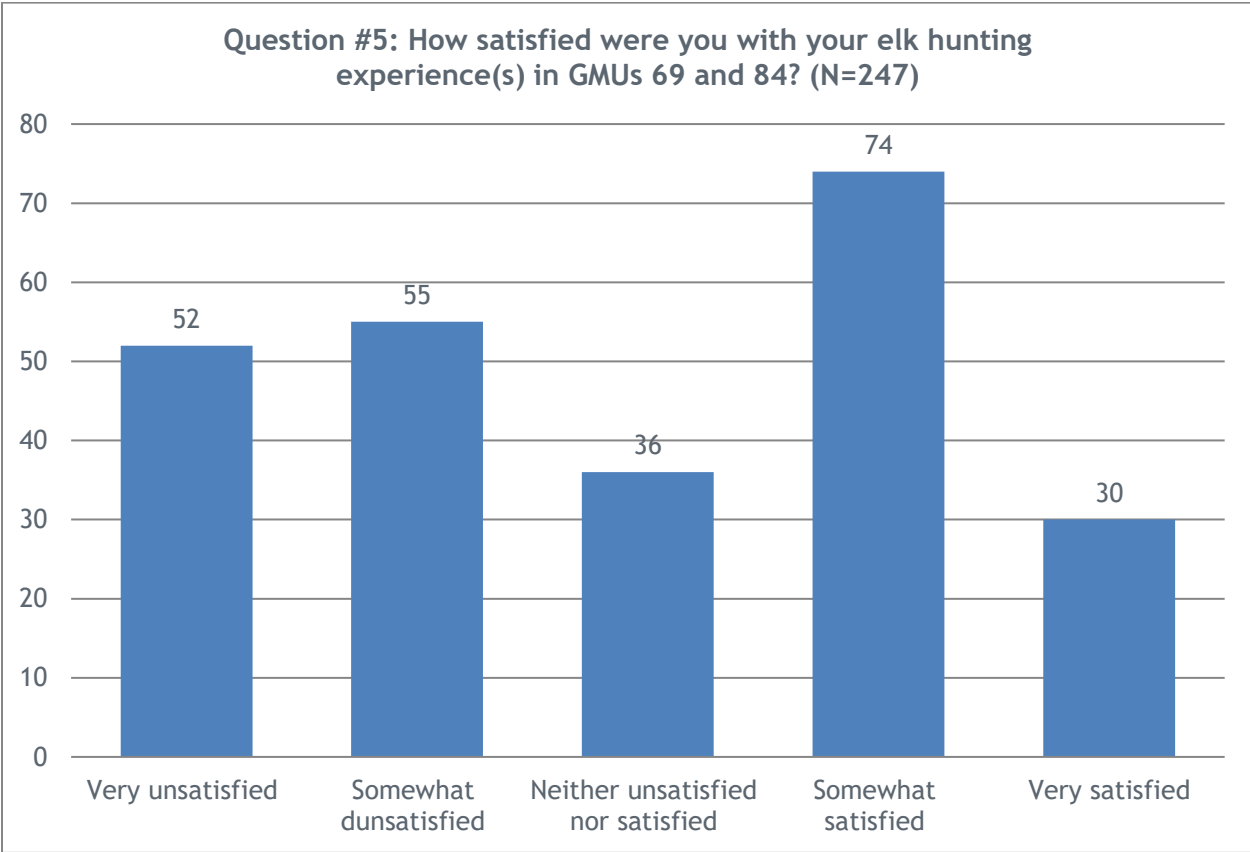
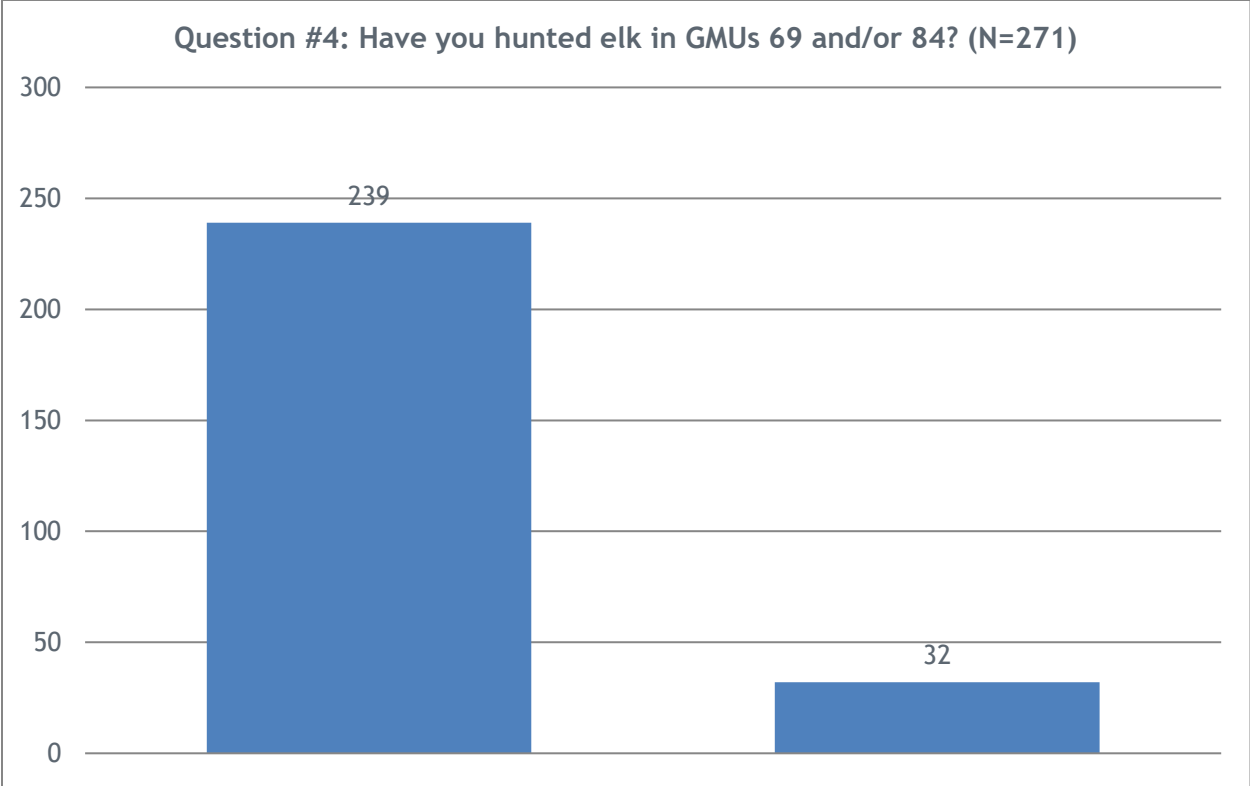
Here are the survey results:



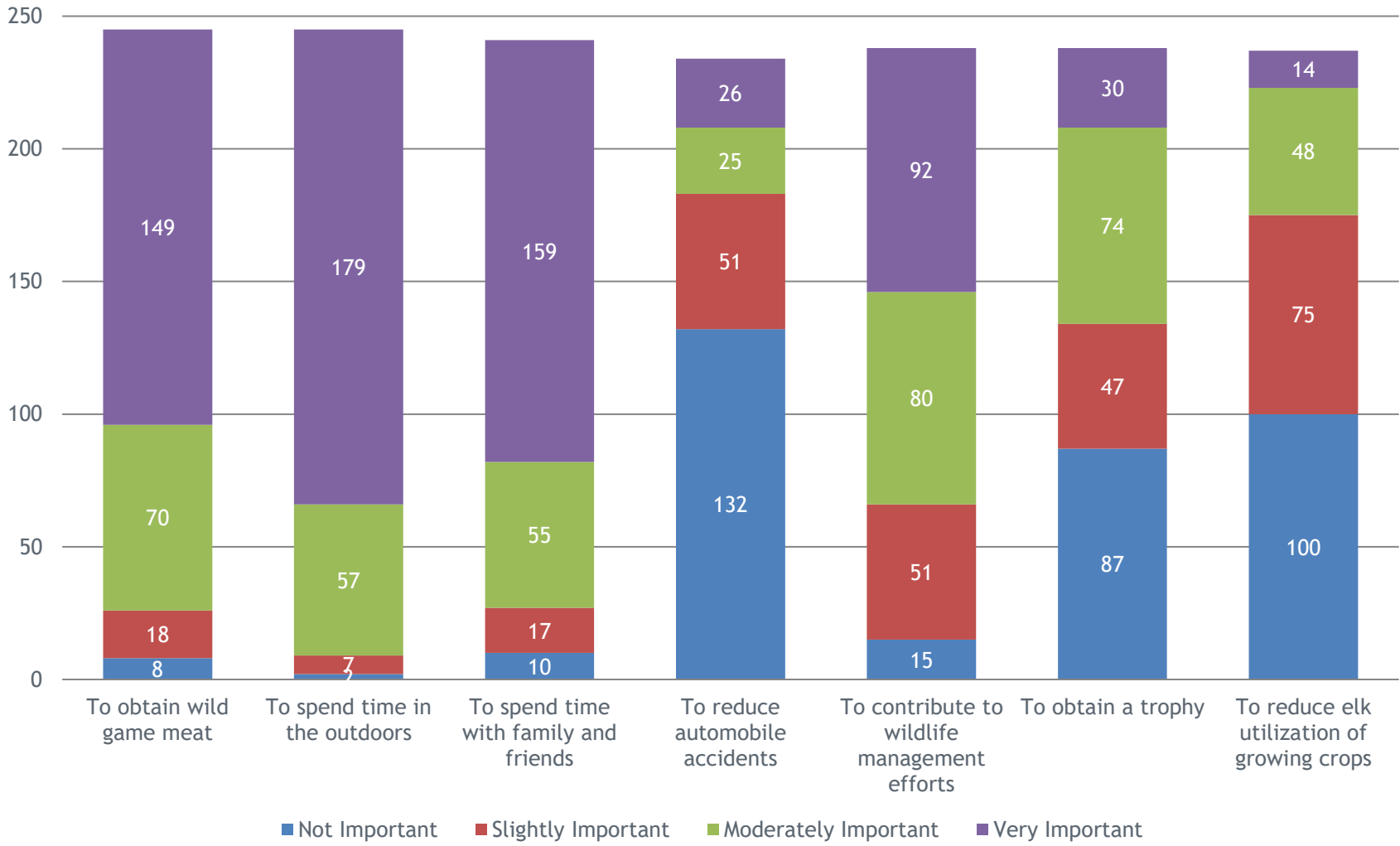


Other activities listed include:

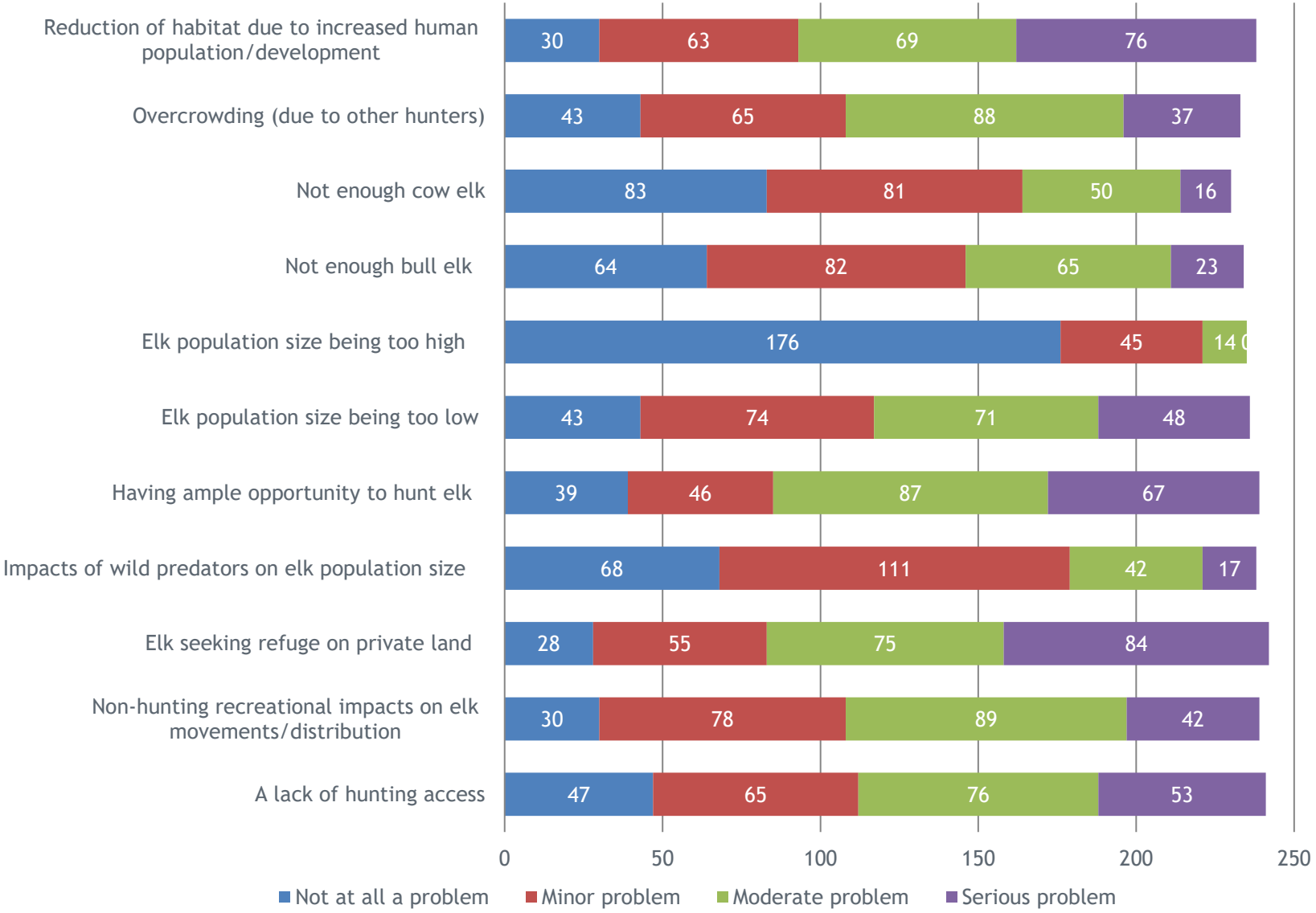
- Camping
- Firewood gathering
- Horeseback riding
- Sightseeing
- Mountain Home

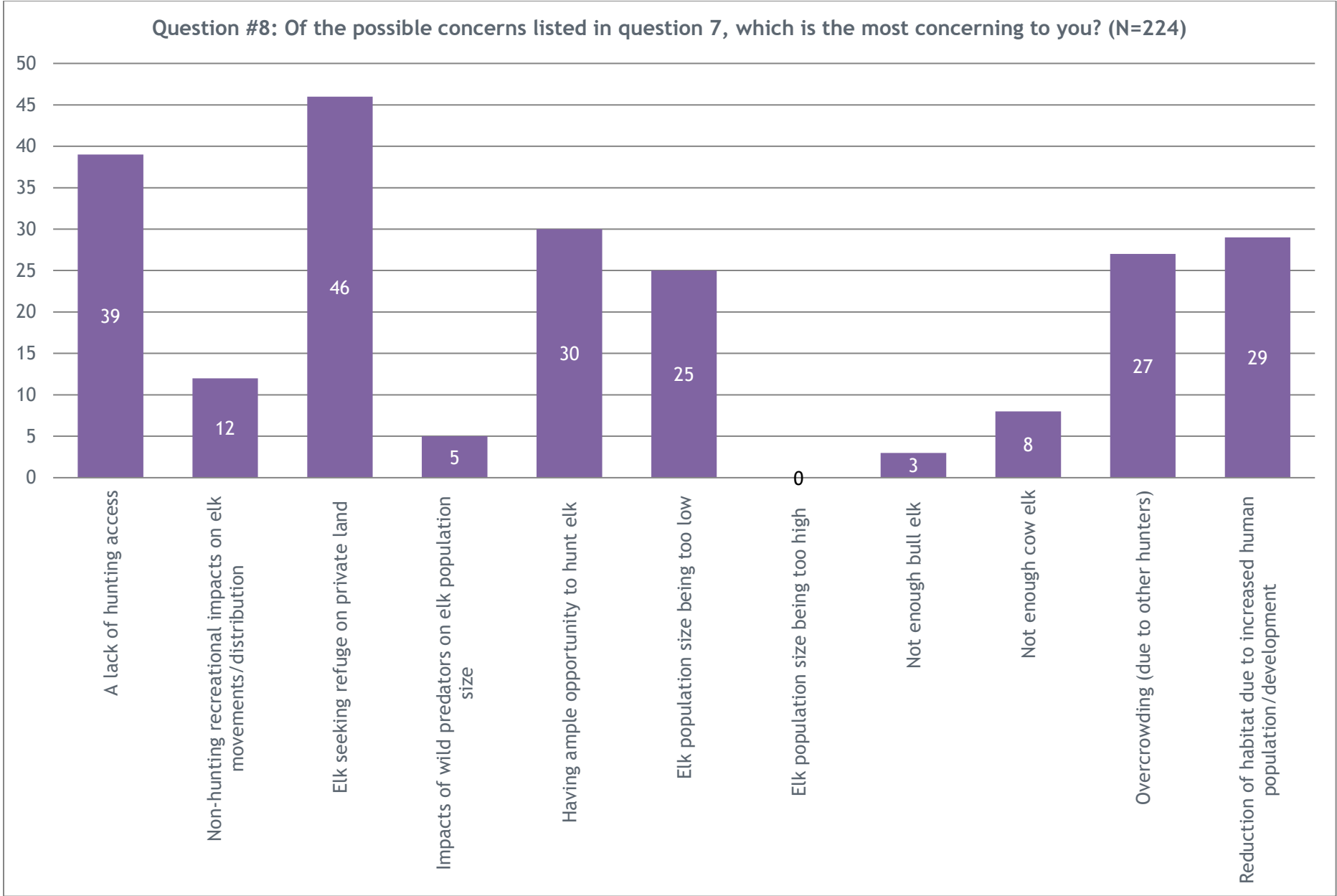


Question #6: How important to you is each of the following reasons to hunt elk in GMUs 69 and/or 84? (N=245)

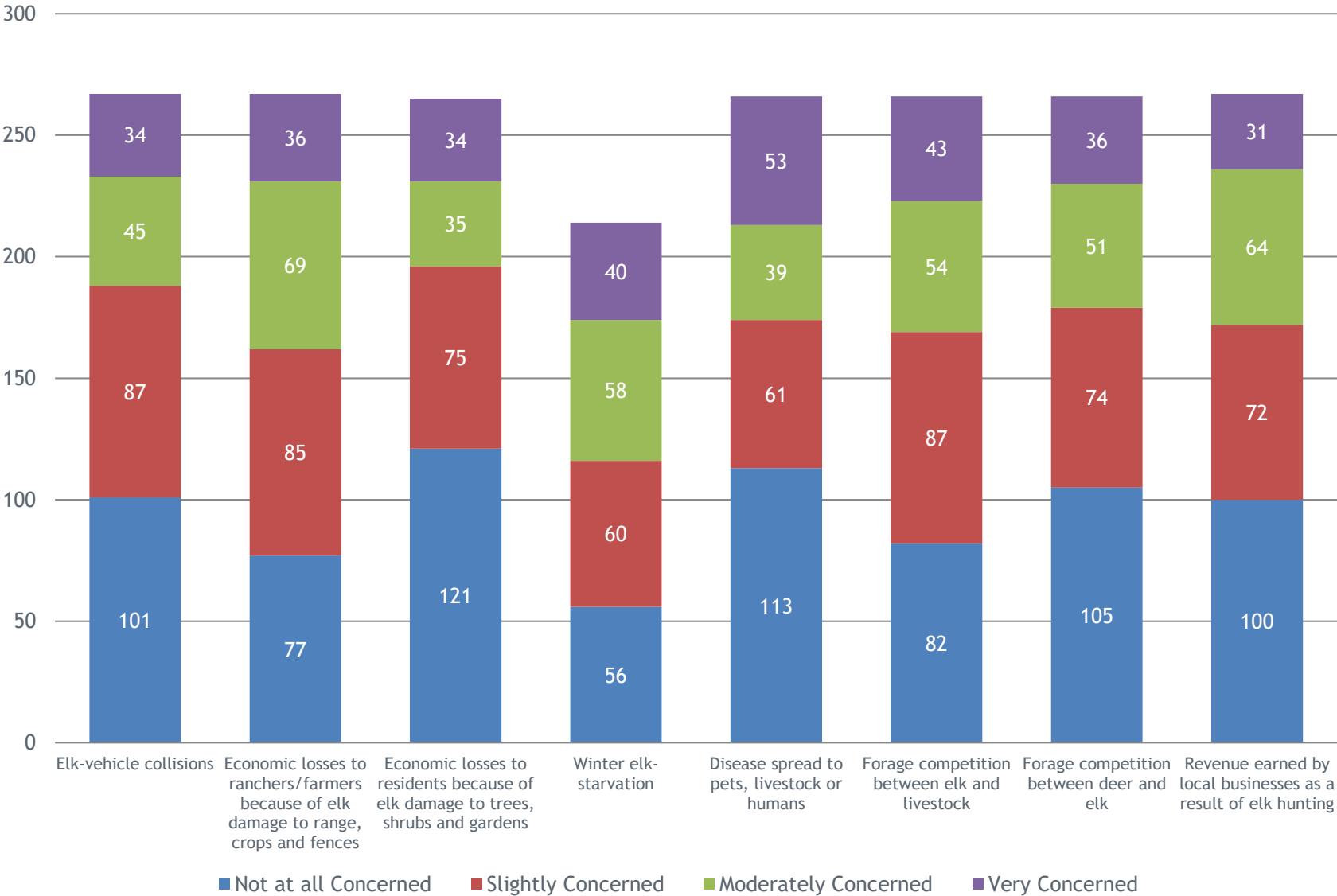


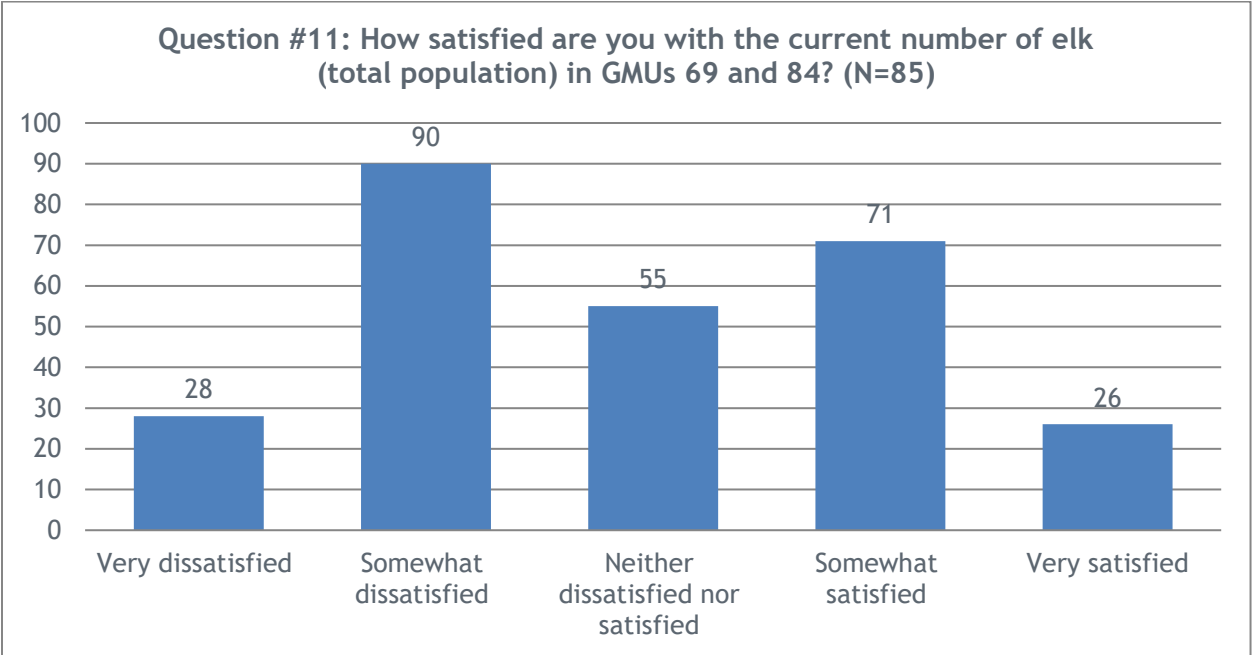
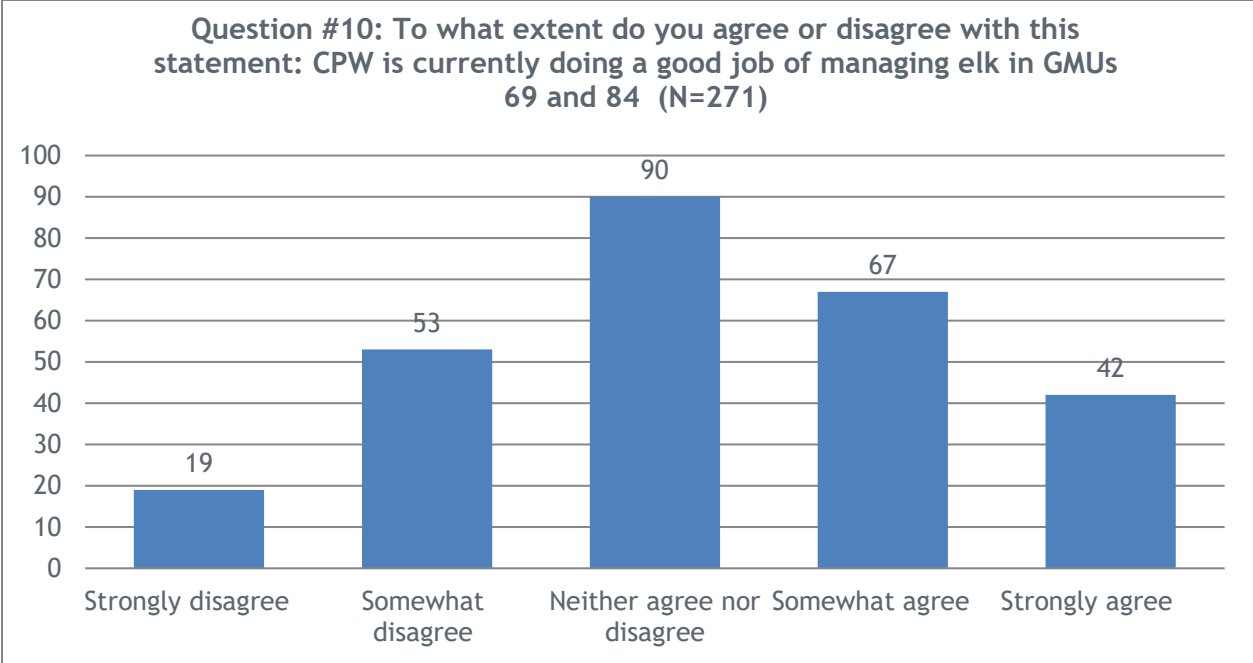
Question #7: The following is a list of possible concerns that hunters may have with elk in GMUs 69 or 84. How concerned are you about each of the following? (N=242)

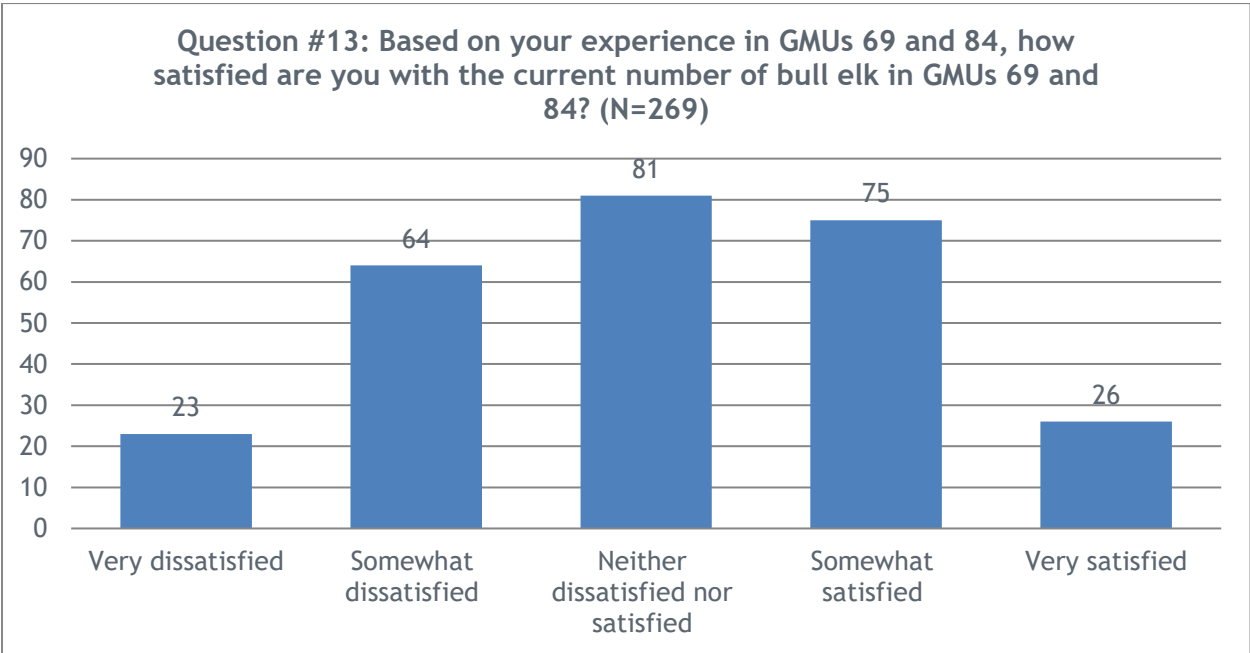
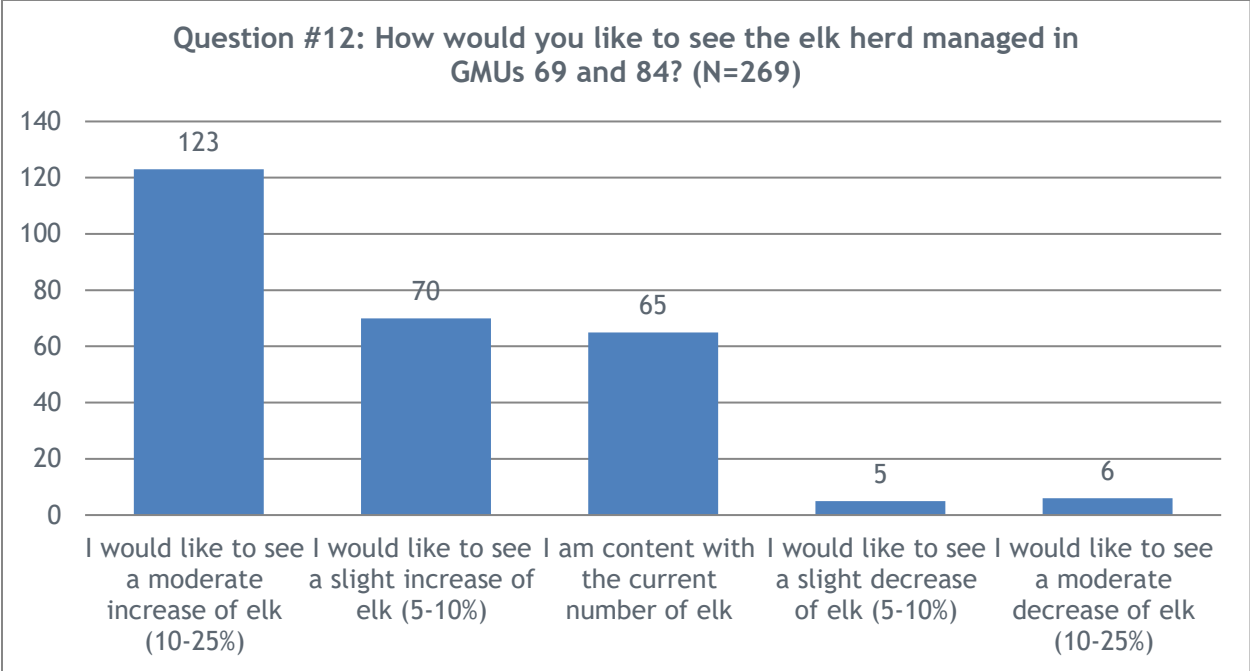


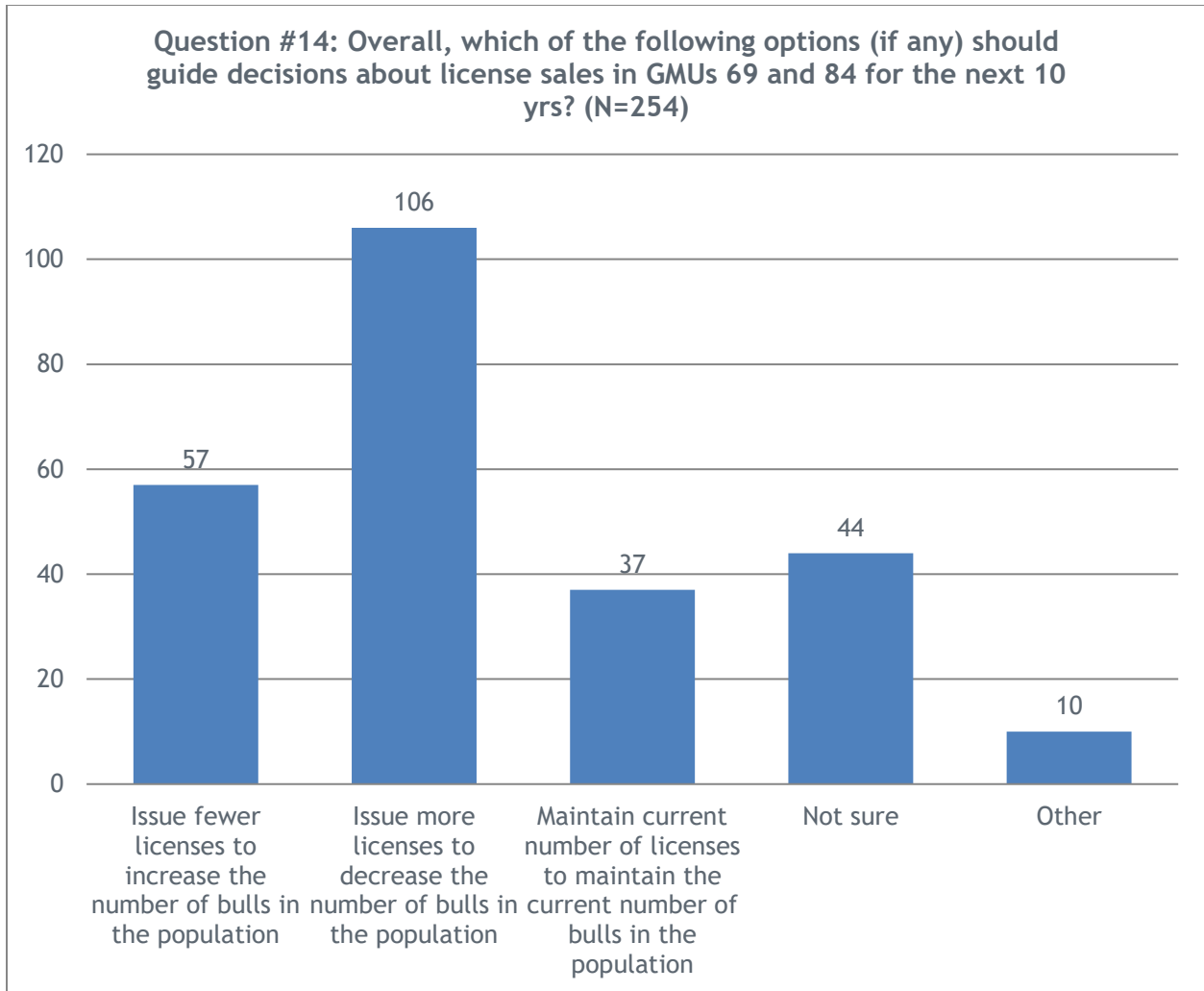


Question 9: The following is a list of possible concerns that people may have with elk in GMUs 69 or 84. How concerned are you about each of the following? (N=266)









Other comments provided on question #14 included:

- ADD LATE SEASON OVER-THE-COUNTER LICENSES
- I BELEIVE THE #S ARE OK BUT ITS HARD TO HARVEST BULLS AS THEY USE PRIVATE PROPERTY
- IF DRAW LICENSES ARE LIMITED SO SHOULD PRIVATE LAND VOUCHERS. SAN GRA DECRISTO OUTFITTERS HARVEST MORE THAN 30 BULLS A SEASON ON PRIVATE LAND. THERE ISNT ENOUGH ACCESS TO PUBLIC LAND WHICH THEY TAKE ADVANTAGE OF. THIS CREATES AN UNFAIR ADVANTAGE FOR OUTFITTERS AND MAKES THOSE WHO CAN'T AFFERD A \$6000.00 P.L.V. CROWD INTO ONE ANOTHER.
- OPEN TO RESIDENTS ONLY
- GIVE MORE LANDOWNER LICENSES
- ALL ELK HUNTING SHOULD BE DRAW-ONLY STATEWIDE.
- INCREASE PREFERENCE POINTS FOR BULLS
- REDUCE COW HUNTING

- I WOULD LIKE TO SEE MORE BULL LICENSE ISSUED FOR THE 4TH SEASON FOR NONRESIDENT + LESS BULL LICENSE FOR 2ND SEASON FOR NONRESIDENT
- NEW BOUNDARY FOR 69 84 SEPRATE
- MORE PEOPLE ARE HUNTING PRIVATE LAND AND ARE NOT HUNTING THE PUBLIC LAND WHICH MAKE IT HARDER FOR HUNTER TO DRAW A TAG FOR PUBLIC.
- NEED MORE ELK
- NO OUT OF STATE LICENSES

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: 15 COMMENTS
THINGS ARE CURRENTLY WORKING: 9 COMMENTS
COMPLAINTS RELATED TO REDUCING NR ALLOCATION: 7 COMMENTS
WOULD LIKE TO SEE MORE ELK: 6 COMMENTS
TOO MANY LANDOWNER VOUCHERS: 4 COMMENTS
INCREASE ATV ACCESS: 4 COMMENTS
DECREASE ATV ACCESS: 4 COMMENTS
TOO MUCH HUMAN DEVELOPMENT: 3 COMMENTS
ISSUE MORE LICENSES: 3 COMMENTS
COMMENTS RELATED TO CHANGING SEASON DATES OR GMU BOUNDARIES: 3 COMMENTS
COMMENTS RELATED TO INCREASING NR ALLOCATION: 3 COMMENTS
COMMENTS ABOUT LANDOWNERS HERDING ELK OFF PUBLIC LANDS: 2 COMMENTS
COMMENTS ABOUT RIFLE HUNTING DURING ARCHERY SEASON: 2 COMMENTS
COMPLAINTS ABOUT LOGGING ACTIVITY: 2 COMMENTS
COMPLAINTS ABOUT "OTHER" RECREATION DURING HUNTING SEASON: 2 COMMENTS
ALL LICENSES SHOULD BE OTC: 1 COMMENT
INCREASE THE OPPORTUNITIES FOR YOUTHS: 1 COMMENT
COMPLAINTS ABOUT OTHER HUNTERS: 1 COMMENT
TOO MANY MOUNTAIN LIONS: 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-28

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 and sex ratio 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. Elk distribution is still a concern in the area, but the committee feels that they have the resources to deal with conflicts if they arise.

The Sangre de Cristo committee also discussed the proposed sex ratio alternative. We believe the current sex ratio is a good balance and provides ample hunting opportunity while also providing for a reasonable number of mature animals for those hunters who want to take a larger bull. This accommodates sportsmen's desires and maintains local economic benefits.

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 28. 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", written over a circular stamp or seal.

John Stroh II, Chair
Sangre de Cristo HPP Committee



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 black 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.