

ELK MANAGEMENT PLAN

DATA ANALYSIS UNIT E-38 Clear Creek Herd

**GAME MANAGEMENT UNITS
29 & 38**

Prepared for:
Colorado Division of Wildlife

By:
Sherri Huwer
Terrestrial Wildlife Biologist
Northeast Region

Date: October 31, 2005



TABLE OF CONTENTS

INTRODUCTION AND PURPOSE	4
DESCRIPTION OF DAU	5
Location and Habitat	5
Climate.....	6
Vegetation.....	6
Land Use.....	6
HERD MANAGEMENT HISTORY	9
Post-hunt Population Size	9
Post-hunt Herd Composition	10
Harvest.....	10
Licenses	12
Hunting Pressure	14
Success Rates	16
CURRENT HERD MANAGEMENT	16
Current Management Problems.....	17
HABITAT RESOURCES.....	17
ISSUES AND STRATEGIES.....	18
Summary of Issues	18
ALTERNATIVE DEVELOPMENT	18
Population Objective	18
Herd Composition - Sex Ratios.....	19
PREFERRED OBJECTIVES AND ALTERNATIVES.....	20
Management Implications	20
Hunting:	20
Non-hunting Population Control Alternatives:.....	21
Damage:	21
APPROVAL / SIGNATURES	23
APPENDIX A: Public Comments	24

LIST OF TABLES

Table 1: Number of elk licenses in GMU 29 from 1988 to 2004. ES = Either Sex; NS = Not an established season	13
Table 2: Number of elk licenses in GMU 38 from 1988 to 2004. ES = Either Sex; OTC = Over-the-counter; SW = Statewide; NS = Not an established season..	13
Table 3: Average hunter success rate and range per season type in DAU E-38, GMU 29, and GMU 38 from 1988 to 2004.	16

LIST OF FIGURES

Figure 1: E-38 elk population estimate from 1988 to 2004.....	1
Figure 2: Observed, predicted and objective sex ratios for E-38 from 1988 to 2004.....	1
Figure 3: E-38 elk harvest estimate from 1988 to 2004.....	1
Figure 4: Management by Objective process used by the Colorado Division of Wildlife to manage big game populations by Data Analysis Unit.....	4
Figure 5: Geographic location of elk Data Analysis Unit E - 38, GMU 29 and GMU 38.	5
Figure 6: Land ownership in elk DAU E - 38.....	7
Figure 7: Overall, summer and winter ranges of elk in DAU E - 38.	8
Figure 8: Population estimates for E-38 from 1988 to 2004	9
Figure 9: Elk harvest in DAU E-38 from 1988 to 2004.	11
Figure 10: Elk harvest in GMU 29 from 1988 to 2004.....	11
Figure 11: Elk harvest in GMU 38 from 1988 to 2004.....	12
Figure 12: Total number of hunters in DAU E-38, GMU 29 and GMU 38 from 1988 to 2004.	14
Figure 13: Number of elk hunters in GMU 29 from 1988 to 2004 during archery, muzzleloader, rifle cow (including regular rifle antlerless and PLO antlerless seasons), and rifle bull seasons.	15
Figure 14: Number of elk hunters in GMU 38 from 1988 to 2004 during archery, muzzleloader, rifle antlerless (including regular rifle antlerless and PLO antlerless seasons), and rifle antlered seasons (including regular rifle cow and PLO either-sex seasons).....	15
Figure 15: Overall hunter success rates in DAU E-38, GMU 29 and GMU 38 from 1988 to 2004.	16

DAU E-38 (Clear Creek) EXECUTIVE SUMMARY

GMUs: 29 and 38
Land Ownership: 60% Private, 21% USFS, 1% BLM, 3% State, 14% City/County Open Space, 1% Other Federal
Posthunt Population: **Previous Objective** 1,200 **2004 Estimate** 1,150 **Current Objective** 1,000 – 1,400
Posthunt Sex Ratio: **Previous Objective** 35 **2004 Observed** 29 **2004 Modeled** 38 **Current Objective** 35-40

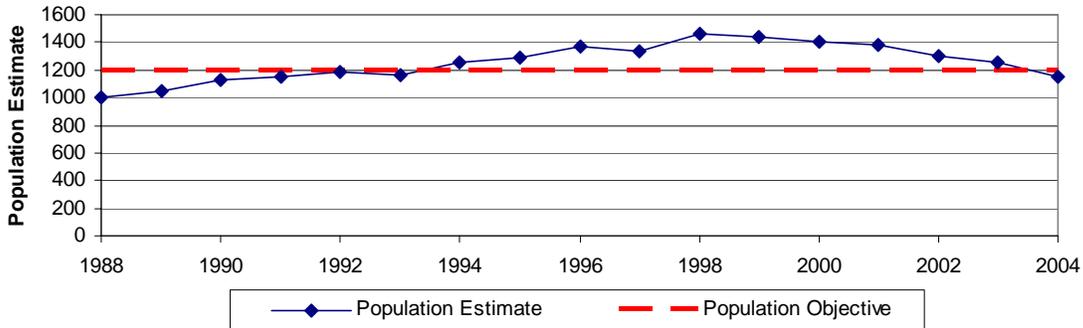


Figure 1: E-38 elk population estimate from 1988 to 2004.

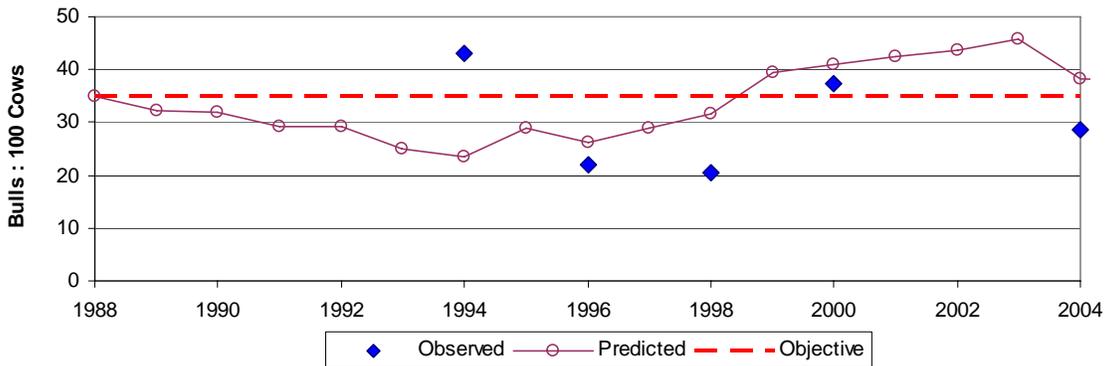


Figure 2: Observed, predicted and objective sex ratios for E-38 from 1988 to 2004.

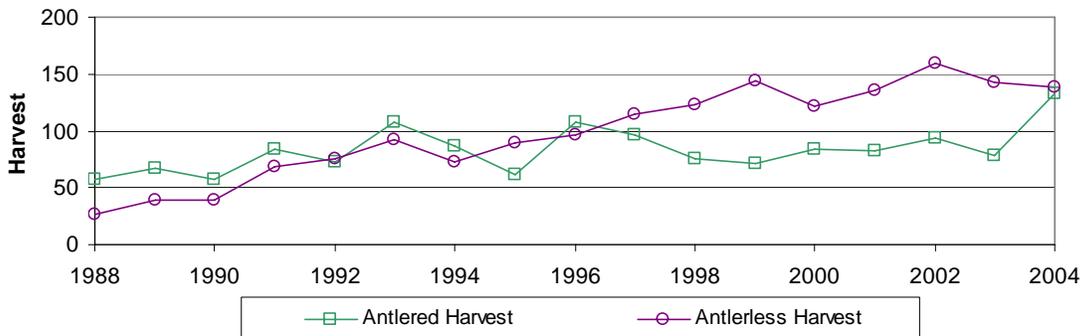


Figure 3: E-38 antlered and antlerless elk harvest estimates from 1988 to 2004.

E-38 Background

The Clear Creek elk herd (E-38) contains Game Management Units (GMUs) 29 and 38. GMU 29 is managed as a quality elk unit with all elk licenses limited in number. In contrast, GMU 38 is managed to allow maximum hunter recreation and has over-the-counter (OTC) rifle bull and archery either-sex licenses, as well as statewide muzzleloading elk licenses. GMU 38 is the only unit offering OTC licenses on the Northern Front Range and is less than an hour drive from the Denver metro area.

The Clear Creek post-hunt population grew from approximately 1000 elk in 1988 to almost 1500 elk in 1998 and then decreased to the current population of approximately 1200 elk (Figure 1). The current bull:cow ratio is estimated at 35 - 40 bulls:100 cows (Figure 2). Hunting pressure has changed little in GMU 29 over the last decade, but it has increased substantially in GMU 38. On average, the number of rifle antlerless and archery hunters has increased 3 fold and the muzzleloader hunters have increased 7 fold. The total annual harvest in E-38 has increased from 85 in 1988 to 271 in 2004 (Figure 9). This increase was largely due to the increase in the antlerless harvest in GMU 38. This increase was due to an increase in the total number of regular rifle antlerless tags, the initiation of an antlerless private land only (PLO) season, the opening of the Green Ranch portion of Golden Gate Canyon State Park and Jefferson County's Centennial Cone properties to elk hunting.

E-38 Significant Issues

Hunter harvest is the primary method for maintaining the herd at the population objectives. The largest threat to achieving harvest objectives in the future is that of potential loss of hunter access to elk due to land development.

Chronic wasting disease (CWD) has not been detected in elk within E-38, however elk have tested positive in the adjacent DAUs to the north, south and west of E-38. CWD has been detected in mule deer in both GMUs of this DAU.

There were some complaints from hunters about crowding expressed at the public meetings. Hunter success rates in GMU 38 have remained steady, although low, with increasing hunter numbers. Bull:cow ratios have remained relatively high for an OTC unit primarily due to elk using private land or public land with limited hunter access during the rifle seasons.

E-38 Management Alternatives

This DAU plan presents 3 population objective alternatives. Alternative 1 is to reduce the current population by approximately 15% to 800-1000 elk. Currently, elk cause little damage in this DAU; a reduction in elk numbers is not expected to reduce the frequency of damage claims. A population reduction in this DAU would require an aggressive antlerless hunting strategy and possibly non-hunting population reduction methods. Alternative 2 is to maintain the herd at its current level (i.e., 1000 – 1400). This alternative would require that harvest and hunter access to elk remain at current levels as land development in the unit continues. Alternative 3 is to allow the herd to increase in number to 1600 - 2000 elk. Once this population level is reached, a substantial increase in cow harvest will be required to maintain it. Non-hunting population control would likely be required to maintain this higher population level. Game damage on private and public land would likely increase along with the elk population, as would the opportunities for watchable wildlife and hunting. The DOW recommends Alternative 2. Most comments from residents, hunters and public land managers indicate that current elk population

numbers are acceptable. Colorado Division of Wildlife (CDOW) and United States Forest Service (USFS) staff do not want to see elk numbers increase while suitable habitat decreases due to residential development and increasing recreational use of public lands.

This DAU plan also presents 2 herd-composition alternatives. Alternative 1 is to lower the bull-cow ratio to 25 bulls per 100 cows. It is unlikely that this could be achieved with the current hunting season structure. Alternative 2 is to maintain the current ratio of 35 - 40 bulls per 100 cows. At this level, the herd provides mature bulls for wildlife viewing and quality hunting experiences. The DOW recommends Alternative 2.

This DAU plan was approved by the Colorado Wildlife Commission on March 9 2006.

INTRODUCTION AND PURPOSE

The Colorado Division of Wildlife (CDOW) manages wildlife for the use, benefit and enjoyment of the people of the state in accordance with the CDOW's Strategic Plan and mandates from the Colorado Wildlife Commission (CWC) and the Colorado Legislature. Colorado's wildlife resources require careful and increasingly intensive management to accommodate the many and varied public demands and growing human impacts. The CDOW uses a "Management by Objective" approach to manage the state's big game populations (Figure 4).

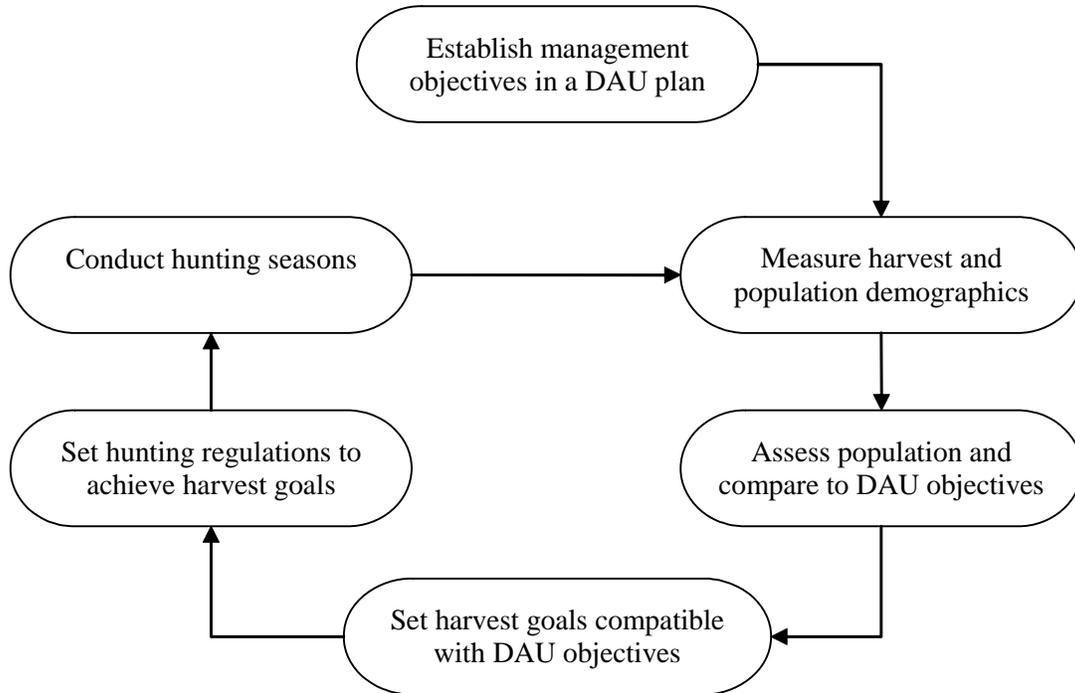


Figure 4: Management by Objective process used by the Colorado Division of Wildlife to manage big game populations by Data Analysis Unit.

In this 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 the majority of the animals in a herd is 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) in order to distribute hunters and harvest within a DAU.

Management decisions within a DAU are based on a Data Analysis Unit management plan. The primary purpose of a DAU plan is to establish population and herd composition (i.e., the number of males per 100 females) objectives for the DAU. The DAU plan also describes the strategies and techniques that will be used to reach these objectives. During the DAU planning process, public input is solicited and collected by way of questionnaires, public meetings and comments to the CWC. The intentions of the CDOW are integrated with the concerns and ideas of various stakeholders including the U.S. Forest Service, the Bureau of Land Management, hunters, guides and outfitters, private landowners, local chambers of commerce and the general public. In preparing a DAU plan, agency personnel attempt to balance the biological capabilities of the herd

and its habitat with the public's demand for wildlife recreational opportunities. DAU plans are approved by the CWC and are reviewed and updated every 10 years.

The DAU plan then 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 DAU plan. Hunting seasons are then set and licenses are allocated to either maintain or move toward the objectives.

DESCRIPTION OF DAU

Location and Habitat

The Clear Creek elk DAU is located in central Colorado in portions of Clear Creek, Jefferson, Gilpin, and Boulder counties. The DAU contains GMUs 29 and 38 (Figure 5). The DAU is bounded by I-70 and US 40 on the south; the Continental Divide on the west; the Brainard Lake Road and Left hand Canyon on the north; and I-25 on the east. Municipalities include Denver, Boulder, Golden, Nederland, Central City, Black Hawk, Idaho Springs, and Jamestown. Much of the central portion of the DAU contains unincorporated subdivisions. The elevation gradient across the DAU runs from approximately 5,300 feet in the eastern portion to over 13,000 feet on the Continental Divide on the western edge.

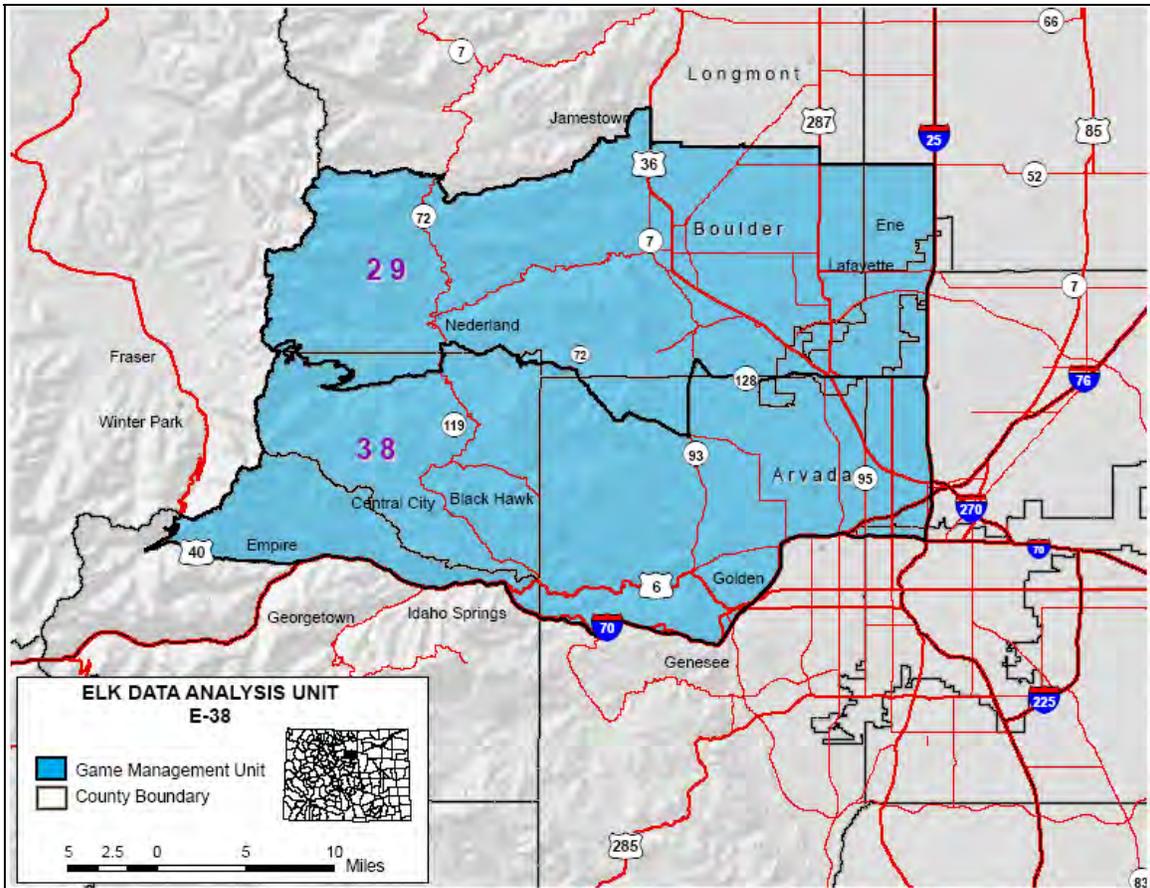


Figure 5: Geographic location of elk Data Analysis Unit E - 38, GMU 29 and GMU 38.

Climate

The climate varies greatly from east to west across the DAU, depending on elevation. The eastern portion has comparatively warm summer temperatures and mild winters. The western portion is much colder with snow covering timbered areas and north facing slopes from November through May.

Much of the DAU has relatively mild winters and is influenced by Chinook winds. These warm down slope winds melt snow quickly. Snow seldom stays for more than a few days on south-facing slopes below 9,000 feet. Alpine ridges usually stay open due to wind.

Vegetation

Vegetation is diverse depending on elevation and climate. The lowest elevation is in the Great Plains life zone, which is comprised of short grass prairie. There is a band of remnant tallgrass prairie immediately east of the first foothills. Much of the remaining tallgrass is on City of Boulder and Boulder County Open Space and Rocky Flats.

Foothills shrubs range from approximately 5,500 feet up to 7,500 feet. Species include mountain mahogany, juniper and currants. Mountain riparian communities are found along streams, wetlands and irrigation ditches from 5,600 to 11,000 feet. Willows, chokecherries, alders and narrowleaf cottonwoods are common species. Ponderosa pine dominated communities are found up to 8,500 feet with Douglas fir covering many north-facing slopes in the foothills. There are some agricultural fields, mainly hay and pasture, found in suitable areas up to 9,000 feet.

The DAU contains subalpine forests from 8,500 feet up to timberline at approximately 11,600 feet. Within the subalpine forest zone, lodgepole pine intermixed with aspen dominates up through 10,500 feet. Spruce/fir subalpine forest interspersed with meadows is dominant up to timberline. Stands of limber and bristlecone pine also occur at higher elevations.

Alpine tundra, alpine willows, and rock dominate above timberline.

Land Use

The Clear Creek elk DAU encompasses 896 square miles. Approximately 59.7% (535 mi²) is private land, 21.4% (192 mi²) is National Forest land, 0.6% (6 mi²) is BLM, 3.4% (30 mi²) is State Land, 10.2% (91 mi²) is City of Boulder and Boulder County Open Space, 3.4% (30 mi²) is Jefferson County Open Space, 0.3% (3 mi²) is Clear Creek County Open Space, and 1.1% (10 mi²) is other federal lands. Most National Forest is located in the western ½ of the DAU, while most Open Space and Park land is located in the eastern portion (Figure 6).

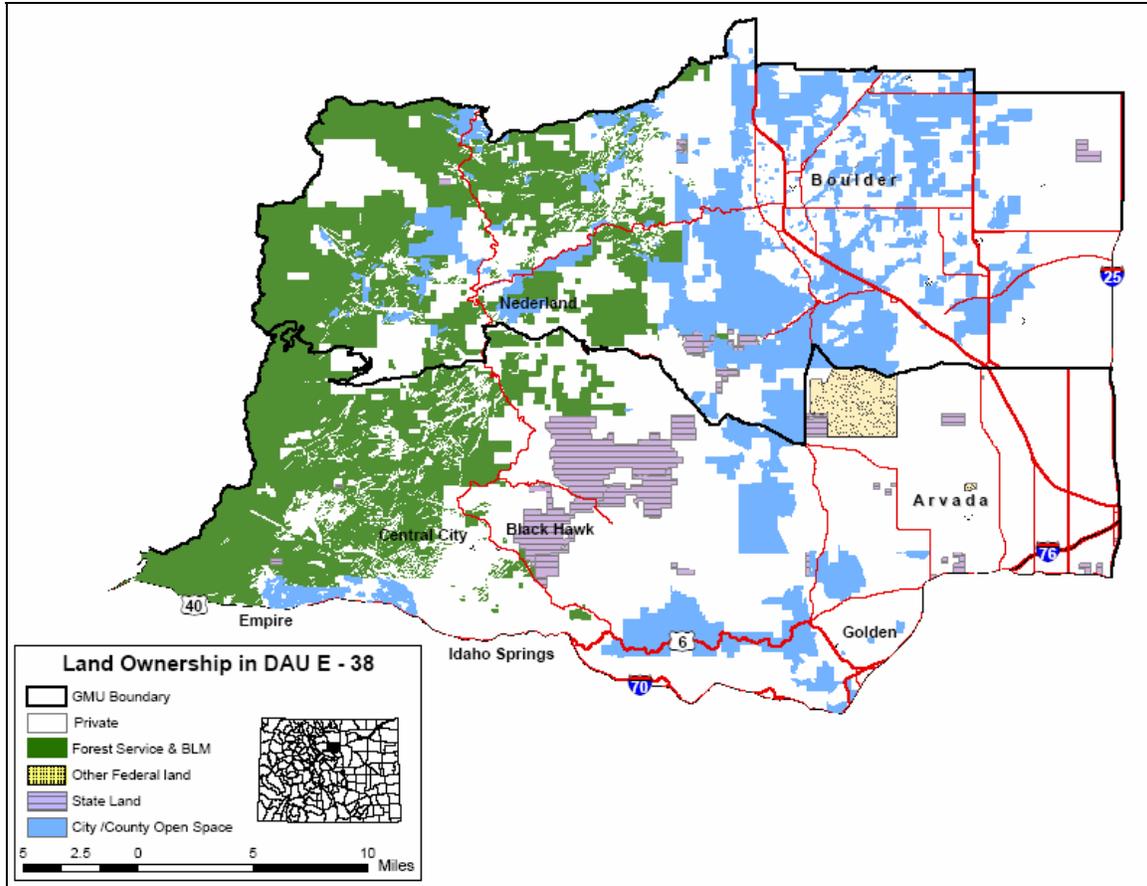


Figure 6: Land ownership in elk DAU E - 38.

National Forest provides elk calving, summer, fall, and winter habitat for the majority of the Clear Creek elk herd. There are substantial differences in the timing of National Forest use by elk between the 2 GMUs. A small percentage of the elk in GMU 38 winter on National Forest. Most elk in GMU 38 winter on private land, Golden Gate Canyon State Park and Jefferson County Open space. GMU 38 elk continue to use private land throughout the year, but National Forest and Golden Gate Canyon State Park are very important calving and summer range. In contrast, elk in GMU 29 use National Forest land and some adjacent private land throughout the year. The subherds in GMU 29 use National Forest and the Boulder watershed in summer. Calving and rutting activities take place on National Forest, private land and Boulder County Open Space's Caribou Ranch. Winter range in GMU 29 includes National Forest, several Boulder County Open Space properties and private land.

Elk use on City of Boulder Open Space and Mountain Park lands is minimal within the DAU. The most notable use is at the mouth of Coal Creek Canyon. During the last decade, a group of up to 100 elk have used City of Boulder Open Space and Mountain Park and Jefferson County Open Space lands during February – early May. The Centennial Cone Open Space is the only Jefferson County Open Space property that gets substantial winter and spring elk use within the DAU. Boulder County Open Space has substantial elk use on their Caribou Ranch and Reynolds Ranch properties and moderate, winter use of Walker Ranch. Golden Gate Canyon State Park sees substantial elk use of the Green Ranch property and the Gilpin County portion of the park, but only light use of the Jefferson County portion.

Elk distribution was determined using several sources of information including, a radio telemetry study supported by Eldora Ski Area in the mid-1980's, visual collar re-observations, CDOW field staff, and observations by other natural resource agencies' staffs, hunters and local residents.

Of the geographic area covered by the DAU, 59% (546 sq. mi.) is considered elk range. Elk range includes all of the land west of Colorado Highway 93 and US Highway 36. Elk winter range comprises approximately 33% (305.9 sq. mi.) of the DAU (Figure 7). Severe winter range covers 9% (76.4 sq. mi.). Winter conditions are seldom severe enough to concentrate elk on severe winter range.

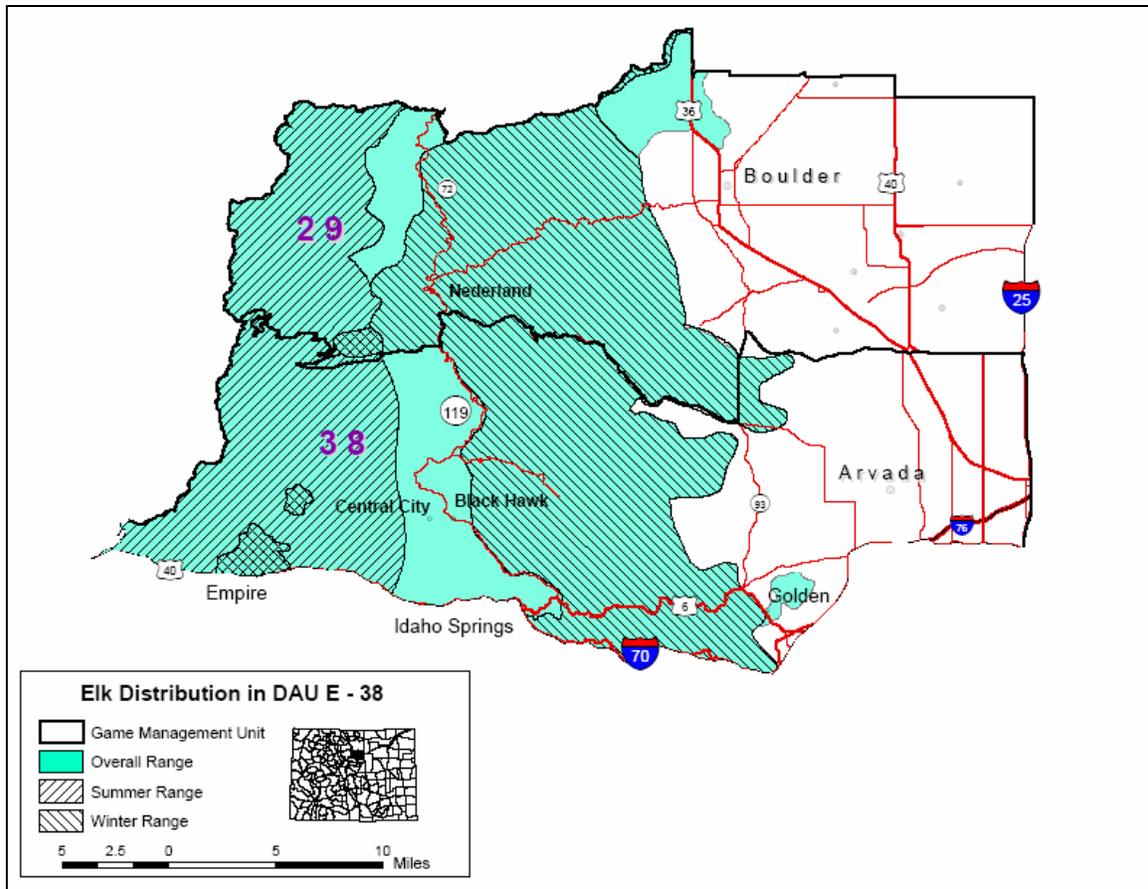


Figure 7: Overall, summer and winter ranges of elk in DAU E - 38.

Much of the private lands have the potential to be developed into residential subdivisions. Agriculture activities on private land consist of hay production and cattle and horse grazing. There are 2 grazing allotments on the US Forest Service's Boulder district. The Mammoth allotment is for a total of 88 cow/calf pairs (60 on National Forest and 28 on private) and run from July 7 to September 7. The Caribou allotment is for 110 cow/calf pairs from July 10 through September 10. The Caribou allotment has not been grazed for the last 10 years.

There are 3 allotments on the Clear Creek Ranger District within the DAU. The allotments are the Fall River, Gilpin and Central City allotments. The Fall River allotment has not been grazed for the last 6 years. Twenty cow/calf pairs and a bull are permitted on the Gilpin and Central City allotments combined, which may be grazed from July 1 to September 30.

Outdoor recreation on public lands is substantial. Hiking, four wheeling, horseback riding, motorbike riding, mountain bike riding, angling, hunting and wildlife viewing are primary uses. Hunting is not currently allowed on open space lands except on Jefferson County Open Space’s Centennial Cone property. The Boulder County Parks and Open Space Department lists hunting as an option for deer and elk population management on 3 of their newer properties.

HERD MANAGEMENT HISTORY

Post-hunt Population Size

The E-38 DAU boundaries were changed in 1987, as a result, population estimates for the current DAU are not available prior to 1988. The CDOW’s population goal for this unit for the last decade has been 1200 elk. Current population models indicate that the post-hunt population grew from approximately 1000 elk in 1988 to approximately 1500 elk in 1998 and then declined to the current population of approximately 1200 elk (Figure 8).

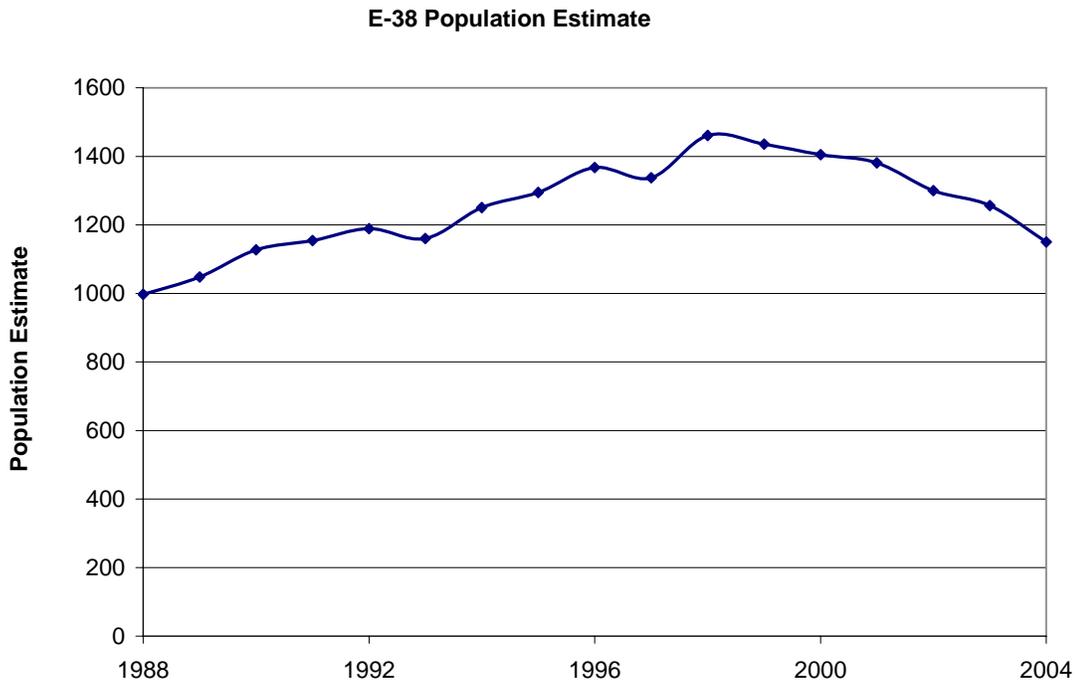


Figure 8: Population estimates for E-38 from 1988 to 2004.

These population estimates are derived from computer models, which incorporate estimates of mortality, initial population size, sex ratio at birth, observed age ratios, hunter harvest, and wounding loss. Estimating population numbers of wild animals over large geographic areas is a difficult and approximate science. Numerous attempts have been made to accurately count known numbers of wild animals in large fenced areas. All of these efforts have failed to count 100% of the animals. The CDOW recognizes the difficulties of estimating the size of elk populations as a challenge in managing populations and attempts to maximize the accuracy of these estimates by using the latest technology and inventory methodology available. As better

information and techniques becomes available (e.g., new estimates of survival/mortality, wounding loss, sex ratios, density, or new modeling techniques and software) they are evaluated and used where appropriate. The population estimate presented in this document should, therefore, not be considered a completely accurate enumeration of the animals in the DAU.

Post-hunt Herd Composition

There are 5 years (1994, 1996, 1998, 2000, and 2004) of observed post-hunt age and sex ratio data that is reliable and represents the entire DAU. Elk in the Clear Creek DAU are difficult to count and classify. They frequent residential areas and areas with heavy conifer cover, where they are difficult to see from the air or ground. High winds and lack of consistent snow cover further add to the difficulty of post-hunt elk surveys.

Herd composition data were collected using a helicopter. Observed post-hunt calf:cow ratios were 43, 46, 51, 32, and 37 calves:100 cows for 1994, 1996, 1998, 2000, and 2004 respectively. Observed post-hunt bull:cow ratios were 43, 22, 21, 37, and 29 bulls:100 cows for 1994, 1996, 1998, 2000, and 2004 respectively. Bull:cow ratios include spikes and branch-antlered bulls.

Bull:cow ratios are often underestimated during surveys due to behavioral differences between sexes when surveys are conducted. Cows, calves and young bulls gather in large groups during the surveys, often exceeding 100 animals. These groups tend to use open habitats where visibility is high, such as meadows. In contrast, older bulls segregate from the cows into much smaller groups. These bull groups tend to use habitat where visibility is low such as steep slopes covered with trees. Smaller groups of animals located in low visibility habitat are more often overlooked during surveys than large groups of elk in open habitat. As a result, more bulls are missed than cows during the surveys. Computer modeling indicates the current bull:cow ratio is 35 - 40 bulls:100 cows. Field observations, hunter success rates, and the quality of bulls harvested support this estimate.

Harvest

Factors affecting the number of elk harvested in E-38 each year are: 1) the number of specified licenses sold in GMUs 29 and 38; 2) the number of over-the-counter licenses sold in GMU 38; 3) weather; 4) season structure; 5) areas open to hunting 6) hunter success.

The total annual harvest in E-38 has increased from 85 in 1988 to 271 in 2004 (Figure 9). On average, over the last 17 years, antlered and antlerless harvest has increased slightly in GMU 29 as has antlered harvest in GMU 38 (Figure 10 and Figure 11). The largest increase in harvest has been in the antlerless harvest in GMU 38. Three factors have contributed to this increase. First, there was a doubling in the total number of regular rifle antlerless tags from 1988 to 1995. Second, the antlerless private land only (PLO) season, initiated in 1996 has been 4 - 5 months long, allowing landowners a good chance to harvest elk, even on small properties where elk are transient. These PLO harvests are important due to the fact that a large portion of the elk in GMU 38 moves off National Forest prior to the regular rifle seasons, leaving only a small portion of the herd on National Forest through the rifle seasons and winter. Third, the Green Ranch portion of Golden Gate Canyon State Park opened to elk hunting in 1998 and Jefferson County's Centennial Cone property opened to elk hunting in 2001. Although only 10-16 elk per year have been killed on these 2 properties combined, the hunting pressure keeps large numbers of elk from remaining on them throughout the hunting seasons. As a result, hunting on these properties has increased harvest on nearby private lands and National Forest.

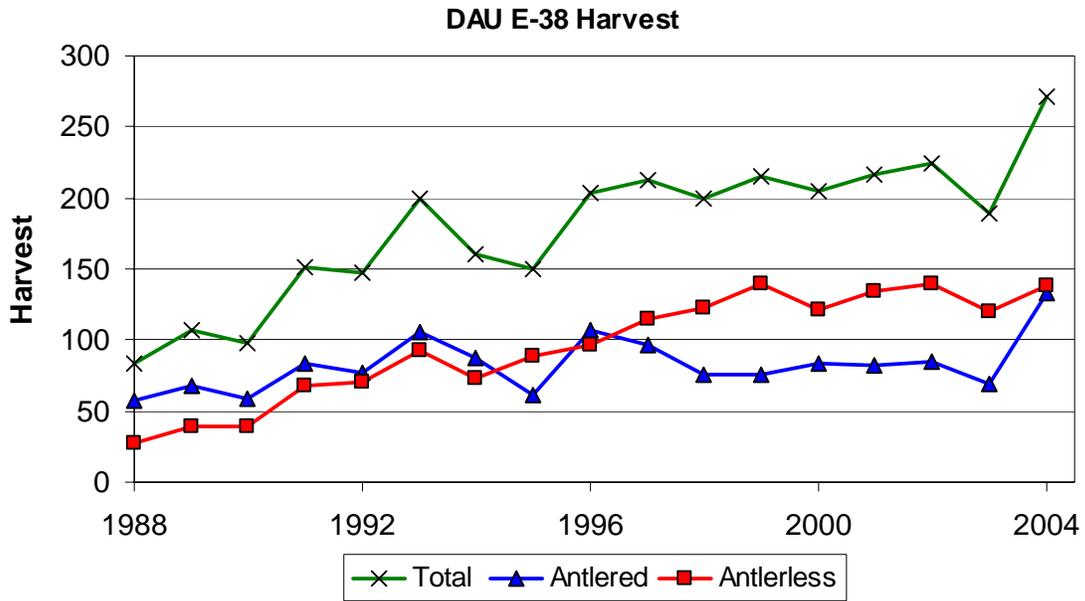


Figure 9: Elk harvest in DAU E-38 from 1988 to 2004.

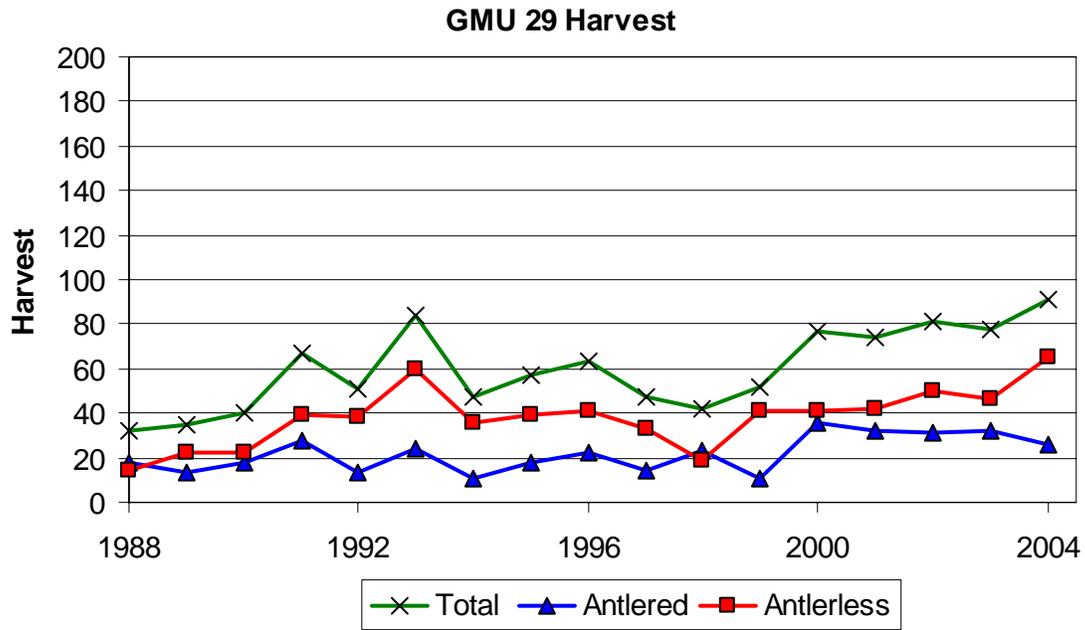


Figure 10: Elk harvest in GMU 29 from 1988 to 2004.

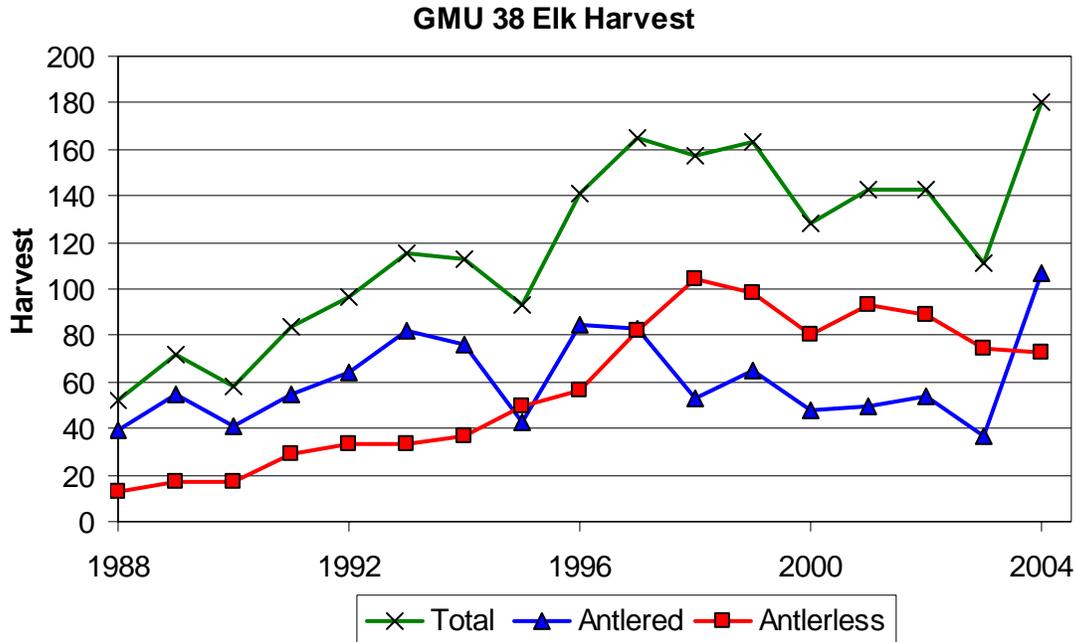


Figure 11: Elk harvest in GMU 38 from 1988 to 2004.

Licenses

The license number histories for GMUs 29 and 38 are shown in Table 1 and Table 2, respectively. In GMU 29, licenses for each hunting season are limited in number. Over the last decade, season structure and license numbers have changed slightly. Most notably, in 1999, a PLO antlerless season was added, and in 2000, a 4th season antlerless season was added. The total number of antlerless licenses was kept the same during both of these season additions by shifting licenses from the existing rifle seasons to the PLO seasons. In 2000, a 4th antlered rifle season was added.

In GMU 38, in 2005, all antlerless rifle elk licenses will be limited in number as will antlered elk licenses in the 1st and 4th rifle seasons. Muzzleloader antlered and antlerless licenses are statewide licenses, which are limited in number. Antlered elk licenses for the 2nd, and 3rd rifle seasons, archery either-sex, archery antlerless, are not limited in number and can be purchased over-the-counter. 2005 will be the first year that 4th season antlered rifle licenses will be limited in number. Previously they were sold over-the-counter and unlimited in number. PLO antlerless licenses were offered for the first time in GMU 38, in 1996. From 1996 to 1998, half of the antlerless licenses were shifted from the regular seasons to the PLO season, so that the total number of antlerless elk licenses in GMU 38 did not change substantially with the addition of the PLO type license. The intention of this shift was to direct harvest to the largest, and most likely to cause damage, portion of the herd. In 2000, a PLO either-sex season was created. In 2001, a late antlerless season was created with licenses that were valid only in the Jefferson County portion of GMU 38. This season was created to facilitate hunting on Jefferson County's Centennial Cone property.

E-38 Elk Management Plan

Table 1: Number of elk licenses in GMU 29 from 1988 to 2004. ES = Either Sex; NS = Not an established season.

Season	Hunt Code	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Archery ES	EE029O1A	40	15	30	35	35	40	40	50	50	50	50	50	50	50	50	50	50	50
Muzzleloader Antlerless	EF029O1M	NS	10	0	0	20	25	30	30	30	30	30	30	30	30	30	30	30	30
Regular Rifle Antlerless	EF029O1R - EF029O4R	55	70	85	115	160	180	160	160	160	160	160	135	125	125	125	125	125	95
PLO Cow	EF029P5R	NS	25	35	35	35	50	50	50										
Muzzleloader Antlered	EM029O1M	NS	15	20	20	25	35	35	35	35	35	35	35	35	35	35	35	35	35
Regular Rifle Antlered	EM029O1R - EM029O1R	55	25	20	20	20	25	25	25	50	50	50	50	60	60	95	95	60	60

Table 2: Number of elk licenses in GMU 38 from 1988 to 2004. ES = Either Sex; OTC = Over-the-counter; SW = Statewide; NS = Not an established season.

Season	Hunt Code	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Archery ES	EE000U1A	OTC																	
Archery Antlerless	EF000U1A	NS	OTC	OTC	OTC	OTC													
Muzzleloader Antlerless	EF000O1M	SW																	
Regular Rifle Antlerless	EF038O1R - EF038O4R	120	120	120	130	130	165	215	240	200	175	150	150	150	150	150	150	105	105
PLO Antlerless	EF038P5R	NS	50	75	100	150	150	150	185	185	100	100							
Late Antlerless	EF038L1R	NS	50	80	80	60	60												
Muzzleloader Antlered	EM000O1M	SW																	
Rifle Antlered 1	EM038O1R	OTC	100	100	100	100	100	100											
Rifle Antlered 2 & 3	EM000U2R EM000U3R	OTC																	
Rifle Antlered 4	EM038O4R	NS	OTC	OTC	OTC	OTC	OTC	50											
PLO Either Sex	EE038P1R	NS	15	15	15	15	15	15											

Hunting Pressure

Hunting pressure in GMU 29 is limited by the number of licenses issued by the CDOW. As with license numbers, total pressure increased from 1988 to 1993 and has remained fairly constant since 1993 (Figure 12). The number of rifle antlerless, archery, and muzzleloader hunters followed this general trend (Figure 13). Specifically, antlerless rifle hunters increased steadily from 54 in 1988 to 176 in 1993 and have remained relatively constant for the past 10 years with an average of 146 hunters per year. Muzzleloading hunters increased from 27 in 1988 to 55 in 1993, since 1993 hunter numbers have averaged 56 hunters per year. The number of archery hunters increased from 21 in 1988 to 50 in 1995, with an average of 44 hunters per year since 1995. Rifle antlered hunters have also fluctuated with the number of licenses offered, from 53 hunters in 1988, to a low of 17 in 1989, to a high of 80 in 2002. In 2004, a total of approximately 300 hunters hunted elk in GMU 29.

Hunting pressure has increased substantially in GMU 38 over the last 17 years (Figure 14). The number of antlered rifle hunters, which is not limited in this unit, increased steadily from 400 in 1988 to 628 in 1999, decreased to 347 in 2001 and then increased to 455 in 2004. On average, the number of rifle antlerless and archery hunters has increased 3 fold and the muzzleloader hunters have increased 7 fold. In 2004, approximately 1,100 elk hunters hunted in GMU 38.

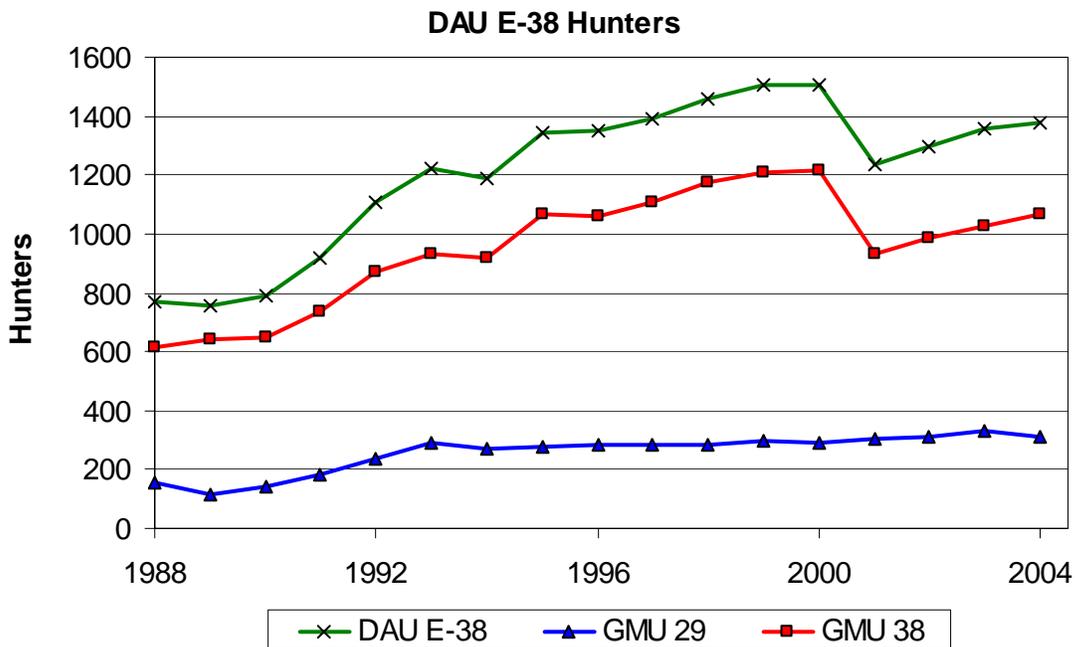


Figure 12: Total number of hunters in DAU E-38, GMU 29 and GMU 38 from 1988 to 2004.

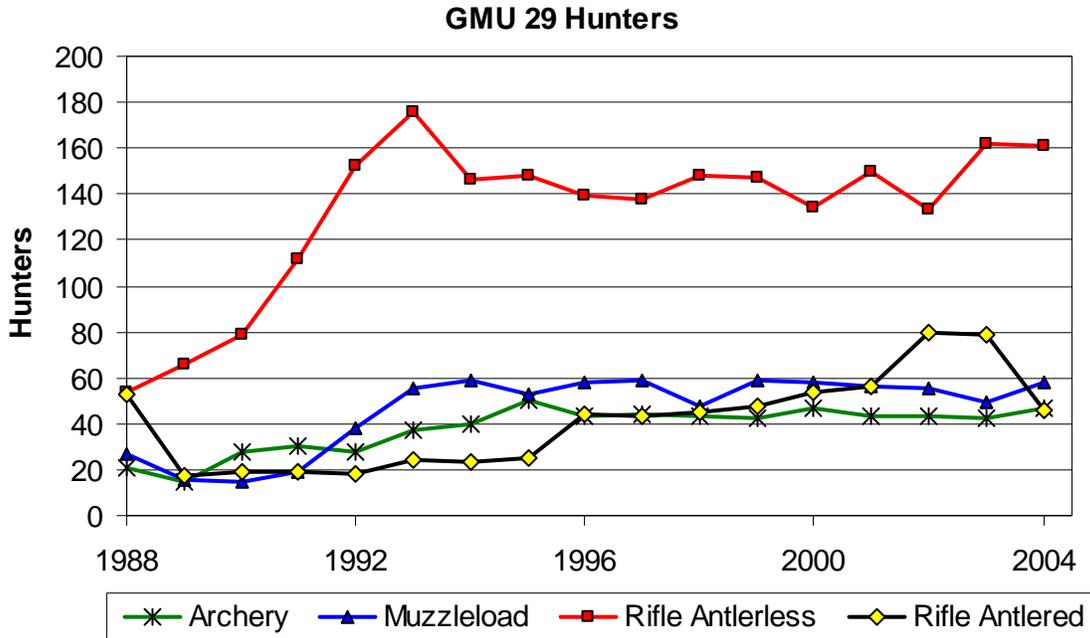


Figure 13: Number of elk hunters in GMU 29 from 1988 to 2004 during archery, muzzleloader, rifle cow (including regular rifle antlerless and PLO antlerless seasons), and rifle bull seasons.

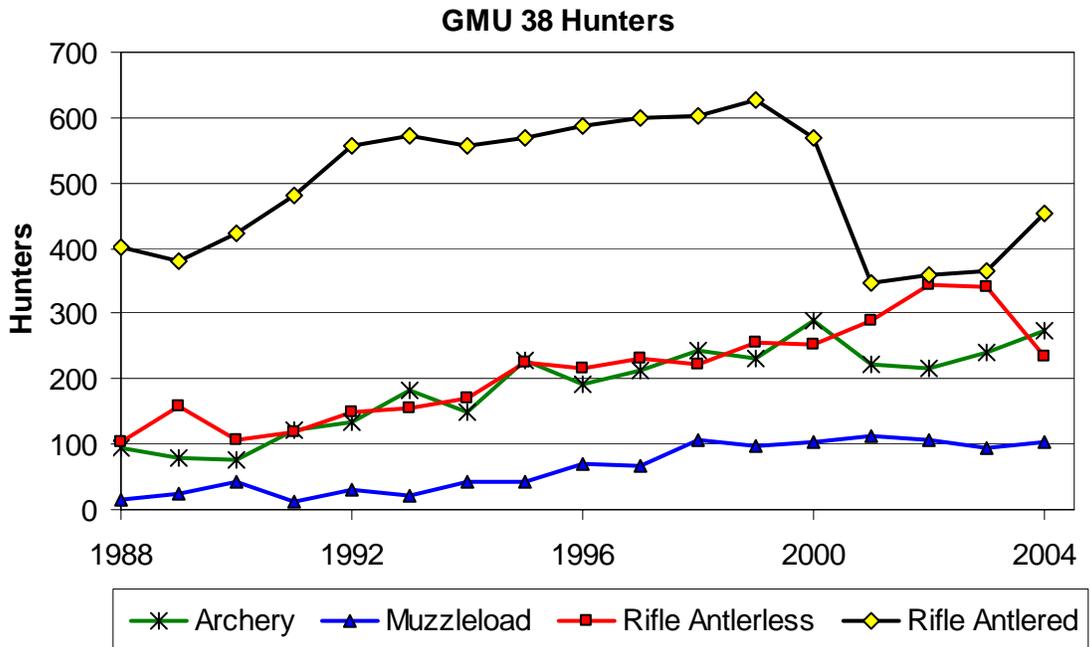


Figure 14: Number of elk hunters in GMU 38 from 1988 to 2004 during archery, muzzleloader, rifle antlerless (including regular rifle antlerless and PLO antlerless seasons), and rifle antlered seasons (including regular rifle cow and PLO either-sex seasons).

Success Rates

Success rates vary from year to year (Figure 15). The 16 year averages for DAU E-38, GMU 29 and GMU38 respectively are 14%, 24%, and 12%, respectively (Table 3). The average success rates from 1988 to 2004 per season type for the DAU and individual GMUs are given in Table 3 along with their ranges.

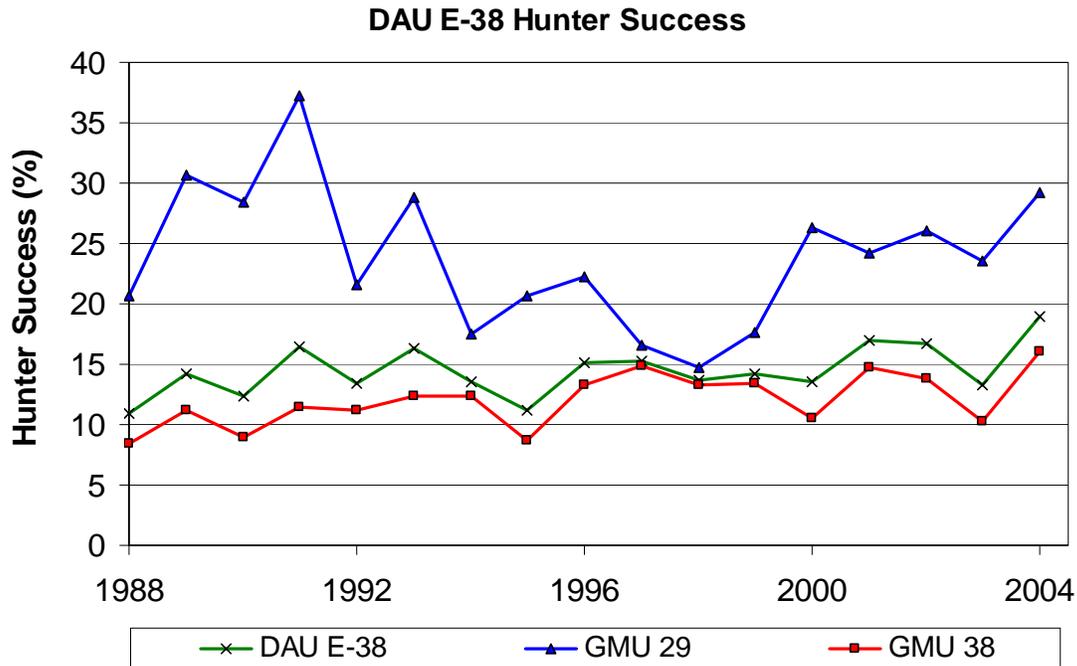


Figure 15: Overall hunter success rates in DAU E-38, GMU 29 and GMU 38 from 1988 to 2004.

Table 3: Average hunter success rate and range per season type in DAU E-38, GMU 29, and GMU 38 from 1988 to 2004.

Season Type	DAU E-38	GMU 29	GMU 38
Archery	10 (3-16)	12 (0-27)	9 (3-17)
Muzzleloader	17 (6-42)	17 (8-37)	17 (3-50)
Rifle Cow	19 (10-27)	24 (12-35)	15 (5-22)
Rifle Bull	11 (7-20)	36 (19-79)	10 (3-20)
PLO	41 (26-50)	52 (41-61)	39 (24-50)
Total	14 (11-19)	24 (15-37)	12 (8-16)

CURRENT HERD MANAGEMENT

The Clear Creek elk herd’s current post season population estimate is approximately 1,200 animals. It has been the intention of the CDOW to hold the elk population near this number. Approximately 40% of the elk winter in GMU 29 and 60% winter in GMU 38. Some of the elk from both GMUs leave the DAU and summer in adjacent alpine and subalpine areas on the west

side of the Continental Divide in GMU 28. The first substantial snowfall moves these elk back into the Clear Creek DAU. In most years, all of the elk return to GMUs 29 and 38 prior to or during the regular rifle seasons.

The Clear Creek elk herd, especially the portion in GMU 38, increased in numbers from 1988 to 1998 and then began to decrease. Antlerless harvest objectives were often not met during the late 1980s and early 1990s due to inadequate hunter access to elk. In GMU 38, most National Forest land is west of the Peak to Peak Highway (Highways 119 and 72) (Figure 6), but most elk move east of the Highway prior to the regular rifle seasons. Since 1996, PLO licenses have focused more elk hunting pressure east of the Peak to Peak Highway. These PLO antlerless licenses in combination with the opening of the Green Ranch portion of Golden Gate Canyon State Park and Jefferson County's Centennial Cone property to hunting were largely responsible for the increased antlerless harvest.

It is believed that elk numbers have not increased significantly in GMU 29. In contrast to GMU 38, there is National Forest land on both sides of the Peak to Peak Highway and elk tend to stay west of the Peak to Peak Highway later in the fall in GMU 29. This gives hunters better access to the elk during hunting seasons than in GMU 38. PLO elk licenses have, therefore, not been needed extensively in GMU 29 to increase cow elk harvest. The Boulder watershed and Caribou Ranch are two large blocks of land in the northwestern portion of GMU 29 that do not allow hunting. These properties are mostly in public ownership by the City of Boulder or Boulder County where PLO licenses are not valid.

Damage complaints are low in both GMUs. However, damage caused by elk could become an issue as development and the human population increases, especially if the elk population were to increase simultaneously.

Bull:cow ratios are fairly high in the entire DAU. Totally limited license numbers in GMU 29, as well as elk distribution in relation to public land in GMU 38, limit hunting pressure on bull elk.

Although objectives have not been approved through the DAU planning process, managers have been operating with a post-hunt population objective of 1200 elk and a composition objective of 35 bulls:100 cows. Currently, the post-hunt population estimate is close to 1200, with an estimated 35 - 40 bulls:100 cows.

Current Management Problems

CDOW staff felt that there were few, if any, management problems in the Clear Creek elk DAU. Damage complaints are few and elk numbers are near objective. There are few conflicts between elk in this DAU and other big game species or livestock.

HABITAT RESOURCES

The quantity and quality of winter range is one of the limiting factors for the Clear Creek elk herd. However, winter range in this DAU is not as strict a limitation to elk numbers as it is on Colorado's western slope. Due to relatively mild winter conditions and Chinook winds, many elk spend the winter off traditional winter ranges.

There is 306 sq. mi. of mapped winter range in the DAU. Privately owned winter range could be developed, lowering carrying capacity for elk and increasing potential for human-elk conflicts. Increases in outdoor recreation on public lands could also decrease carrying capacity.

ISSUES AND STRATEGIES

Issues were identified at meetings and through written or phoned comments in April – July, 2000. Two public meetings were held in April: one in Nederland and one in Golden. Meetings were advertised in newspapers, on 2 websites, with flyers posted in local businesses, and through personal notification of groups or individuals known to be interested. These meetings were attended by CDOW personnel (District Wildlife Managers and the Terrestrial Biologist) and interested persons from the public. Letters, E-mails, and phone calls were encouraged from meeting attendees and from others that could not attend meetings.

The CDOW area terrestrial biologist also solicited individual comments from representatives of the Roosevelt-Arapaho National Forest, Boulder County Parks and Open Space, City of Boulder Open Space, City of Boulder Mountain Parks, Golden Gate Canyon State Park and Jefferson County Open Space regarding elk management in the Clear Creek elk herd.

This DAU plan was updated in June of 2005 by including data on license numbers, harvest, hunters, hunter success and land ownership changes for 2001 – 2005. The situation in the DAU did not change substantially from 2000 to 2005. To collect public input, the DAU plan was posted on the CDOW website and public input was requested.

Summary of Issues

Appendix A contains individual comments received during the public input process. Most people think elk numbers at the current time are acceptable. Overuse and damage problems are low in number, localized, and more a factor of distribution than overall elk numbers. A few hunters and residents want more elk and 1 person wants 10 - 20% less elk. Nearly everyone is happy with the current bull:cow ratio. One person would like to see more mature bulls.

CDOW and USFS staffs believe that increases in residential development and recreation related activities are not compatible with an increase in the number of elk.

ALTERNATIVE DEVELOPMENT

Population Objective

Alternative 1: 800 - 1000 elk post season

This would be approximately a 15% reduction from the current population estimate and would be similar to the population estimate for 1988. It would take an aggressive antlerless hunting strategy and possibly non-hunting alternatives, such as culling elk by CDOW or other authorized personnel, to achieve this reduction.

Elk cause little reported or observed damage currently. A reduction in herd numbers would not change the frequency of damage claims. The damage that occurs is related to temporary elk distribution more than elk population numbers.

A reduction in the elk herd may result in a decrease in satisfaction for hunters and wildlife watchers. Guides and outfitters may also be negatively impacted.

Alternative 2: 1,000 - 1,400 elk post season

This is the current population estimate for the DAU. A reduction in elk numbers would not be required under this alternative. As more land is developed or purchased by agencies that have not traditionally allowed hunting, maintaining adequate elk harvest will become more of a challenge. In order to maintain a population of 1,000-1,400 elk, recently acquired open space properties that experienced elk hunting while in private ownership must continue to allow at least limited antlerless elk hunting. The Green Ranch and Centennial Cone hunting programs can serve as models for these types of hunts.

Maintaining current elk numbers and distribution would allow the current level and quality of hunting and wildlife watching recreation. There would be no net impact on individuals and businesses involved in these types of recreation. Damage complaints are infrequent with the current elk population numbers.

Alternative 3: 1,600 - 2000 elk post season

This objective represents a 50% increase in elk numbers over the current population estimate. Once elk numbers increased to 1,800, it will take substantially increased antlerless elk removals to keep the herd at that number. At this higher population objective, it is more likely that non-hunting population control would have to be implemented. The cost of non-hunting population control would be greater than at lower population objectives because there would be more cow elk to handle.

Damage by elk on private land would increase with the higher population and elk damage may become a concern on National Forest and other public lands. Game damage payments by the CDOW and other conflicts with elk, such as elk-vehicle collisions, would increase.

Increasing human populations coupled with an increase in the elk population in the DAU could multiply damage and other conflicts. This elk population objective may not exceed current ecological carrying capacity and public acceptance, but increasing human populations and development will result in reduced ecological and social carrying capacity in the future. This may necessitate reducing a larger herd back to current numbers or lower. Herd reduction will be more difficult than maintaining the population at the current numbers. More elk will have to be removed and there will be fewer places large enough to allow rifle elk hunting.

Hunting recreation would probably increase with an increase in the number of elk assuming that these elk are on land where hunting is allowed. Watchable wildlife recreation opportunities and satisfaction may increase with more elk. Income from elk-related recreation would also increase somewhat.

Herd Composition - Sex Ratios

Alternative 1: 25 Bulls:100 cows:

This would be a 10-15 bulls:100 cows reduction from the current sex ratio. Even though ½ of the DAU area and over ½ of the elk population has had unlimited bull elk hunting since the current DAU boundaries were defined (17 years), the bull:cow ratio has remained above 35 bulls per 100 cows since 1999. It is, therefore, doubtful that the sex ratio could be reduced substantially with current hunting season structure. Trying to increase bull elk harvest may also interfere with achieving adequate cow elk harvest.

Alternative 2: 35 - 40 Bulls:100 cows:

This is within the range of the current estimated bull:cow ratio. It provides mature bulls for wildlife viewing and quality hunting experiences. It would not require a reduction or increase in bull licenses. Thus, it would have little fiscal impact on local businesses or antlerless harvest.

PREFERRED OBJECTIVES AND ALTERNATIVES

The CDOW recommends a post season population objective of 1,000-1,400 with a bull:cow ratio of 35 - 40:100. This corresponds with the current post season population and sex ratio estimates. The majority of the public's and land management agencies' comments support maintaining the current number of elk. The presence of elk on both public and private land improves the quality of life for residents. Most will tolerate current levels of damage for the opportunity to see elk near their homes. Overall, residents, land management agencies, CDOW staff, hunters and other wildlife enthusiasts are happy with the numbers and distribution of the Clear Creek elk herd. Although no elk has tested positive within E-38, maintaining elk numbers at 1,000-1,400 elk is compatible with current CWD management goals in adjacent CWD positive DAUs.

Allowing the elk population to increase is not advisable. Although the current habitat could support more elk, future carrying capacity will decrease with the increasing residential development and intensity of recreational use on public lands. A larger elk population would result in an increase in damage to private land, game damage payments by CDOW, and incidents of overuse in preferred habitat on public lands. As residential development and outdoor recreation increases, managing elk numbers with hunting will become more challenging. If the elk herd is allowed to increase, it is likely that hunting harvest will not be adequate to control elk numbers.

All comments regarding sex ratios supported maintaining or increasing the current bull:cow ratio and number of mature bulls. The higher sex ratio of Alternative 2 will result in a lower reproductive potential than the lower sex ratio of Alternative 1. This is due to the fact that in populations with higher sex ratios, there are more bulls and fewer cows. The number of breeding age females determines reproductive potential in all cases except those with very low numbers of bulls. Lower reproductive potential is desirable in this DAU where it is difficult to harvest adequate numbers of cow elk.

There were comments from hunters that crowding was becoming an issue on public land in GMU 38, especially in the archery and muzzleloader seasons. The crowding situation is unlikely to improve since GMU 38 is the only elk GMU that allows unlimited bull elk and archery hunting within 60 miles of Denver. As more elk GMUs become limited for all licenses, pressure on the remaining GMUs that allow unlimited elk hunting will increase.

History has shown that bull elk license numbers would not have to be limited in GMU 38 to maintain a relatively high bull:cow ratio.

Management Implications

Hunting:

The Clear Creek elk herd stands out on the Northern Front Range because it has been maintained near objective for a number of years with antlerless harvest. While the herd increased in the late 1980's and early 1990's, increasing antlerless licenses, implementing PLO antlerless licenses in a

5 month long season and opening the Green Ranch and Centennial Cone has reversed the population increase. However, if the elk population is to remain at objective, there must be no net loss in elk hunting access within the DAU. This means that open space properties that experienced elk hunting in the recent past while in private ownership must continue to allow at least limited antlerless elk hunting. The successful Green Ranch and Centennial Cone hunting programs can serve as models for these types of hunts.

Non-hunting Population Control Alternatives:

If antlerless harvest becomes inadequate in the future to control the elk population, then non-hunting alternatives may be required to meet harvest and population objectives. At this time, the most feasible non-hunting alternative would be culling (shooting) by CDOW personnel or other authorized personnel. Culling is not preferred over hunting by the CDOW to reduce elk numbers due to the cost of killing and processing elk. Culling may not be acceptable to local residents either. A 1997 survey of Evergreen residents found that culling was one of the least preferred population management alternatives.

Transplanting elk to control populations is not practical, because there are very few places that are willing to receive elk. Elk numbers in other Colorado elk DAUs are approaching or have exceeded objectives. Elk damage complaints are common in much of the state. Most other states with elk herds have similar problems with elk damage. Occasionally, another state will accept elk for reintroductions, but these projects are too infrequent and small to depend on for long-term population control removals.

Fertility control is currently not technically feasible on free-ranging wildlife populations. Even after the technology is available, it is doubtful that it can be successfully applied to a free-ranging population of elk the size of the Clear Creek elk herd. Even if fertility control becomes technically possible in free -ranging animals like deer and elk, treating large numbers of animals will be expensive. Preliminary modeling of the Rocky Mountain Arsenal deer herd indicates that 66% of adult females must become infertile to maintain the population at the desired level. After the first year, 22% of adult females would need to be treated annually.

Other considerations regarding fertility control must also be resolved. The effect of a significant reduction in the number of calves born annually on predator populations and behavior has not been explored. A Cornell study found that sterilization or fertility control on elk was acceptable to only 15% of Evergreen area residents. The cause of the low acceptance rating is unknown. It may be because people believe that fertility control in wild animals is unnatural. It may also be because people enjoy seeing calf elk. Fertility control may result in decreased watchable wildlife satisfaction and opportunities by reducing the number of calves born each year. If there are behavioral changes that decrease rutting behavior, such as bugling, viewing satisfaction will decline further.

All non-hunting elk removal options have a cost associated with them. The question of who will pay must be answered before they could be implemented. Local governments have paid for non-hunting options in many instances where deer population numbers have exceeded public tolerance. In these cases, state wildlife agencies continue to oversee and authorize all wildlife removals.

Damage:

The CDOW should continue to provide education and materials to prevent damage and encourage landowners with damage to allow hunting. The CDOW can also encourage habitat improvements

on public land (open space, National Forest, and State Parks) to attract elk away from private land. Dispersal hunts should be considered if warranted to disperse elk and harvest cow elk.

APPROVAL / SIGNATURES

We the undersigned, hereby accept and approve this wildlife management plan for the Clear Creek Elk Data Analysis Unit, E-38, on behalf of the Colorado Division of Wildlife and the Colorado Wildlife Commission.

Date _____

Bruce McCloskey, Director

Colorado Division of Wildlife

Date _____

Jeffrey A. Crawford, Chairman

Colorado Wildlife Commission

APPENDIX A: Public Comments

The issues and comments received during the 2 public meetings, in letters, during phone calls and from land management agencies are recorded below. They are not listed in order of importance. Some statements may contradict others and may not be supported by data or research.

Nederland Meeting (April 17, 2000)

- Elk herd is increasing in GMU 29, especially around Sugarloaf. (1 person)
- Elk may not be increasing in GMU 29. Magnolia/Winiger group is not increasing, but mixed opinions on the Sugarloaf group. (1 person)
- Total elk numbers should be reduced by 10 - 15%. (Outfitter)
- Increase the number of PLO cow tags. (Outfitter)
- Give permits for cows to people with over 500 acres of land so they can get people on to hunt. (Outfitter)
- Open Space departments do not allow hunting and that will make it difficult to manage elk populations. (several people)
- Green Ranch hunting helps a little, but it moves elk off onto private land. (Outfitter)
- Hunting on Green Ranch helped to move elk back to some National Forest land. (1 person)
- I want more elk and elk hunting licenses. I want as many elk as the habitat will support. (1 person)
- Some landowners in the Magnolia area would like elk to spend less time on their property. The elk knock down fences and cause other damage. (Representative of P.U.M.A.)
- There are quite a few bulls in GMU 38. (1 person)
- GMU 38 is getting too crowded with hunters. (almost everyone)

Golden Meeting (April 25, 2000)

- Open Centennial Cone Open Space to hunting by organized groups like Outdoor Buddies or youth hunting. Groups are safer than the general public. (A next door neighbor to Centennial Cone)
- Reduce the number of cow elk by 15 - 20%. (Outfitter)
- There are not more than 25 - 35 bulls:100 cows in GMU 38. (3 people)
- It is not crowded during rifle seasons in GMU 38. (several people)
- There was crowding during the muzzleloader season last year (1999) in GMU 38. (1 person)

E-38 Elk Management Plan

- Elk movement and migration might be changing due to new construction. (1 person)
- PLO licenses have changed elk behavior. Elk are much more skittish and it is harder to harvest a cow. (1 person)
- Weather in 1998 and 1999 affected elk movement. They weren't in the same areas during hunting season. They stayed higher than normal. (Several people)
- During the last 4 years, the largest number of elk observed in the Centennial Cone area has dropped from 450 - 600 down to only maybe 250 this past winter. Don't know if the cause is weather or fewer elk. (a few people)
- My local elk counts have gone down in the last 4 years. (1 person)
- Give out more PLO cow tags in GMU 38. (Outfitter and other persons)
- Bull:cow ratio is about right in GMU 38. (Outfitter)
- I'd like to see more bulls and a higher bull:cow ratio. Not more elk, just more bulls. (1 person)
- Split GMU 38 into 2 GMUs similar to GMUs 39 and 391. (1 person)
- It'd be a mistake to go to limited licenses for all seasons in GMU 38 due to the large amount of private land the elk are on. (Outfitter)
- There should be more hunters permitted on Green Ranch. (several people)
- The Gilpin County side of Golden Gate Canyon State Park should be open to elk hunting. (1 person)
- The Centennial Cone property of Jefferson County Open Space should be open to elk hunting. (several people)
- The Centennial Cone property of Jefferson County Open Space should be open to archery elk hunting. (2 people)
- Limit muzzleloader licenses only in GMU 38. (2 people)
- In 1995, elk overgrazed Centennial Cone area. (2 people)
- All the hikers and bikers on the new open space will run the elk off. (1 person)
- Elk will use open space as a refuge. (1 person)
- Extend PLO season into February. (2 people)

Near the end of the meeting and after much discussion, we took a straw vote on whether participants in the room wanted GMU 38 to go totally limited for elk licenses. No one raised a hand for or against.

Phone Calls

- The elk herd near Green Ranch has grown a lot. I am happy with elk numbers, but I don't want any more. The more hunters the better for hunter success because they move the elk around. Don't limit elk license numbers for bulls. There needs to be more hunters on Green Ranch to move elk.
- I am pretty happy with elk numbers, but wouldn't mind more. There are good bulls and I think there are more than 1200 elk. I like it the way it is regarding the drawing.
- I live near Green Ranch and am happy with elk numbers. There could even be more if the habitat could support them. The bull:cow ratio is OK. Do not limit bull elk license numbers. Leave it over-the-counter.
- It would be OK to limit all elk license numbers in GMU 38. I hunt GMU 38 and 39. There are too many hunters driving the roads in GMU 38. I'd like to see more elk and better quality elk while hunting.
- I am a Boone and Crockett scorer. There are plenty of big elk in GMU 38. I scored 3 that went 357, 372 and 396. It would be OK for all elk licenses in GMU 38 to be by drawing.
- Statewide there are too many elk, but I trust the CDOW with this local herd's management plan.
- I do not want GMU 38 to stop having over-the-counter rifle bull and archery licenses.

Letters

- I hope this area as well as MANY other areas become quality units. There are far too few quality elk units in the state now. (1 person)
- This area is over hunted. There are too many hunters. (1 person)
- We disagree with the statement of only 1200 elk. There are more like 2400 or more just in the area we live. Please do not make area 38 a draw only area. (2 people).
- If this area is made a draw area only then people who hunt in this area normally would not be able to hunt every other five to six years, ..., people around here depend on the elk yearly, this is our meat until the next hunting season considering meat in the grocery store is so expensive. Please do not make area 38 draw only. (1 person)
- I strongly support protecting elk on their winter range and prohibit hunting them here as well. To keep the elk herd size naturally in check, I recommend introducing wolves. (1 person)

Land Management Agency Comments

- There have been no complaints about elk from permittees or people living in the area. I do see some aspen damage, but that is normal. Idaho Springs District, USFS
- No one on our district has strong concerns or opinions about elk numbers. We are in agreement that we wouldn't want to see higher elk numbers, with decreasing habitat due to residential and recreational development. If numbers were increased we'd expect that would

increase impacts on aspen habitat -- currently some of our aspen stands have been hit hard and others have not and we probably don't want that to increase. Boulder District, USFS

- We don't want to see more elk. We see damage to aspens on Green Ranch and along Mountain Base Road. In these areas we would like less elk. Hunting on Green Ranch has helped. On the other hand, park visitors like to watch elk and they would like to see more. Golden Gate Canyon State Park
- There is very little elk pressure on White Ranch Open Space and it is a non-issue. We just purchased the Centennial Cone property and plan to remove cattle grazing which will help reduce erosion and revegetation. We are comfortable with elk numbers that we currently have. We have not noticed significant elk damage on any of our parks. Jefferson County Open Space
- There is evidence that small group(s) of elk use the west side of the park on the west sides of Bear Mountain and South Boulder Peak in winter and spring. City of Boulder Mountain Parks
- We have little elk use on Open Space and would be interested in having more elk. City of Boulder Open Space.