

SANGRE DE CRISTO DATA ANALISYS UNIT  
E-27

GAME MANAGEMENT UNITS

86, 691, 861

ELK MANAGEMENT PLAN

PREPARED FOR

THE COLORADO DIVISION OF WILDLIFE

BY

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AND  
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OCTOBER 2005



E-27 DATA ANALYSIS UNIT PLAN  
 Executive Summary  
 02/15/2006

**GMUs:** 86, 691 and 861  
**Land Ownership:** 54% private, 25% USFS, 8% BLM, 3% State  
**Current Posthunt Population: Objective:** 1450-1650 **2004 Estimate:** 1,800  
**Previous Posthunt Population Objective:** 1,400  
**Posthunt Sex Ratio (Bulls/100 Cows) Objective:** 15-20 **2004 Observed:** 6.2 **Modeled:** 11.6  
**Previous Posthunt Sex Ratio (Bulls/100 Cows) Objective:**

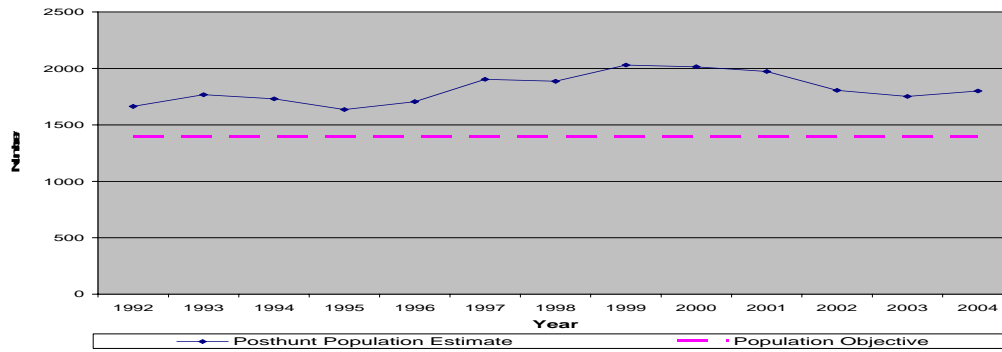


Figure 1. E-27 Posthunt Population Estimate

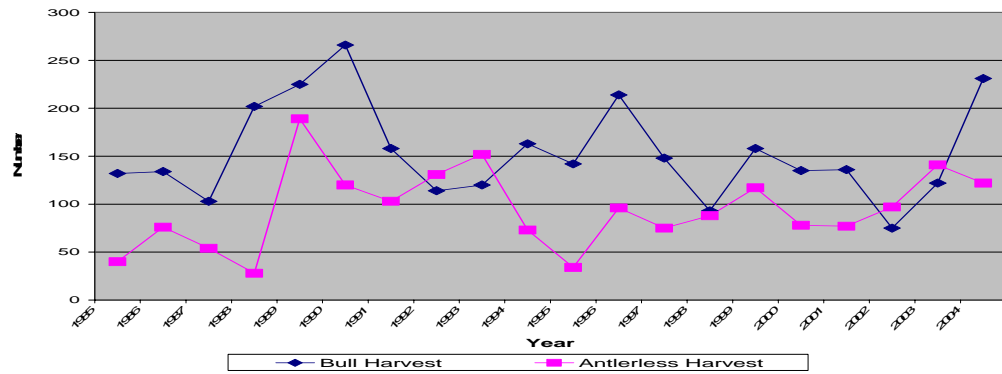


Figure 2. E-27 Harvest

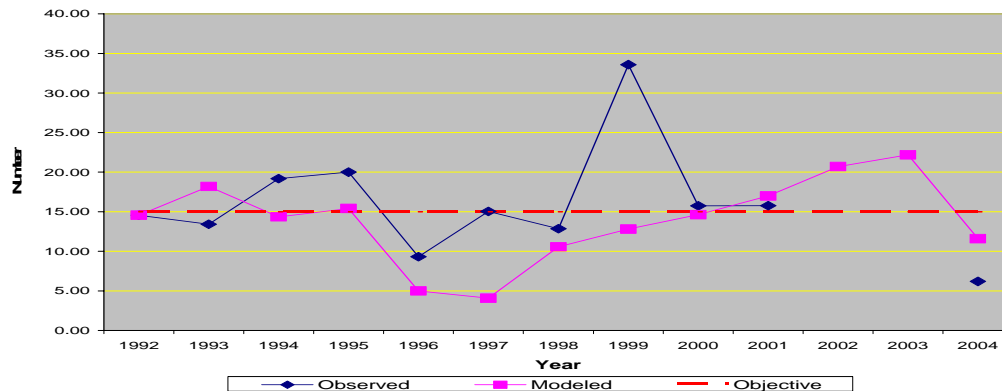


Figure 3. E-27 Posthunt Bulls/100 Cows

## **E-27 Background**

The Division of Wildlife adopted a population objective of 1,400 elk in 1987 for DAU E-27. At that time the estimated post-season population was nearly 2,100 elk. Antlerless harvest has increased in recent years in an effort to reduce the population. The 2004 post-hunt population estimate is approximately 1,825 animals.

The current sex ratio objective was also adopted in 1987 but post-season classification counts have only exceeded 20 bulls per 100 cows 1 time out of the past 15 years, which was in 1999 where our classification counts observed 33 bulls per 100 cows. The three year average post-hunt sex ratio estimate is 13 bulls per 100 cows.

Current management practices which allow a substantial antlerless harvest coupled with antler point restrictions in all seasons will allow this elk herd to remain healthy, productive and able to coexist with agricultural interests in the available habitat.

Input from the public meetings indicates a desire by the hunting public to increase the elk population dramatically over the current population objective, with most hunters preferring the “increase population by 25%” option. This was tempered by the landowners in the area that would like to see the population reduced to lessen elk competition with livestock for forage.

## **E-27 Significant Issues**

The issues and concerns identified during the public input process reveal a concern for the maintenance elk populations in the area while balancing the numbers with the available habitat in the face of increasing development and increasing demands on the elk resource.

Housing development – During the last decade this DAU has seen a rapid development of housing in areas that were once were part of elk winter ranges. Ranches have been sub-divided and natural habitats have been changed or eliminated. This includes direct loss of habitat and effective loss of surrounding habitat due to harassment from people and pets. Increased human activity in association with this development has contributed to an increased use of agricultural lands by elk, primarily in the northern end of the DAU from Hillside to Price Park, Sullivan Creek and Big Cottonwood Creek. Dispersal hunts and late elk seasons have been applied in recent years in order to help alleviate game damage in these locations. Other developed areas often provide a preserve situation during hunting seasons which often inhibits the ability to obtain cow harvest and reduces hunter opportunity. It is felt that the population of 1,550-1,650 elk could be sustained long-term. Habitat improvement projects may be necessary to distribute elk.

Maintenance of a stable population and meeting public demand for elk resources – CDOW’s objective is to maintain E-27 as a highly productive elk population that can annually support a harvest similar to those it has supported in the past. However the maintenance of population levels that are acceptable to all segments of society is very difficult to achieve. Summer ranges are often large while winter ranges are limited and most often include increased use of privately owned property. Thus, achieving a population balance that is in harmony with habitat is difficult.

Maintaining high bull:cow ratios – Increasing the current long-term sex ratio objective from 15 bulls per 100 cows to 20 bulls per 100 cows is a fairly high priority to a large segment of the public in this

DAU. Immigration of yearling bulls from the adjoining elk DAU E-28, and the required antler point restrictions in all seasons since the 2000 hunting season, and the requirement that first and fourth season licenses are limited will substantially increase the opportunity to accomplish this goal. Increasing the numbers of bulls in any game management unit that has unlimited antlered hunting is always difficult, with the hunting public's demand for mature bulls often exceeding the supply available for harvest.

Hunter crowding – Public access to National Forest land is limited and contributes to the perception (reality) of hunter crowding. Access across or upon private land is difficult to obtain. The Wet Mountain Valley generally finds agricultural producers owning 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 opportunity.

Forage competition with livestock – A few ranchers are concerned about elk on summer ranges but most concern is expressed for competition between elk and cattle for forage on privately owned range land. Habitat improvement projects are increasingly becoming more difficult due to the loss of large ranches to development and the increasing human population. Many residents often oppose the use of certain habitat manipulations (prescribed fire and timber removal). Administrative time and resources required to accomplish habitat improvement projects are increasing.

### **Recommendations to the Wildlife Commission**

The Division of Wildlife adopted a population objective of 1,400 elk in 1987 for DAU E-27. At that time the estimated post-season population was nearly 2,100 elk. Antlerless harvest has increased in recent years in an effort to reduce the population. The current sex ratio objective was also adopted in 1987 but post-season classification counts never have exceeded 22 bulls per 100 cows. Current management practices which allow a substantial antlerless harvest coupled with antler point restrictions in all seasons will allow this elk herd to remain healthy, productive and able to coexist with agricultural interests in the available habitat.

The recommended herd objective is 1,550-1,650 elk. This is above the current herd objective of 1,400 and is 175-275 less than the current estimated population. The recommended post-hunt sex ratio objective is 15-20 bulls per 100 cows. This is an increase over the current long-term post-hunt sex ratio objective of 15 bulls per 100 cows. Continuation of antler point restrictions in all seasons and the limited antlered licenses in the first and fourth seasons should help achieve this objective in the DAU.

Sportsmen favored an increase in population objective beyond what is currently being recommended. Private property issues were addressed in public meetings and this report. Game damage issues and competition with for forage between cattle were also considered. The recommended population objective of 1,550-1,650 elk will maximize opportunity while not compromise the habitat or agricultural producers' ability to make a living.

*The E-27 DAU Plan was approved by the Colorado Wildlife Commission on November 3, 2005.*

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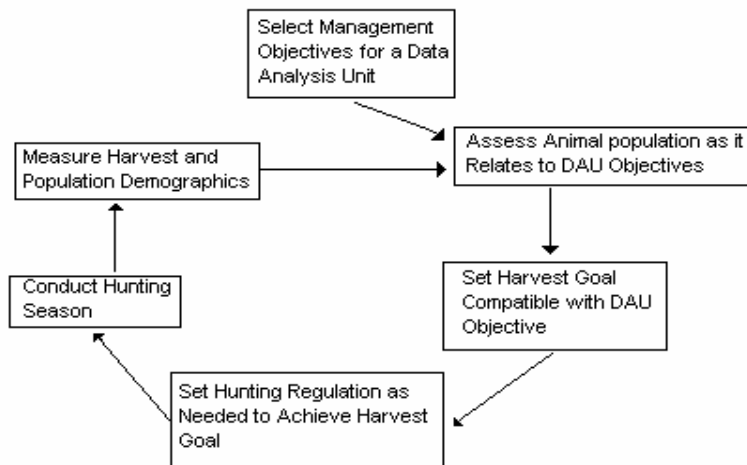
## DATA ANALYSIS UNIT PLANS

Historically, big game seasons were set by tradition and/or political whims. Seasons that resulted did not reflect what was occurring with wildlife populations or habitat. To a degree big game seasons are still traditional and/or political, but in a response to a growing demand for finite wildlife resources, the Division of Wildlife must be more accountable. Managing our wildlife resources by management objectives creates accountability. The Division's Long Range Plan provides direction and broad objectives for the Division to meet a system of policies, objectives and management plans such as the Data Analysis Unit Plan, and directs the actions the Division takes to meet the legislative and Commission mandates.

DAU's are used to manage populations of big game animals. Each DAU is established to contain a discrete population of animals utilizing geographic boundaries that minimize movements between DAU's. Each DAU may contain from one to 10 or more Game Management Units (GMU) to which specific management practices are applied to reach the DAU population and sex ratio goals.

DAU management plans are designed to support and accomplish the objectives of the Division of Wildlife's Long Range Plan and meet the publics' needs and desires for their wildlife recreation while minimizing human/wildlife conflicts.

The DAU planning process is designed to incorporate public demands, habitat capabilities, and herd capabilities into a management scheme for the big game population (Figure 4). The public, sportsmen, federal land use agencies, landowners and agricultural interests are involved in the determination of the plans objectives through goals, public meetings, comments on draft plans and the Colorado Wildlife Commission.



**Figure 4. Colorado's Object Cycle of Big Game Management and Harvest.**

Individual DAU's are managed with the goal of meeting herd objectives. This is accomplished by gathering herd data and putting it into a spreadsheet model (DEAMAN) to get a population projection. The input parameters for the model include harvest data which is tabulated from hunter surveys, sex and age composition of the herd which is acquired from aerial counts and mortality factors such as wounding loss and winter severity which are generally acquired from field observations. Once these variables are entered into the population modeling program a population estimate is obtained. The resultant computer population projection is then compared to the herd objective and a harvest is calculated to align the population with the herd objective.

# SANGRE DE CRISTO DATA ANALYSIS UNIT

## PHYSIOGRAPHY

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

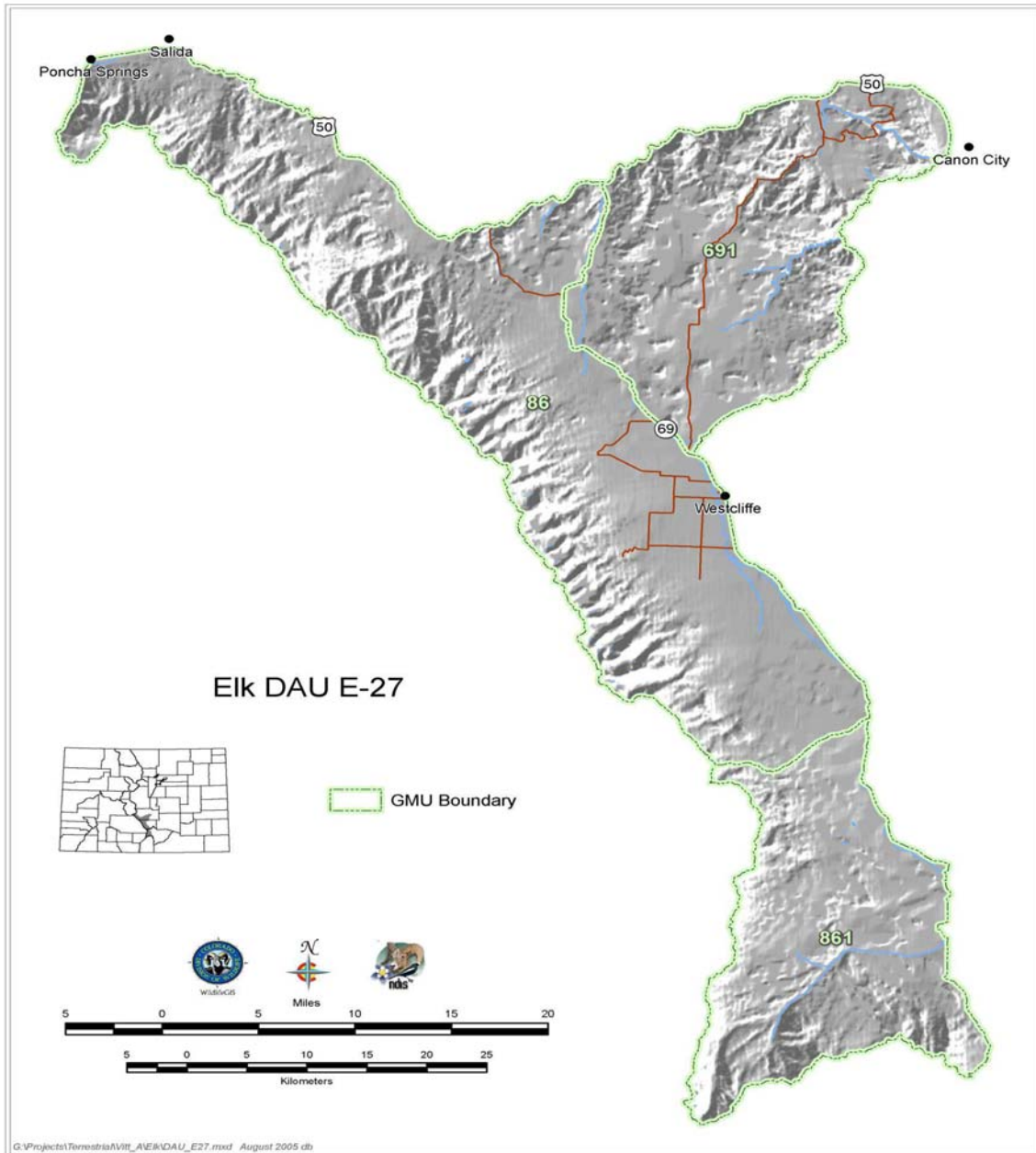
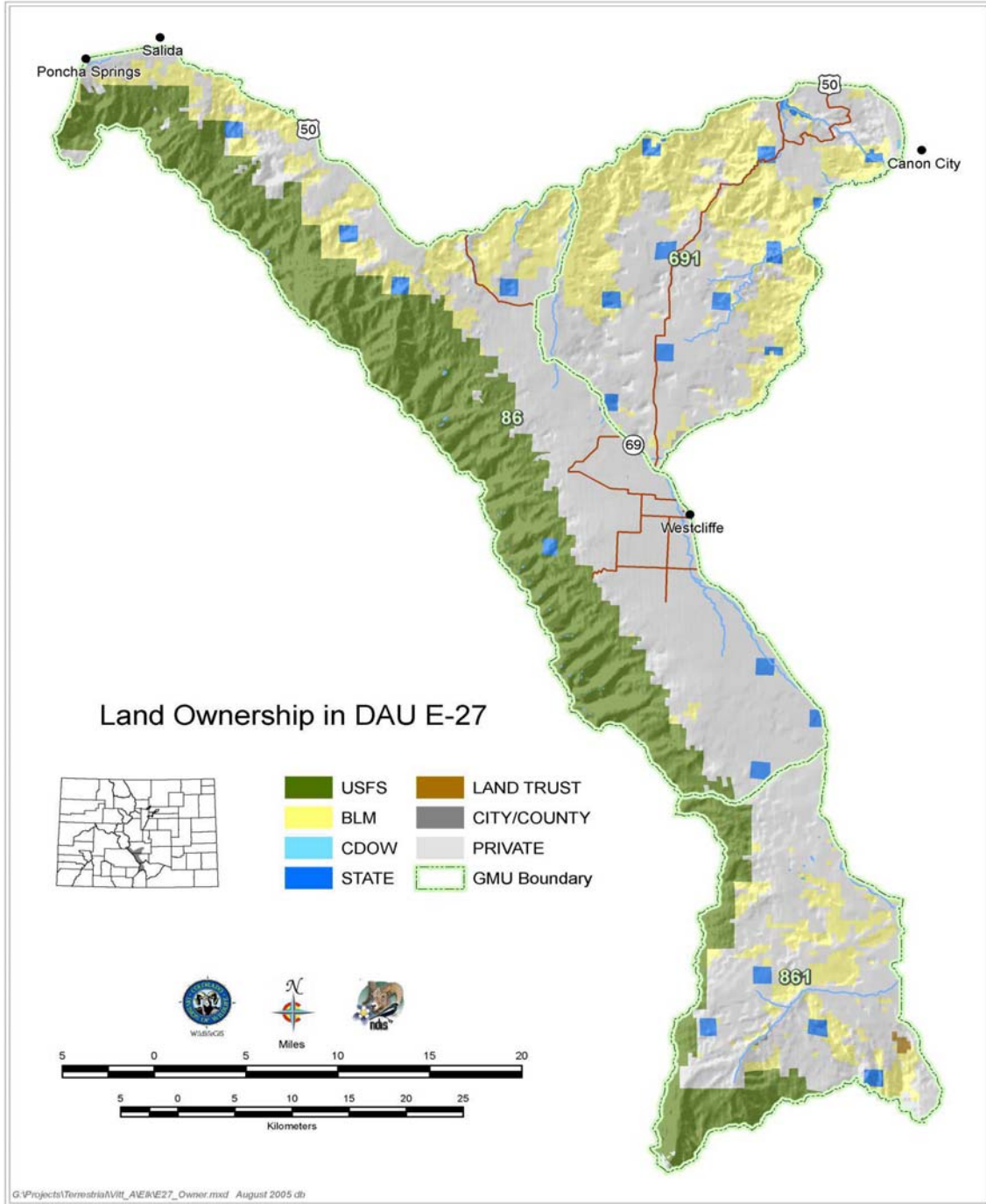


Figure 5. Elk DAU E-27

The Sangre de Cristo DAU covers 940 square miles ranging in elevation from 5,400 feet where Grape Creek flows into the Arkansas River to 14,345 feet at the summit of Mount Blanca. Topography ranges from flat hay meadows to gentle slopes, rolling hills to steep ridges and gulches to cliffs and alpine meadows. Precipitation is mainly in the form of winter snows and spring and summer rains. Alpine areas average 20+ inches of moisture a year and lower elevations 6-10 inches. Major rivers in E-27 are: Howard Creek, Cherry Creek, Hayden Creek, Lake Creek, Texas Creek, and Grape creek in Fremont County; Brush Creek, Taylor Creek, Alvarado Creek, Venable Creek, Horn Creek, Colony Creek, Grape Creek and Cottonwood Creek in Custer County; and Muddy Creek, Manzanares Creek, May Creek and the Huerfano River in Huerfano County.

Of the 940 square miles in E-27, the Division of Wildlife controls about 4 square miles (Huerfano, Taylor Creek and Lake DeWeese State Wildlife Areas) or 0.4% of the DAU, Land ownership in the rest of the DAU breaks down as follows: State Land Board 26 square miles (2.7%), Bureau of Land Management 165 square miles (17.5%), United States Forest Service 235 square miles (25%) and private ownership controls 510 square miles (54.3%). (Figure 6)



**Figure 6. Land Ownership in DAU E-27**

Approximately 80% of E-27 (752 square miles) may be classified as elk habitat of which 413 square miles are open to the public for managed hunting (Figure 7). The Division of Wildlife currently possesses the recreational lease on 4,040 acres of State Land Board property in E-27. These leased properties include Beddows Mountain (560 acres), Froze Creek (640 acres), Short Creek Baldy (640 acres), Cody Park (640 acres) and McCoy Gulch (640 acres). Predominate biotic communities are: alpine tundra, sub-alpine conifer, montane conifer, montane shrub and mountain meadow. Elk may be found in all

of these communities but are most common in the sub-alpine conifer, montane conifer and montane shrub.

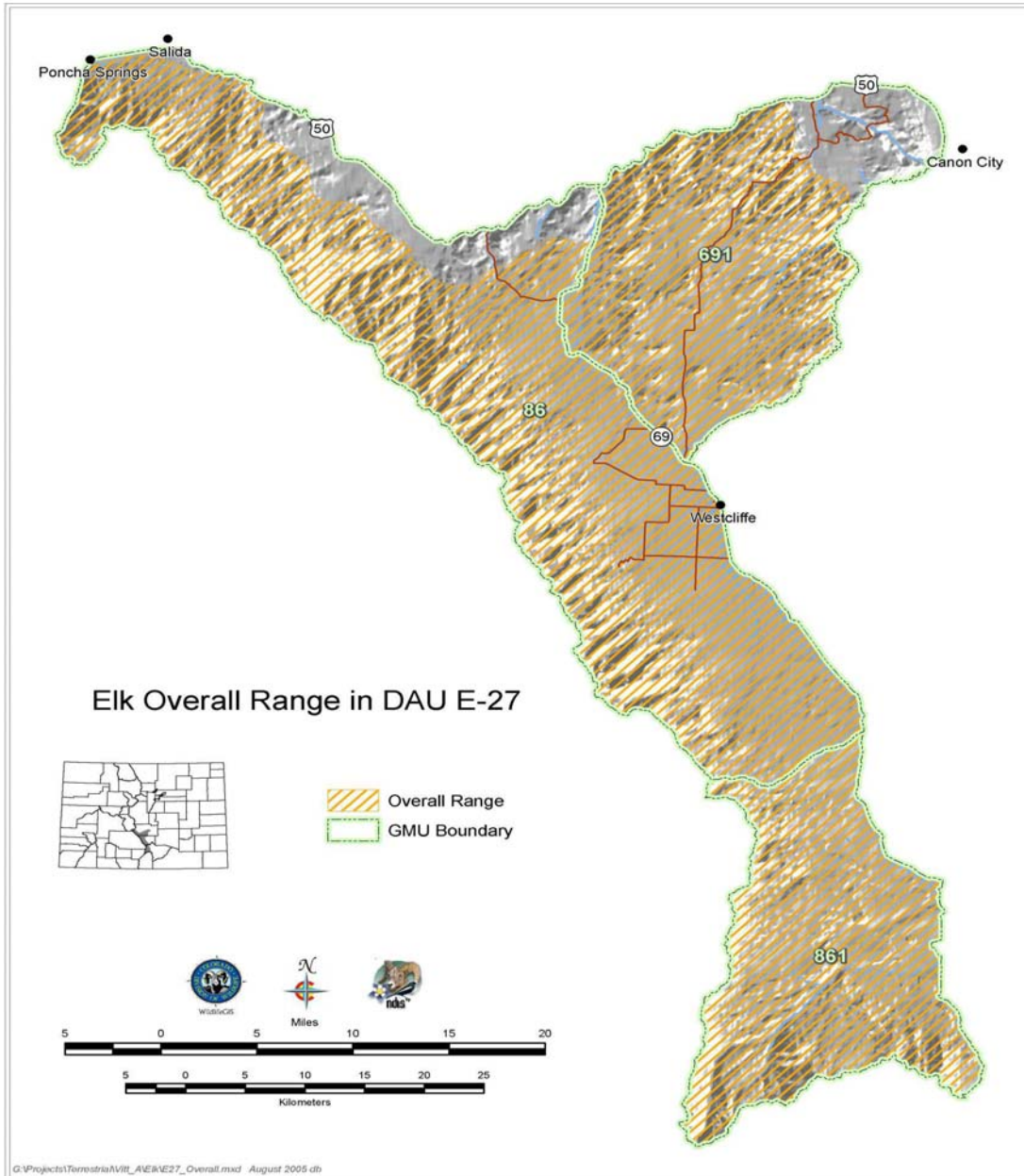


Figure 7. Elk Overall range in DAU E-27

The predominate land use in the Sangre de Cristo Elk DAU is agriculture with livestock grazing occurring on both private and public lands. Irrigated hay meadows are common in the Wet Mountain Valley, while row crops are uncommon and generally confined to very small farms at lower elevations. Geologically most of the Sangre de Cristo range is sedimentary or metamorphic in origin and not highly mineralized, thus there is little mining in GMU 86. There has been extensive historical mining in portions of GMU 691 but this has ceased since the first part of the 20<sup>th</sup> century. Due to steep slopes, lack of

mining, and private property ownership bordering Forest Service lands, there are few roads into the National Forest in GMU 86, and these roads are generally primitive. There are county roads and/or public trails that access a large portion of the BLM property in GMU 691.

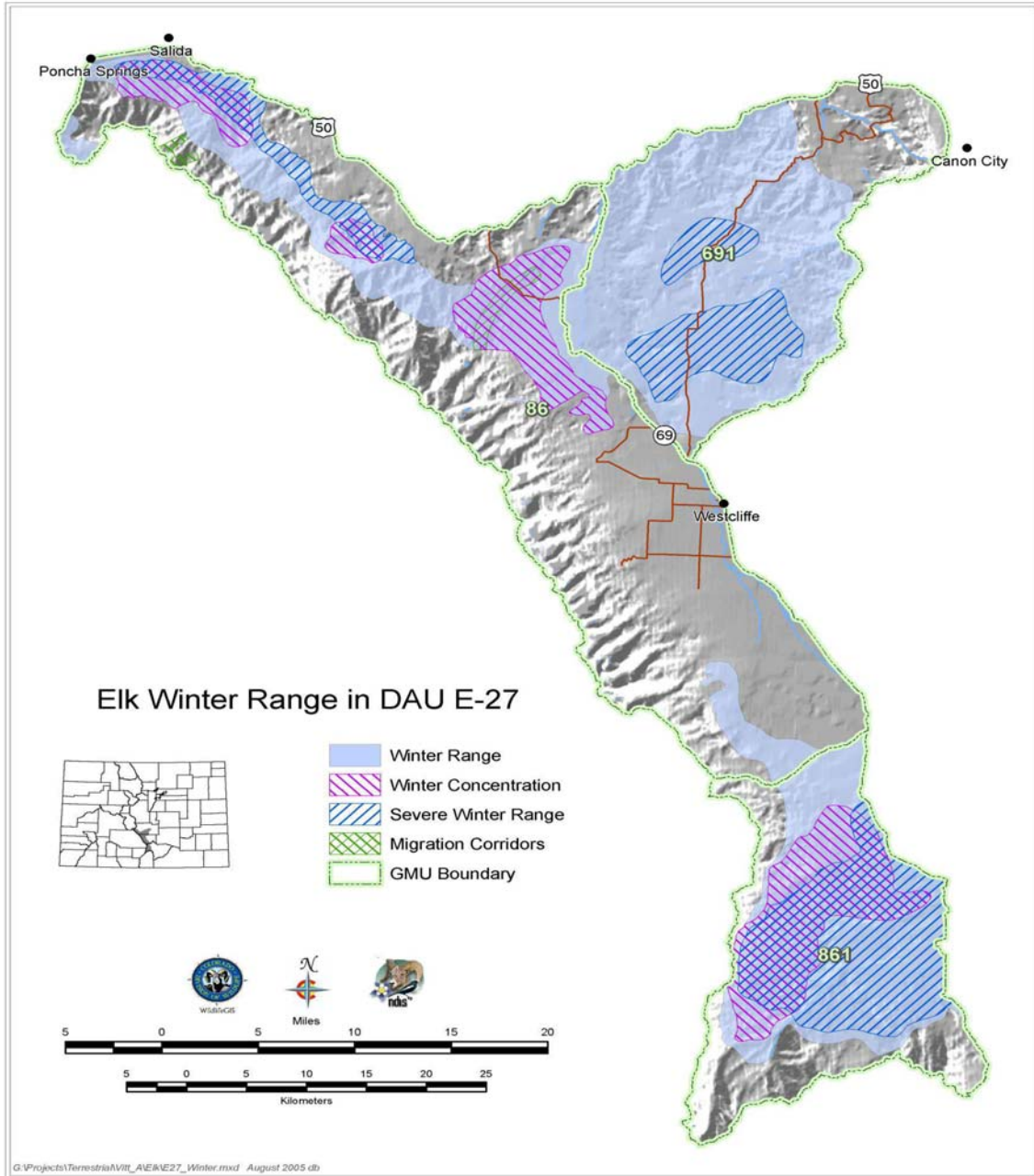
There has been some significant housing development in the past decade, mostly confined to GMU 691 around Westcliffe, Bull Domingo, Copper Gulch, Indian Springs and most areas of the DeWeese Plateau. GMU's 86 and 861 have demonstrated moderate human growth and rural lands continue to be used for agriculture. Habitat loss due to development continues to be a significant factor in this DAU.

## POPULATION DYNAMICS

### Elk Distribution

Elk generally occupy the DAU from the grassland/shrub winter range adjacent to the foothills to above timberline on the alpine during the summer months. Elk overall range in the DAU is 952 square miles, or approximately 80% of the DAU.

Elk movement to winter range is generally initiated by increasing snow cover and decreasing forage availability, along with hunting pressure. This movement generally begins in November and continues until January. The movement is generally down slope from west to east. Wintering concentrations of elk are usually found in the foothills at the southern end of GMU 861 near Mosca Pass and Medano Pass. Another winter concentration area is identified along the northern foothills of GMU 86 to Colorado State Highway 50. Winter range on the east side of the Sangre de Cristo Mountains is generally wind blown with south and east facing slopes opening up to expose winter forage. (Figure 8)



**Figure 8. Elk Winter range in DAU E-27**

Migration back to summer range usually follows the snow line with elk dispersing into the overall range of the DAU in summer and fall.

## HERD MANAGEMENT HISTORY

### Prologue

The total number of animals in a big game population fluctuates throughout the year. Normally, the population peaks in the spring just after the birth of the young.

Populations then decline throughout the year as natural mortality and hunting seasons take animals from the population. Traditionally, the CDOW uses post-hunt populations (immediately after the conclusion of the last regular hunting season, usually in late November) as a frame of reference when we refer to the size of a population of elk. In this manner we have established a reference point and can eliminate confusion when referring to populations.

Realistically, elk population objectives are determined by a combination of variables that are woven together in a manner best suited to satisfy all the demands in order to arrive at a final objective number. The variables involved include biological data, economic, political and recreational considerations, along with domestic livestock concerns and vegetative considerations to name some of the most prominent factors. Population objectives are often set at a level between the herds' maximum sustained yield (MSY) and no agricultural conflicts. However, it is very difficult to determine the ranges' MSY and carrying capacity.

Post-hunt populations referred to in this plan have been generated by computer simulation. A brief discussion concerning population assessment is contained in a *Population Assessment Procedure Overview* at the end of this section.

### Recent Herd History

Prior to 1989 the Sangre de Cristo elk DAU consisted of GMU 69 west of Grape Creek and GMU 86. In 1989 the south end of GMU 86 was given its own unit designation, GMU 861. In 1989 the area of GMU 69 west of Grape Creek was given the GMU designation 691. Data collection and limited license allocation is now more refined and accurate.

The DAU has been unlimited for antlered elk as far back as our records exist. There has been some level of antlerless harvest since the early 1970's. The number of antlerless licenses available varied from 100-150 throughout most of the 1980's and increased during the 1990's from 300 in 1990 to a high of 580 in 1994. With antlerless harvest and population objectives being met, the number of antlerless licenses available leveled off during the rest of the 1990's to 400 licenses. Due to continuing game damage concerns in unit 86 antlerless licenses were increased in 2004 from 325 to 450 licenses, these were split over the 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> combined seasons.

### Post-hunt Population Size

Post-hunt population size is defined by spreadsheet population modeling using the DEAMAN program provided by Dr. Gary White at Colorado Sate University. DEAMAN uses population and herd composition data acquired during post-hunt aerial surveys as parameters to model population changes, these parameters change as new information becomes available. Elk numbers in the Sangre de Cristo DAU increased from about 1,300 in 1980 to an estimated high of 2,100 in 1988. The herd decreased to about 1,600 after the 1999 hunting season. The population has been over the herd

objective of 1,400 since 1982, though has remained fairly steady since 1993 between 1,500 and 1,700 animals.

### Post-hunt Herd Composition

Aerial sex/age composition surveys for this DAU are available from 1983 to present. Initially, these surveys were conducted sporadically, depending on funding. However, in recent years the surveys have been done annually. These surveys, accomplished by helicopter, are designed to sample only a portion of the existing post-hunt population and determine the ratio of bulls to cows and of cows to calves. These surveys are often mistaken by the public as total counts of the population. The results are presented as the number of bulls/100 cows and the number of calves/100 cows. Usually the bull ratio is divided into yearling bulls and mature bulls. It is generally accepted that observed bull/cow ratios are lower than the real population, but calf/cow ratios are fairly accurate. Aerial surveys are subject to variability due to weather, snow cover, sample size and observers. The average cow/calf ratio observed from 1985 to 1999 was 48 calves per 100 cows, with a high of 59 in 1985 and a low of 32 in 1995. The observed bull/cow ratio from 1985 to 1999 averaged 14 bulls per 100 cows, from a low of 7 in 1990, to a high of 34 in 1999. The current long-term bull/cow ratio is 15 bulls per 100 cows. Again, it is generally accepted that observed bull/cow ratios are lower than the real population.

### Population Assessment Procedure Overview - Disclaimer

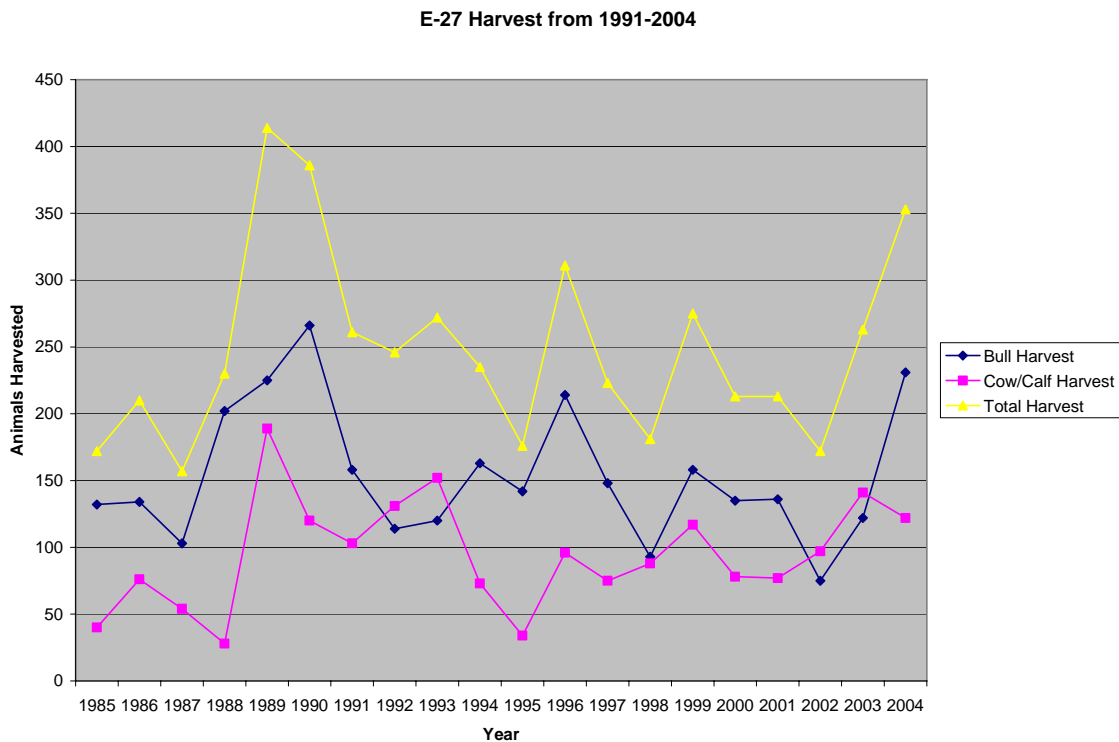
Estimating populations of wild animals over large geographic areas is an extremely difficult and inexact science. As an example, there are currently no statistically sound methods available to determine elk population densities. The CDOW, as well as other western states, is conducting research studies to try and answer these questions. There are some systems being studied that may hold promise, but the techniques are not available now. The difficulties with censuses are due to elk habitats and distribution problems. They tend to group into large herds, which play havoc with statistics and randomization. Numerous studies have attempted to accurately count all of the known number of animals in large fenced areas. All of these efforts have failed to consistently count 100% of the animals. In some cases less than 50% of the animals can be observed and counted. Highly sophisticated methods using infrared sensing have also met with very limited success. The CDOW attempts to minimize this problem using the latest technology and inventory methodology that is available today.

Our current method of determining elk populations is based upon population models, which integrate measured biological factors into a computer generated population simulation. The biological factors used include post-hunt sex and age ratio data taken from helicopter surveys in January, hunter surveys and hunter harvest information. The surveys provide baseline information, which is used to align the models. Other data requirements include winter survival information for different age classes and sexes, wounding loss and winter severity factors. As better information becomes available, such as estimates of survival rates, wounding loss, sex ratio at birth, density estimates or new modeling techniques and programs, the CDOW will use this information and the

techniques as they become available. Making these changes may result in significant modifications to the population estimate. It is recommended that the population estimates presented in this document be used only as an index or as trend data. They represent CDOW's best estimate of populations at the time they are presented.

Harvest

Harvest is affected by the number of antlerless permits issued, season structure, weather and population size. When the herds are over objective, total harvest is higher because the surplus animals along with the yearly recruitment must be taken. Elk harvests have changed very little over time in this DAU, with the historical harvest generally reflecting fluctuations in population numbers. The highest occurred in the late 1980's when the CDOW attempted to slow the growth of the elk population to meet DAU population objectives. Harvest from 1985 to 2003 ranged from a low of 157 in 1987, to a high of 414 elk in 1989 (Figure 9).



**Figure 9. Elk Harvest from 1985 to 2004**

The Sangre de Cristo DAU has had antler point restrictions in the first two combined seasons since they were started in 1986. The yearly success rate from 1991 to 2003 ranged from a low of 8.7% in 2000 to a high of 14.8% in 2001, averaging 12.59%. Hunter success rates depicted in Figure 10 are over-all success rates for all seasons and all manners of take.

Hunter success for all methods by GMU

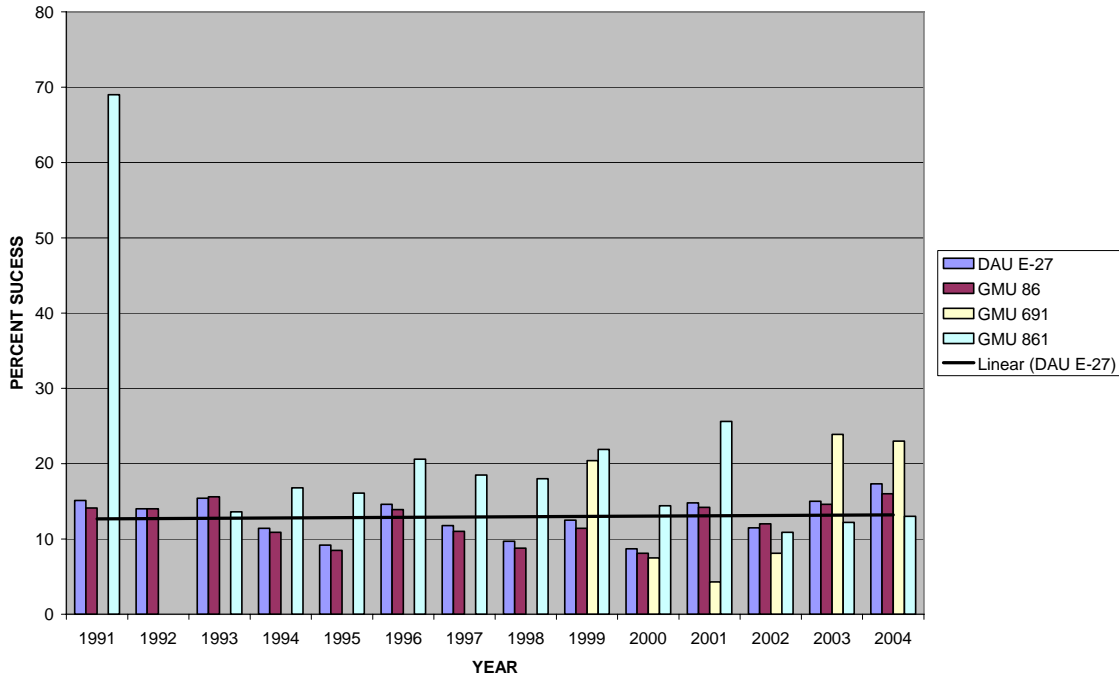
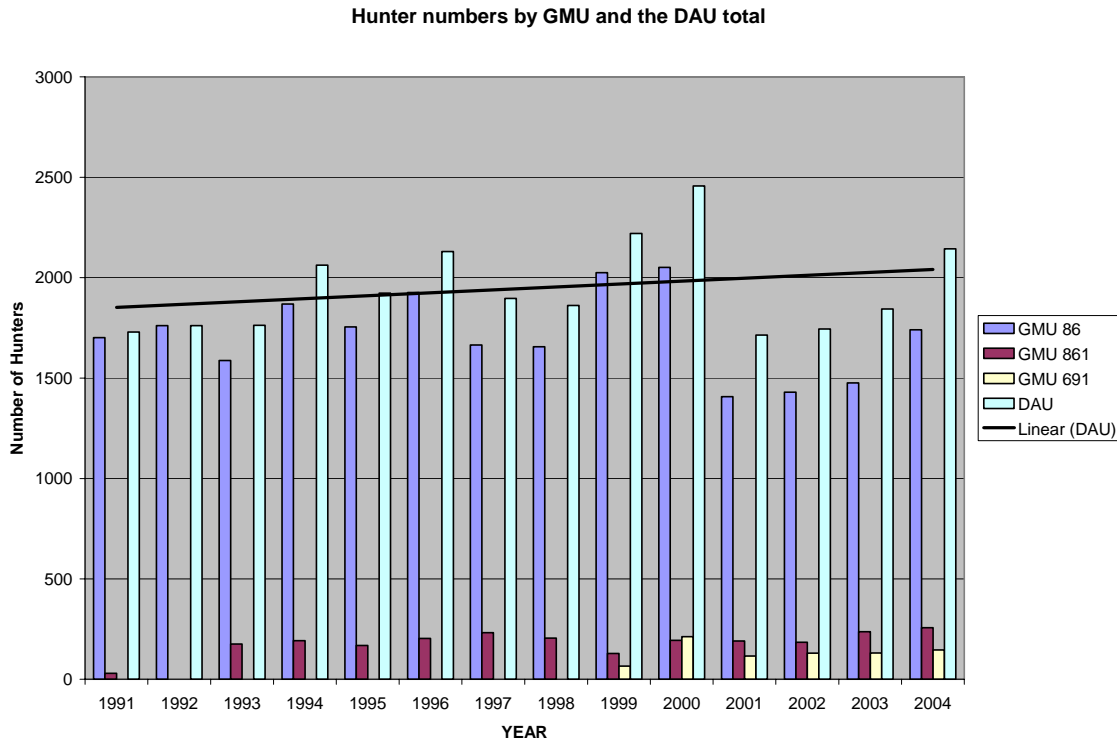


Figure 10. Hunter success by GMU from 1991 to 2004.

### Hunting Pressure

The number of hunters per year for all seasons between 1985 and 2004 ranged from a low of 1,383 in 1985 to a high of 2,457 in 2000 (Figure 11).



**Figure 11. Hunter Numbers by GMU with DAU total.**

**CURRENT HERD MANAGEMENT STATUS**

The 2003 post-season population estimate for the Sangre de Cristo DAU was approximately 1,835 elk. This estimate is above the long-term population objective of 1,400 elk. The current herd model shows that after a population high of 2,441 in 1989 the herd has been reduced and with projective harvest should reach herd objective by 2007.

Elk inventory and modeling procedures have become more refined in recent years, and the current models probably do a better job of reflecting actual herd status than the older versions. Recent research has shown that elk herds have a much higher natural annual survival than previously thought and therefore can sustain a much higher level of harvest than the earlier models predicted. It is important to remember that population modeling is an ever evolving science and with new information can change rapidly. The harvest has increased from an average of about 8% of the total population from 1980 to 1985, up to 13% from 1994 to 1999.

The current long term post-hunt sex ratio is 15 bulls per 100 cows. In 1999 the highest sex ratio of 34 bulls/100 cows was observed. Using harvest data, observed data and survival rates, the current model estimates a post-hunt ratio of a three year average of 13 bulls/100 cows.

## Issues and Strategies

The most important aspect of the DAU planning process is obtaining input from all segments of the public. In order to accomplish this, the CDOW held open public meetings in Westcliffe and Colorado City in 1999. There were 44 attendees in Westcliffe, and 7 in Colorado City. Additional meetings were held in Westcliffe and Rye in 2005. A forest fire in the region and the corresponding evacuation alert canceled the planned Rye meeting which was rescheduled for a later date. 13 people attended the meeting in Westcliffe resulting in comments from 9 people. 8 people attended the second planned meeting in Rye with comments received from 7 people. Comments from both meetings in 2005 are summarized in appendix B. Information presented included past management in E-27, the objectives of the DAU plan and several population and sex ratio alternatives for consideration.

In 1999 about 900 questionnaires were distributed to the public in an effort to sample preferences regarding the DAU objectives. We received a total of 155 responses to the questionnaire from sportsmen, landowners, environmental concerns, outfitters and interested individuals. A summary of the results of the questionnaire are presented in this report as Appendix A.

### Issues and concerns

1. Housing development – During the last decade this DAU has seen a rapid development of housing in areas that were once were part of elk winter ranges. Ranches have been sub-divided and natural habitats have been changed or eliminated. This includes direct loss of habitat and effective loss of surrounding habitat due to harassment from people and pets. Increased human activity in association with this development has contributed to an increased use of agricultural lands by elk, primarily in the northern end of the DAU from Hillside to Price Park, Sullivan Creek and Big Cottonwood Creek. Dispersal hunts and late elk seasons have been applied in recent years in order to help alleviate game damage in these locations. Other developed areas often provide a preserve situation during hunting seasons which often inhibits the ability to obtain cow harvest and reduces hunter opportunity. It is felt that the population of 1,550-1,650 elk could be sustained long-term. Habitat improvement projects may be necessary to distribute elk.
2. Maintenance of a stable population and meeting public demand for elk resources – CDOW's objective is to maintain E-27 as a highly productive elk population that can annually support a harvest similar to those it has supported in the past. However the maintenance of population levels that are acceptable to all segments of society is very difficult to achieve. Summer ranges are often large while winter ranges are limited and most often include increased use of privately owned property. Thus, achieving a population balance that is in harmony with habitat is difficult.

3. Maintaining high bull:cow ratios – Increasing the current long-term sex ratio objective from 15 bulls per 100 cows to 20 bulls per 100 cows is a fairly high priority to a large segment of the public in this DAU. Immigration of yearling bulls from the adjoining elk DAU E-28, and the required antler point restrictions in all seasons since the 2000 hunting season, and the requirement that first and fourth season licenses are limited will substantially increase the opportunity to accomplish this goal. Increasing the numbers of bulls in any game management unit that has unlimited antlered hunting is always difficult, with the hunting public's demand for mature bulls often exceeding the supply available for harvest.
4. Hunter crowding – Public access to National Forest land is limited and contributes to the perception (reality) of hunter crowding. Access across or upon private land is difficult to obtain. The Wet Mountain Valley generally finds agricultural producers owning 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 opportunity.
5. Forage competition with livestock – A few ranchers are concerned about elk on summer ranges but most concern is expressed for competition between elk and cattle for forage on privately owned range land. Habitat improvement projects are increasingly becoming more difficult due to the loss of large ranches to development and the increasing human population. Many residents often oppose the use of certain habitat manipulations (prescribed fire and timber removal). Administrative time and resources required to accomplish habitat improvement projects are increasing.

## DEVELOPMENT OF ALTERNATIVES

The primary purpose of this DAU plan is to determine long-term post-hunt population and herd composition objectives. Herd composition is determined by calf/cow and bull/cow ratios. Calf/cow ratios are determined by many environmental factors, of which wildlife managers have no control. On the other hand, bull/cow ratios can be directly controlled by management options. Listed below are a few of the many possible alternatives that could be considered to accomplish these objectives.

Each alternative includes a brief discussion of management variables that would probably occur for that population level. Generally, the lower the population objective the lower the investment needs to be in habitat improvements. As the objective increases, the larger the investment needs to be. Each habitat management practice varies in labor intensity, costs and life expectancy of the project. Individual practices that should be considered include prescribed fires, fertilization, seeding, water development, livestock exclusionary fencing, timber and brush management, travel management, and others.

Game damage problems, although closely tied to the severity of the winter, would probably decrease under the lower population alternatives, and may increase with increasing population levels. Higher population levels, on the other hand, will also support a higher hunter harvest, increase hunter opportunity and increase the fiscal benefits to local economies. A population objective that involves reducing the number of hunting licenses by 10% will also reduce the economic benefits to the state and local counties involved by approximately 10%. The population objectives below are examples of management objectives.

### Population Objective

#### **1. Maintain a population objective of 1,300-1,400.**

**General discussion** – This population is the current population objective and is about 21% below the current population.

Game Damage – Game damage problems would likely be reduced with the necessary reduction of the current population to the objective of 1,400.

Habitat Improvement – Habitat improvement projects would only be needed for distribution problems.

Season Framework – The current harvest strategy would continue through the 2007 hunting season, and then antlerless harvest would be reduced. Antlerless harvest levels and hunter opportunity would be reduced.

Fiscal Impacts- Income would increase as antlerless licenses numbers increase to reduce the population from current population levels. As the population reaches objective license numbers and therefore community income would decline.

#### **2. Increase the Population Objective to 1,650-1,750**

**General Discussion** – This objective reflects the estimated population after the 2003 hunting season and a 25% increase over the current objective. Elk numbers increased through the 1980's and early 1990's to nearly 2,500 elk. Herd reductions in the late 1990's have been more acceptable. The increase was accepted by hunters but landowners' complaints of agricultural damage persisted. The population increase with this alternative would be accomplished by a reduction in antlerless harvest.

Game Damage – Game damage problems such as damage to growing hay, native rangeland and fences may increase. Local ranchers and farmers have indicated that at these population objective levels, damage has been a concern, particularly for loss of forage on ranges and fence damage.

Habitat Improvement – Range improvements such as burning, seeding, fertilization and mechanical treatments of vegetation and reduction in competition with livestock would be necessary in order to successfully support a larger elk population. Extensive burning on summer and winter ranges would benefit elk, but may be detrimental to mule deer if extensive shrub-lands were converted to grasses.

Season Structure – Season structure could remain largely intact. Initially, the population would be increased from present levels by reducing the number of antlerless hunting licenses. Once the new objective is obtained, more licenses than are presently available would likely be necessary to hold the population at the new higher level. It would be necessary to provide late seasons and private land only licenses. An increase in hunter opportunity would be realized.

Fiscal Impacts – At higher population levels income to the state and local economies would increase by providing sustained increased harvest.

### **3. Decrease population Objective to 950-1,050**

**General Discussion** – This alternative would represent the elk population found in E-27 in about 1975. Seventy-eight elk were harvested that year. This would reduce hunting opportunity across all segments of the hunting public including archery, muzzle-loading and rifle hunters. This alternative would decrease the level of hunter satisfaction and would be contrary to the wishes of most hunters.

Game Damage – Game damage problems may be below present levels, with most damage occurring during severe winters. Landowners would notice a decrease in the size of herds and fence damage would decrease. At this level elk would possibly utilize natural forage to a greater extent and probably disperse over the winter range to a greater degree, which would reduce damage.

Habitat Improvement – At this level, winter populations would likely be closer to what the winter range might carry during severe winters. Habitat improvement projects might not be as important or could be delayed or reduced in size or number. Competition with deer would be reduced. Vegetation may recover somewhat from the current condition on winter ranges.

Season Framework – The regular season could be maintained in its present form. After the initial herd reduction to reach herd objective the late season may be eliminated. A larger portion of harvest would take place during the regular seasons. Private land only and regular season antlerless licenses would be reduced to maintain the population at a lower objective.

Fiscal Impacts – At a lower population level, license sales would be decreased. Local businesses would see a decline in hunter related income.

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

**General Discussion** – The bull/cow ratio is a result of hunting seasons that have unlimited bull, and limited cow licenses available. Antler point restrictions have been in place for the first two combined seasons since 1986; in 2000 antler point restrictions were in place for all seasons. The average observed bull/cow ratio since 1986 is about 14 bulls/100 cows. The current long-term objective is 15 bulls/100 cows. There has not been any public support for the area becoming a totally limited license area for elk.

#### **1. Maintain current post-hunt sex ratio objective of 15-20 bulls/100 cows.**

Habitat Improvement and Game Damage – This alternative would not have any effect on the habitat, the need for habitat improvement projects or game damage. Once a population objective is established, the total number of elk remains the same.

Season Framework – The season framework could remain in its current format. Antler point restrictions in all seasons would remain as approved by the Wildlife Commission for the 2000 season.

Survival Rates, Quantity and Quality of Harvest – About the same number of bulls will be available for harvest as in the past under this alternative.

Fiscal Impacts – There would be little or no change in this parameter.

**2. Increase current post-hunt sex ratio objective to 20-25 bulls/100 cows.**

Habitat Improvement and Game Damage - This alternative would not have any effect on the habitat, the need for habitat improvement projects or game damage. Once a population objective is established, the total number of elk remains the same.

Season Framework - The season framework could remain in its current format. Antler point restrictions in all seasons would remain as approved by the Wildlife Commission for the 2005 season. Antlered license numbers would be reduced in the first and fourth seasons to accomplish this goal.

Survival Rates, Quantity, and Quality of Harvest – The quality and quantity of the harvest would not likely change to a great degree. It is unlikely we would see a major change in the age structure of the bulls by only increasing from 15-20 to 20-25 bulls/100 cows. Antler point restrictions in all seasons would be in effect along with a reduction of antlered licenses in the first and fourth seasons which would protect the yearling age class by allowing young bulls to grow another year.

Fiscal Impacts – There would be little or no change in this parameter.

## Appendix A: 2000 Hunter Questionnaire Results

### Survey Purpose and Intent

The purpose of this questionnaire was to assess public attitudes toward mule deer and elk management in the Wet Mountain area, specifically in Game Management Units 69, 84, 86, 691 and 861. The Colorado Division of Wildlife (CDOW) is responsible for developing mule deer and elk population management plans for the Wet Mountains area.

In Colorado, big game populations are managed for specific geographic areas, called Data Analysis Units (DAU). The DAU plan analyzes information for two primary decisions: 1) how many animals should the DAU support, and 2) what is the herd's most appropriate male to female ratio, better known as the sex ratio. The DAU planning process examines the biological capabilities of the deer and elk herds, and public preferences. An appropriate balance of each is sought and reflected in the herd objectives, which are set for a five year period of time. Annual hunting seasons are then designed with the intent of keeping the population at or near the selected herd objectives.

Public input is an important part of the DAU planning process. It is vital that public desires are integrated into these plans so that established goals are widely accepted and biologically sound. In an attempt to maximize public input, a questionnaire was developed and distributed to interested publics.

In the development of DAU plans, results of surveys such as this one are considered along with other forms of input the CDOW receives from land management agencies and the public, via public meetings, letters, phone calls, and testimony before the Colorado Wildlife Commission. All public input is integrated with other significant elements in making the final selection of a preferred alternative for population and composition (male/female ratios) objectives for the deer and elk herds in GMUs 69, 84, 86, 691 and 861. The Colorado Wildlife Commission makes final determination on the herd objectives which will then be in effect for five years.

### Methods

The target population for the study consisted of residents of the Wet Mountain area, individuals owning land in the Wet Mountain area, and individuals who hunted deer and/or elk in the Wet Mountain area.

Surveys were distributed by Area-11 officers in the field during all the fall deer and elk hunting seasons in the appropriate GMUs. Surveys were also distributed to landowners by District Managers. Several license agents in Colorado City, Beulah, and Westcliffe, Colorado made the surveys available to their customers. Custer County courthouse was also a distribution site. Three volunteers from the DOW volunteer program distributed surveys to hunters during all the opening days of the fall rifle seasons. The Pueblo Service Center also made surveys available to customers.

All surveys had a postage paid envelope attached with instructions for return mailing. 928 questionnaires were distributed within the appropriate GMUs. 155 questionnaires were completed and returned for a response rate of 16.7%.

**Note:** This survey effort is not a "scientific study" in the strictest sense of the term. While efforts were made to obtain a significant mix of residents, landowners, and hunters, the sample is not a representative cross-section of the target population. "Representativeness" refers to the

extent to which relevant populations were included in a study and whether or not a probabilistic sampling scheme was used.

### **Results**

Results are presented in two sections. “Survey Highlights” summarizes the important results of this survey, particularly as they apply to the DAU plan objectives. The “Summary of Open-ended Comments” categorizes the additional comments received and provides insight into the main issues that people thought were important for the CDOW to consider.

The actual results of the survey may be reviewed at the Pueblo Service Center by contacting Allen Vitt, Terrestrial Biologist at 719-561-5306.

## **SURVEY HIGHLIGHTS**

### **ABOUT THE RESPONDENTS**

- X Of the 155 respondents, 96% are Colorado residents and 4% are non-residents.
- X Of the 155 respondents, 71% live in the DAU's listed, for an average of 22 years. 61% own or lease property in the DAU's, with an average of 1447 acres.
- X Fifteen percent own a business in the DAU's and 33% ranch or farm the property they own. Three percent of respondents either guide or outfit.
- X Ninety-seven percent were male, and 56% of respondents were 41-60 years of age (33% were younger than 41 and 11% were older than 60).
- X Ninety-five percent of respondents identified themselves as hunters, and 89% identified themselves as fishermen.

### **Sangre de Cristo Data Analysis Unit**

1. People are very interested in seeing elk in Units 86, 691 and 861 (78%) and in hunting elk(56%). Half of the respondents indicated they were very interested in learning more about elk management in the Sangre de Cristo elk area and 49% were very interested in providing input into the management decision process.
2. People are most concerned about the reduction in elk habitat due to increased human population and development (57%), winter starvation (42%) and predators (34%).
3. Sixty-nine percent of respondents enjoy the presence of elk and do not worry about problems elk may cause, whereas 23% enjoy elk but worry about potential elk-caused problems.
4. The majority of respondents wanted a "moderate" (41%), or "great" (20%) increase in the elk population; 17% wanted a "slight" increase; and 6% wanted "no change". The average rating indicated a "moderate" increase. In this survey a moderate increase was rated as a 26-50% increase.
5. Forty-seven percent of respondents wanted to see a "moderate" increase in the number of bull elk in Units 86, 691 and 861; 42% wanted a "great" increase and 10% wanted "no change".
6. Thirty-two percent of respondents rated the overall success of CDOW's elk management in GMU's 86, 691 and 861 as "poor" to "fair" and 46% felt we were doing a "good" to "excellent" job.
7. Ninety percent of respondents hunted elk in Colorado with an average of 16 years. Of those, 63% have hunted elk in GMU's 86, 691 and 861 for an average of 6 years.
8. The level of satisfaction with past hunting experiences in GMU's 86, 691 and 861 was rated as 38% dissatisfied, as compared to 44% satisfied. Eighteen percent of respondents remained neutral.
9. The quality of elk hunting opportunities in GMU's 86, 691 and 861 was rated as "fair" by 36% of respondents, "good" by 38%, "very good" by 11%, "excellent" by 2%, and 6%

had no opinion. 10 % of respondents felt the quality of elk hunting opportunities was rated as poor. The average rating was 3.0, which equaled a “good” score.

10. The most important factor when hunting elk in Units 86, 691 and 861 was for “obtaining meat”, as selected by 66% of respondents. Twelve percent selected “get a trophy”, and 12% chose “few contacts with other hunters”.
11. 60% of respondents support keeping unlimited bull licenses available in the Sangre de Cristo elk area while 23% oppose unlimited bull licenses in the area.

## SUMMARY OF OPEN-ENDED COMMENTS

At the end of the questionnaire, people were asked to provide additional comments they would like to make about elk and mule deer in south-central area. Numerous comments were received. These comments provide insight into the main issues that are important to people in deer and elk management. The comments were analyzed by categorizing them into like groups and reporting the number of comments in each group. Comments were grouped into 13 categories, reported below; the number of comments received for each category is enclosed by parentheses. The categories are listed in descending order based on the number of comments received. A few of the typical responses are highlighted by arrows.

1. Issues that affect hunting opportunity such as changes in hunting regulations, licensing, quality aspects. (47 comments)

% Don't restrict in-lines unless bows are restricted to long bow only.

% I think we need antler point restrictions in all seasons not just in one or two.

% I would like to reduce the number of deer licenses even more.

% I support DOW decisions in order to bring deer back to 1984 levels.

2. Hunting access issues, including the use/misuse of all-terrain vehicles. (28 comments)

% ATV use is a problem, the government is not enforcing ATV laws.

% Open more roads, fix roads don't close them, we can't use roads to get game out.

% Landowners don't let you hunt but still complain about damage.

% Too many elk on private land, won't move out to public land.

3. Elk population issues (24 comments)

% No chance for elk to grow to trophy size when licenses are unlimited.

% Ratios need to increase to ensure quality hunts.

% Bull/cow ratio is not that much out of balance so why consider limiting licenses?

% We have abundant cows but few mature bulls.

4. Elk license limitation issues (22 comments)

% I like the guarantee of being able to hunt in unlimited license areas.

% Scientific management should determine whether limited or unlimited licenses are available.

% A limited draw would increase bulls and quality.

% It's already too difficult to draw. There are too many draw areas already.

5. Deer population issues (15 comments)

Most of the deer comments were related to the decline in the population and a desire to see the population increase to levels seen in past years. There was little concern about problems deer may cause.

% DOW should study why elk are doing well on private property but deer are not.

% Unit 69 deer have decreased greatly the last 5 years. Its hard to even find a buck.

% Eliminate the third buck season when they are most vulnerable.

6. Issues related to the quality and quantity of deer and elk habitat (13 comments)

% Development of 40 acre tracts give elk a place to hide with no hunting allowed.

% Use GOCO money for land purchases, development is taking up all the land.

% Burning timber is needed to provide habitat.

% Spend more money on habitat.

7. Miscellaneous Comments (13 comments)

% I hope biological data takes precedence over public opinion.

% Colorado needs to not worry about how much money non-residents bring in.

% There is too much emphasis on the money aspect of management.

8. Mule deer limited license issues (11 comments)

% Restrictions on deer hunting has helped the buck/doe ratio.

% Deer hunting should be unlimited with 4 point restriction statewide.

% Close the season for 3 years and decrease licenses another 25-30%.

% Eliminate the 3rd deer season and shorten archery season. Hunters and predators have decreased the deer population.

9. Issues relating to predator control and how it may impact deer and elk populations (9 comments)

There is concern that predators including coyotes, mountain lion and black bear, are killing a significant portion of the deer population. The general feeling is that the CDOW should take action to reduce the number of predators.

% Coyote population needs to be reduced, perhaps add bounties.

% Manage the cats, open bear hunting to hounds and baits.

10. Some residents feel that non-resident licenses should be limited in some manner (9 comments)

% Too many non-resident tags for the number of resident tags. Take care of residents first.

11. Some landowners and local residents prefer a preference system in obtaining a deer or elk license (7 comments)

% The drawings are fixed for non-residents just for the money. Residents pay taxes and should reap the benefits first. We need a resident only first season.

% There are too many non-residents in unlimited areas. Have a drawing for non-residents.

12. Wildlife Ranching issues and concerns (4 comments)

% RFW allows rifle during the rut. That is wrong. The landowner and outfitter get rich off the system.

% RFW has depleted the number of bulls.

% Don't like RFW in limited units. It allows an individual to harvest what everyone else has helped to achieve.

13. Issues related to public land management and impacts to hunting (2 comments)

% Why do cattle have to be everywhere in Unit 84? They are out for rifle season, they should be out for archery season as well.

% Need fewer restrictions on SLB property. These lands should be open as they are on USFS lands.

## Appendix B: 2005 Hunter Questionnaire Results

### 2005 SURVEY HIGHLIGHTS

#### ABOUT THE RESPONDENTS

- X Of the 16 respondents, 94% are Colorado residents and 6% are non-residents.
- X Of the 16 respondents, 81% live in the DAU's listed, for an average of 29.5 years. 88% own or lease property in the DAU's, with an average of 2319 acres.
- X Thirty-one percent own a business in the DAU's and 43% ranch or farm the property they own. Nineteen percent of respondents either guide or outfit.
- X Eighty-one percent were male, and 50% of respondents were 41-60 years of age (26% were younger than 41 and 20% were older than 60).
- X Eighty-eight percent of respondents identified themselves as hunters, and 88% identified themselves as fishermen.

#### Sangre de Cristo Data Analysis Unit

- X People are very interested in seeing elk in Units 86, 691 and 861 (77%) and in hunting elk (54%). More than half of respondents (61%) indicated they were "very interested" in learning more about elk management and (46%) were very interested in providing input into the management decision process.
- X People are most concerned about the reduction in elk habitat due to increased human population and development (84%), winter starvation (62%), and the revenue that elk hunting and viewing provides for local businesses (54%).
- X Sixty-four percent of respondents enjoy the presence of elk and do not worry about problems elk may cause, whereas 28% enjoy elk but worry about potential elk-caused problems.
- X The majority of respondents wanted "no change" (36%), or "slight" (21%) to "moderate" (21%) increase in the elk population; 14% wanted a "moderate" decrease. The average rating indicated a "slight" increase. In this survey, a slight increase was rated as a 1-25% increase.
- X Sixty-four percent of respondents wanted to see a "moderate" (50%) or "great" (14%) increase in the number of bull elk in Units 86, 691 and 861.
- X Seventy-one percent of respondents rated the overall success of CDOW's elk management in GMU's 86, 691 and 861 as "good" (50%) to "very good" (21%) and 14% felt we were doing a "poor" (7%) to "fair" (7%) job.
- X Seventy-one percent of respondents hunted elk in Colorado with an average of 13.5 years. Of those, 30% (3) have hunted elk in GMU's 86, 691 and 861 for an average of 14.3 years.
- X The level of satisfaction with past hunting experiences in GMU's 69 and 84 was rated as

66% “somewhat” satisfied, as compared to 33% “very” satisfied.

- X The subject of crowding was even with one respondent indicating they felt “slightly” crowded; another felt “not at all” crowded; and the other felt “moderately” crowded.
- X The quality of elk hunting opportunities in GMU’s 86, 691 and 861 was rated as “very good” by 2 of the respondents, and “good” by the third.
- X To “get a trophy”, “few contacts with other hunters”, and “obtaining meat” each got one vote as the most important factor when hunting the Sangre de Cristo elk area.
- X The three hunters indicated that they either “strongly oppose” (2) or “somewhat oppose” (1) keeping unlimited bull licenses available within the Sangre de Cristo elk unit

## SUMMARY OF OPEN-ENDED COMMENTS

At the end of the questionnaire, people were asked to provide additional comments they would like to make about elk and mule deer in south-central area. Numerous comments were received. These comments provide insight into the main issues that are important to people in deer and elk management. The comments were analyzed by categorizing them into like groups and reporting the number of comments in each group. Comments were grouped into 13 categories, reported below; the number of comments received for each category is enclosed by parentheses. The categories are listed in descending order based on the number of comments received. A few of the typical responses are highlighted by arrows.

1. Issues that affect hunting opportunity such as changes in hunting regulations, licensing, quality aspects.
  - a. I would like to see fewer seasons, one long season.
  - b. I do not want the number of permits to outfitters increased. I don't think outfitters have a vested interest in the land or the game.
  - c. There should be PLO licenses available to people that hunt only on private land.
2. Hunting access issues, including the use/misuse of all-terrain vehicles.
  - a. Hunters should be able to access USFS lands through Pueblo Mountain Park, right now guns are not allowed in the area.
3. Elk population issues
  - a. Present elk numbers are creating tremendous spring agriculture and fence damage.
  - b. Over the counter bull licenses and draw cow licenses have left landowners with few bulls to sell and large herds of cows causing us to reduce domestic livestock stocking rate to share grass with elk.
4. Elk license limitation issues
  - a. You need to decrease numbers and killing cows won't do that, you need to give over-the-counter cow licenses.

## **APPENDIX C: 2005 Press releases announcing public meeting on DAU plans**

**Contact Name:** Michael.Seraphin

**Contact Phone:** 719.227.5211

### **WET MOUNTAIN GAME MANAGEMENT MEETINGS**

EDITORS: THIS COPY REPLACES THE EARLIER VERSION... PLEASE NOTE DATE CHANGE FOR MEETING IN RYE.

The Colorado Division of Wildlife (DOW) is holding public meetings to discuss deer and elk management for the Wet Mountains and the east side of the Sangre deCristos..

Meetings will be held in Rye on July 11 at the Rye Fire Station at Boulder and Main and in Westcliffe on July 13 at the Custer County High School. Both meetings are 7-9 p.m.

The DOW manages big game hunting by dividing specific areas into what are known as Data Analysis Units or DAU's. Those large areas are further divided into smaller geographical areas called Game Management Units or GMU's.

The purpose of these meetings is to discuss the management of deer and elk in GMU's 69, 84, 86, 691 and 861.

This is a continuation of the DAU planning process and is a chance for public opinion to be incorporated into the DOW herd planning process. Items that will be discussed are the herd population and herd composition objectives that will govern license setting and policy issues for the next ten years.

People who cannot attend the meetings can send written comments to Allen Vitt at the DOW at 600 Reservoir Rd., Pueblo, CO 81005.

*For more news about Division of Wildlife go to:*

*<http://wildlife.state.co.us/news/index.asp?DivisionID=3>*

*For more information about Division of Wildlife go to: <http://wildlife.state.co.us>.*

**Contact Name:** Michael Seraphin – Colorado Division of Wildlife  
**Contact Phone:** (719)227-5211

## **PUBLIC MEETING RE-SCHEDULED IN RYE**

The Colorado Division of Wildlife (DOW) has re-scheduled a public meeting to discuss deer and elk management for the Wet Mountains on August 16. The original meeting was postponed due to the Mason-Gulch forest fire.

The location of the meeting is the Rye Fire Station at Boulder and Main. Start time is 7 p.m.

The DOW manages big game hunting by dividing specific areas into what are known as Data Analysis Units or DAU's. Those large areas are further divided into smaller geographical areas called Game Management Units or GMU's.

The purpose of these meetings is to discuss the management of deer and elk in GMU's 69, 84, 86, 691 and 861.

This is a continuation of the DAU planning process and is a chance for public opinion to be incorporated into the DOW herd planning process. Items that will be discussed are the herd population and herd composition objectives that will govern license setting and policy issues for the next ten years.

People who cannot attend the meeting can send written comments to Allen Vitt at the DOW at 600 Reservoir Rd., Pueblo, CO 81005.

*For more news about Division of Wildlife go to:*  
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*For more information about Division of Wildlife go to:* <http://wildlife.state.co.us>.

*Sangre de Cristo Committee  
Habitat Partnership Program  
600 Reservoir Road  
Pueblo, CO 81005*

**November 9, 2005**

To: Colorado Wildlife Commission

From: The Sangre de Cristo HPP committee

RE: Support of DAU Plans E-27, E-28 and D-34

Dear Wildlife Commissioners,

At our regular meeting the Sangre de Cristo HPP committee, we reviewed the DAU plans and analysis of herd objectives and offer our support for the changes in DAU population and sex ratios as presented below:

D-34 Current estimated population: 16,700  
Current population objective 22,000 : Proposed objective 16,500-17,500  
Current sex ratio 20 bucks per 100 does : Proposed objective 20-25 bucks per 100 does

E-27 Current estimated population: 1,800  
Current population objective 1,400 : Proposed objective 1,450-1650  
Current sex ratio 15 bulls per 100 cows : Proposed objective 15-20 bulls per 100 cows

E-28 Current estimated population: 1,585  
Current population objective 1,600 : Proposed objective 1,400-1600  
Current sex ratio 40 bulls per 100 cows : Proposed objective 35-40 bulls per 100 cows

Based on the diversity of our committee members experience levels, we feel qualified in recommending that the elk social carrying capacities have now been achieved. Therefore, we would not support future recommendations for proposed increases in the elk population over the next 5-year review period.

Sincerely,

JOHN STROH II  
Committee Chair

cc: AWM A. Trujillo, Area 11  
Terrestrial Biologist A.Vitt  
Sangre de Cristo HPP Committee