GRAPE CREEK DATA ANALYSIS UNIT
E-28

GAME MANAGEMENT UNITS

69, 84

ELK MANAGEMENT PLAN

PREPARED FOR

THE COLORADO DIVISION OF WILDLIFE

BY

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AND

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OCTOBER 2005

E- 28 DATA ANALYSIS UNIT PLAN
Executive Summary
11/11/2005

GMUs: 69 and 84
Land Ownership: 61% Private, 25% USFS, 9% BLM, 5% State
Current Posthunt population Objective:1,400-1,600
Previous Posthunt Population Objective: 1600 **2004 Estimate:**1,585
Current Posthunt Sex Ratio (Bulls/100Cows) Objective: 35-40 bulls: 100 cows
Previous Posthunt Sex Ratio (Bulls/100 Cows) Objective: 40 **2004 Observed:** 27 **Modeled:** 32

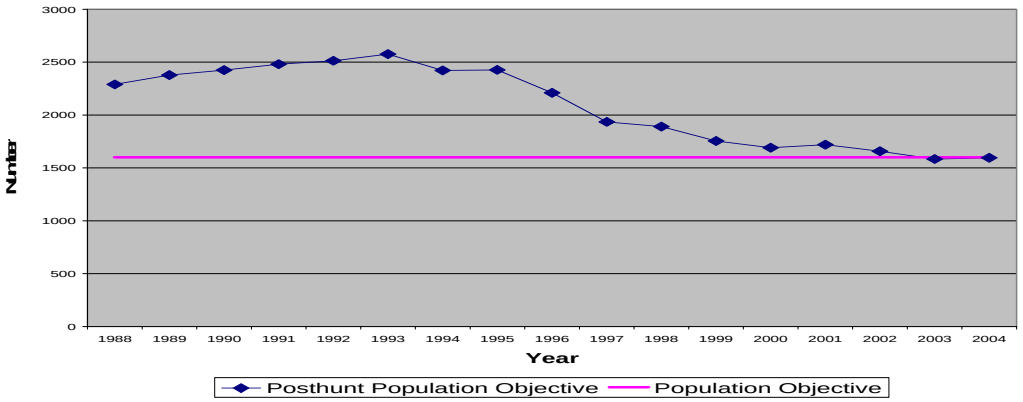

Figure 1. E-28 Posthunt Population Estimate

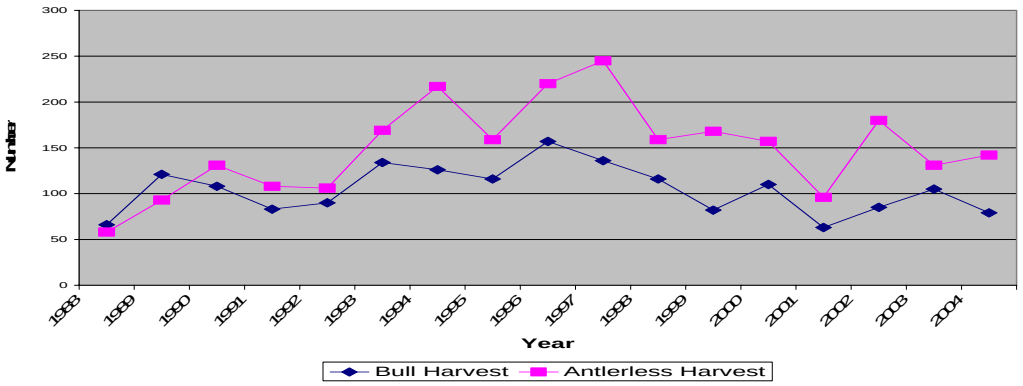

Figure 2. E-28 Harvest

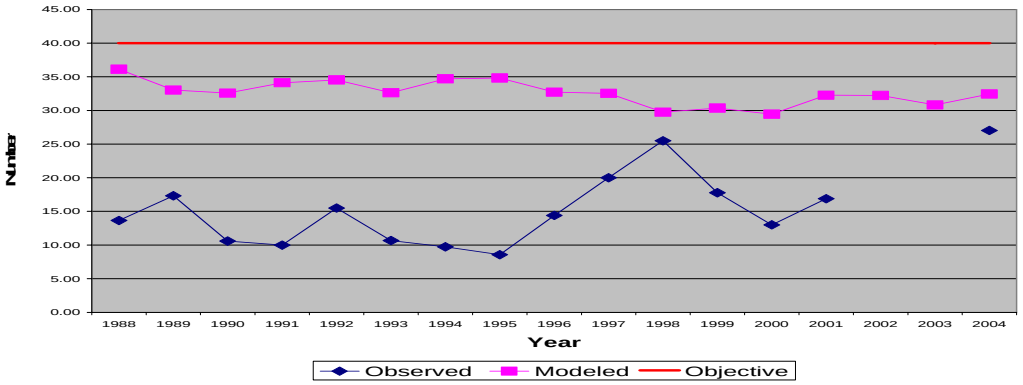

Figure 3. Posthunt Bulls/100 Cows

E-28 Background

The Division of Wildlife adopted a population objective of 1,500 elk in 1987 for DAU E-28. At that time the estimated population was nearly 2,000 elk. Antlerless harvest has increased in recent years in an effort to reduce the population. The current post-hunt population estimate is approximately 1,570 animals.

The current sex ratio objective was also adopted in 1987 but post-season classification counts have never exceeded 26 bulls per 100 cows. The current post-hunt sex ratio is modeled at 34 bulls/100 cows (2004 post-season). The highest observed ratio of 27 occurred in 2004.

Current management practices which totally limit the number of elk licenses available for all manners of take will allow this herd to maintain its status as a quality unit providing opportunity to harvest mature trophy quality bulls. Periodic adjustments in antlerless harvest will be necessary to maintain population stability and coexistence with agricultural interests in the available habitat.

Questionnaire returns from the hunting public supported a population increase and maintenance of completely limited licenses. Landowners had concerns with any increase in population impacting their livelihood and had concerns over increasing game damage.

E-28 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 – This DAU has in the last decade seen a rapid development of housing in areas that once were part of elk ranges. Ranches have been subdivided 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. This development has combined to reduce the amount of useable winter range. The projected population of this elk DAU remained at nearly 2,400 elk from 1987 to 1995. That population exceeded the long-term objective of 1,500 elk and has since been reduced. It is felt that a population of 1,600 elk could be sustained long-term, a population that is 800 head fewer than estimated through the late 1980's and into the mid-1990's. Habitat improvement projects may be necessary to off-set the habitat loss due to development.

Maintaining high bull/cow ratios – The management of quality trophy opportunities on public and private lands is very important to a large segment of the public in this DAU. CDOW's objective is to maintain E-28 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 the society, along with one that is in balance with its habitat is very difficult to achieve.

Hunter Crowding – There is significant support to maintain this DAU as a quality elk area with totally limited licenses for elk hunters. The number one reason given by the public when asked why this DAU should not be unlimited is due to the hunter crowding issue. While some individuals feel there are too many hunters in the DAU already, most feel hunter crowding is not

an issue at this time and want to maintain the quality of the hunting experience by not significantly increasing the number of hunters. There are concerns that access across or onto private property limits opportunity and concentrates hunters.

E-28 Management Alternatives

Three post-hunt population objectives are being proposed for E-28 (1) 1,250-1,350 (2) 1,500-1,700 (3) 2,150-2,250. The Division does not recommend managing for more than 2,000 elk because of habitat and damage concerns.

Sex ratio objectives presented to the public were as follows: Maintain current post-hunt sex ratio objective of 35-40 bulls/100 cows. Increase current post-hunt sex ratio objective to 40-45 bulls/100 cows. Decrease the Post-hunt Sex Ratio to 25-30 bulls/100 cows. Any increase in sex ratio objective would require a further reduction in antlered license numbers. There were no comments on raising the sex ratios so license numbers should not be affected.

CDOW Recommendations to the Wildlife Commission

Population Objective

The CDOW recommendation is to manage this elk population within the range of 1,400-1,600 animals. This represents the previous population objective and the current population estimate falls within this range. 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 for forage with cattle were also considered. The recommended population objective of 1,400-1,600 elk will maximize opportunity while not compromise the habitat or agricultural producers' ability to make a living.

Sex Ratio

Most people did not express a preference for a change in sex ratio objectives. The CDOW recommendation is to manage the sex ratio objective within a range of 35-40 bulls: 100 cows. This represents no change in the current sex ratio objective and is slightly above the 2004 estimated sex ratio of 33 bulls: 100 cows.

Management Strategy

The DAU management strategy recommendation by the CDOW is status quo. Current management practices which totally limit the number of elk licenses available for all manners of take will allow this herd to maintain its status as a quality unit providing opportunity to harvest mature trophy quality bulls. Periodic adjustments in antlerless harvest will be necessary to maintain population stability and coexistence with agricultural interests in the available habitat.

The -28 DAU Plan was approved by the Colorado Wildlife Commission in November 3, 2005.

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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.

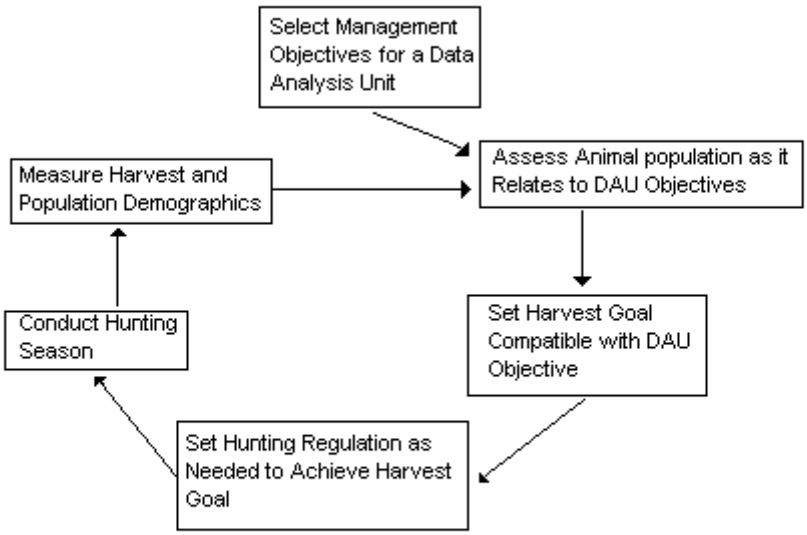

Figure 4. Colorado's Object Cycle of Big Game Management and Harvest

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.

GRAPE CREEK DATA ANALYSIS UNIT

PHYSIOGRAPHY

The Grape Creek Elk Data Analysis Unit is located in south central Colorado and comprised of Game Management Units (GMU's) 69 and 84 (Figure 5). It lies within portions of Custer, Fremont, Huerfano, and Pueblo Counties and is bounded on the North by U. S. Highway 50; on the east by Interstate 25; on the south and west by Colorado Highway 69. This DAU covers 1,831 square miles ranging in elevation from 12,349 feet at the summit of Greenhorn Peak to about 4,640 feet where the Arkansas River flows under I-25. Topography ranges from fairly flat grasslands to steep foothills with cliffs. Many of the ridges and mountains are fairly flat on the summit with large open parks. A small area of alpine meadow is found on Greenhorn Mountain. Precipitation falls in the form of winter snows and spring and summer rains with the possibility of higher elevations receiving over 20 inches of moisture while the lower elevations may receive less than 6 inches annually.

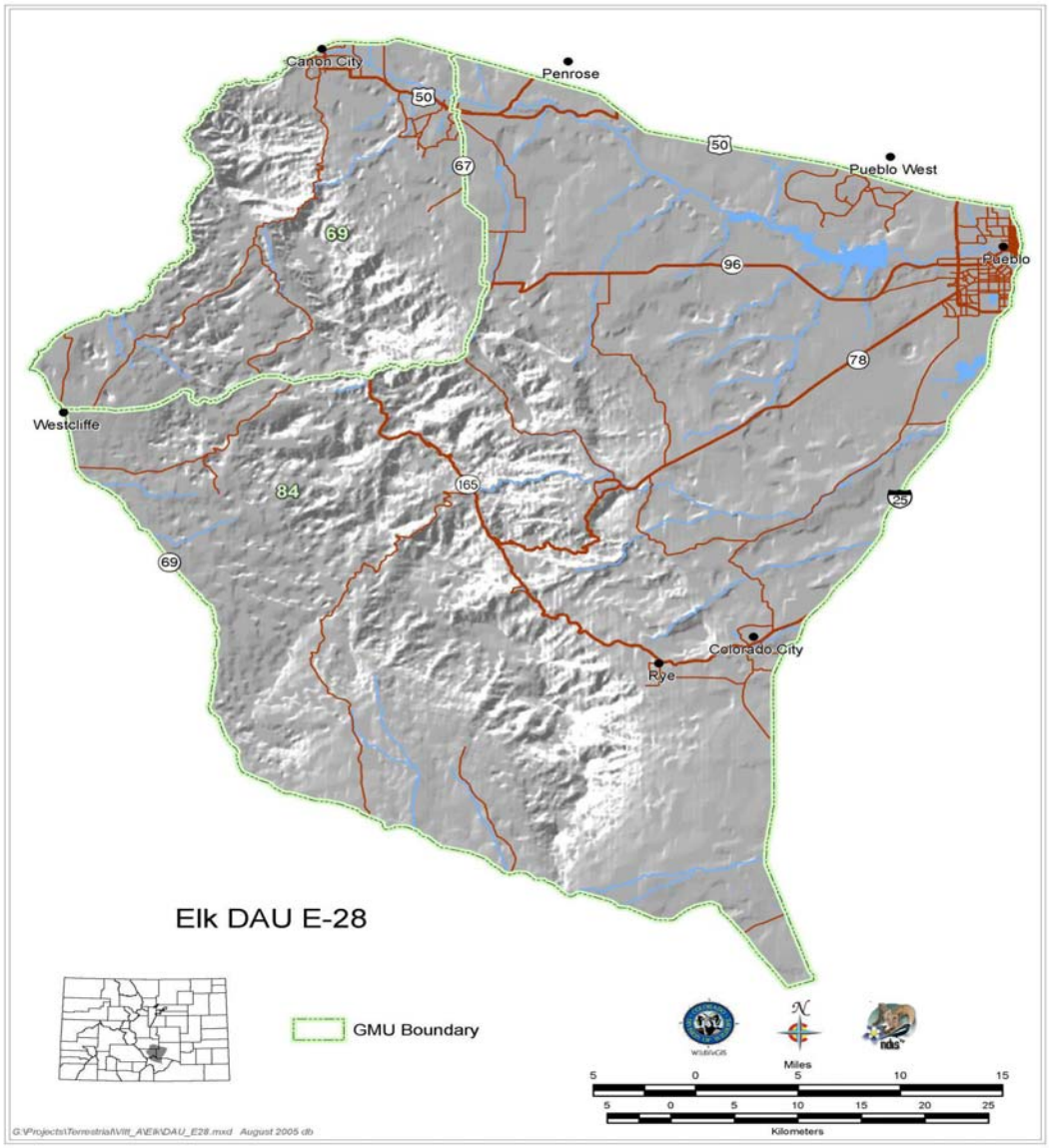

Figure 5. Elk DAU E-28

Major rivers in E-28 include: Arkansas River, Grape Creek, Oak Creek, Newlin Creek and Hardscrabble Creek in Fremont County; Grape Creek, Hardscrabble Creek, Antelope Creek, Froze Creek, St. Charles River, Beaver Creek and Ophir Creek in Custer County; Williams Creek, Turkey Creek and Apache Creek in Huerfano County; and the Little Graneros Creek, Greenhorn Creek, Cold Spring Creek, Muddy Creek, St. Charles River, Arkansas River and Red Creek in Pueblo County.

Of the 1,831 square miles in E-28 the Division of Wildlife controls 13 square miles (1%), U. S. Forest Service 451 square miles (25%), Bureau of Land Management 171 square miles (9%), State Land Board 72 square miles (4%) and 1,124 square miles are in private ownership (61%) (Figure 6).

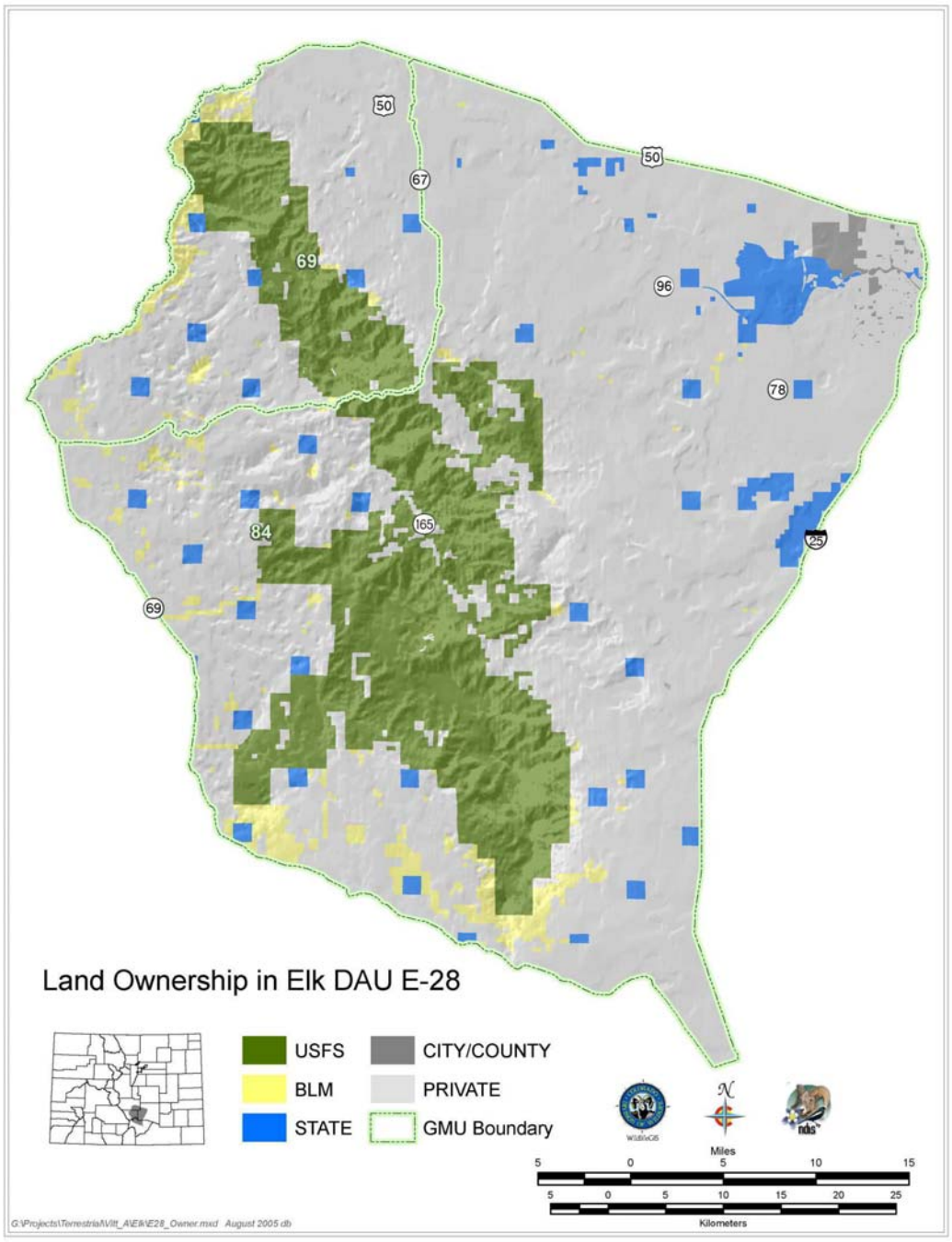

Figure 6. Land Ownership in Elk DAU E-28

Approximately 70% (1,282 square miles) of E-28 may be classified as elk habitat, of which 622 square miles (56%) is open to the public for hunting. The Division of Wildlife currently possesses the recreational lease on 6,400 acres (10 square miles) of State Land Board property in this DAU. These leased properties include: Bear Gulch (640 acres) and Lapin Creek (640 acres) in Custer County; Black Mountain (640 acres), Wolf Springs (640 acres) and Blue Springs (640 acres) in Huerfano County; and Florence (640 acres), Grape Creek (640 acres), Newlin Creek (640 acres), and West Bear Gulch (640 acres in Fremont County. Predominate biotic communities are: sub-alpine conifer, montane conifer, montane shrub and plains grassland. Elk may be found in all of these communities but are most common in the sub-alpine conifer, montane conifer and montane shrub communities.

Agriculture is the most predominate land use in the Grape Creek DAU, with livestock grazing occurring on both public and private lands. There are several alternative livestock operations in the area breeding elk and bison. Irrigated hay and alfalfa occur along many river courses while the majority of row crops are confined to small farms. Truck farms, nurseries and orchards are in operation near Penrose. Several correctional facilities have been constructed in the Canon City/ Florence area in the past 15 years.

There has been significant housing development in the past ten years, most apparent in Copper Gulch, Oak Creek, Indian Hills, Rosita, Querida, Florence, Beula, Pueblo West, Colorado City and Rye. These developments have decreased the quality and quantity of elk habitat in E-28, and continue to be a significant factor in habitat, social interaction and public tolerance of elk populations.

POPULATION DYNAMICS

Elk Distribution

Elk generally occupy the DAU from the grassland/shrub and Montane Conifer winter range adjacent to foothill areas to the higher mountain mixed conifer and sub-alpine regions in the summer. The overall range of the elk in the DAU is 1,282 square miles or approximately 70% 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 to January. The movement is generally to lower elevations and could be in all directions because of the configuration of the mountain ranges within which the elk summer. Wintering concentrations of elk are usually found in the foothills adjacent to the higher elevations which consist of heavy timber and little forage. Open wind swept hillsides of grass on south facing slopes along the Promontory Divide and Deer Peak area find most concentrations of elk in unit 84, while the grassland/shrub and ponderosa pine forests of GMU 69 contain most wintering elk in that unit. Migrating elk from E-27 (Sangre de Cristo DAU) will often cross the GMU boundaries at the southwest end of GMU 84 and spend considerable time in the Black Mountain/Promontory Divide area. Wintering elk in the Black Mountain area have caused considerable consternation during aerial surveys as to whether the elk belong in the Sangre de Cristo DAU or the Grape Creek DAU. Springtime estimates of elk

migrating back west have indicated that elk moving into GMU 84 during winter return to GMU 861 in the spring. No winter concentration areas have been identified in this DAU although severe winter range has been identified and mapped (Figure 7). Migration back to summer range usually follows the snow line with the elk dispersing into the overall range of the DAU in the summer and fall.

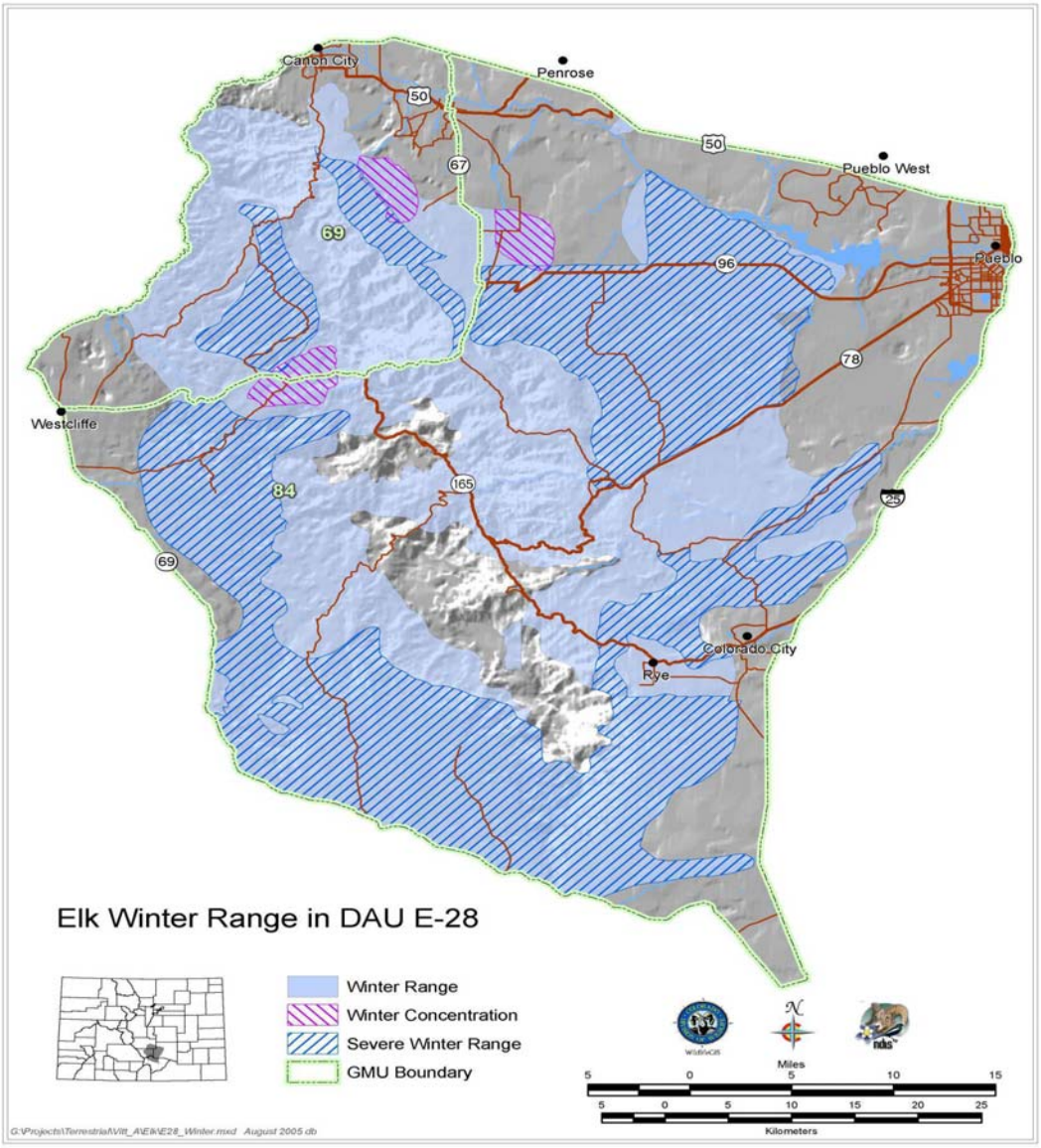

Figure 7. Elk Winter Range in DAU E-28

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 consistent with the herds' maximum sustained yield (MSY). 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 Grape Creek DAU consisted of GMU 69 east of Grape Creek and GMU 84. In 1989 GMU was split along Grape Creek and the resulting areas were given the designations of GMU 69, which contained the area east of Grape Creek, and GMU 691, which contained the area west of Grape Creek. The surface area of the DAU has not changed, only the GMU designations making data collection and limited license allocation more refined and accurate.

The DAU has been limited for elk as far back as our records go, except for in 1982, when bull licenses were unlimited on an experimental basis. There has been some level of antlerless harvest since the 1960's. The number of licenses available varied from 100 antlerless and 200 antlered in the 1970's to 300 antlerless and 200 antlered at present. An additional 200 Private Land Only antlerless licenses have been available since the 1999 hunting season. The addition of a Ranching for Wildlife Program in 1989 also added an additional 36 antlered and 38 antlerless licenses to the DAU. Archery licenses have remained fairly steady over the years from 137 either-sex licenses available in 1987 to 175 at the present time. Limited muzzleloader licenses have remained steady at about 80 licenses available per year.

Post-hunt population size is defined by spreadsheet population modeling using the DEAMAN program provided by Dr. Gary White at Colorado State University. DEAMAN uses population and herd composition data acquired during post-hunt aerial surveys as parameters to model population changes, these parameters may change as new information becomes available. Elk numbers in the Grape Creek DAU increased from about 1,400 in 1980 to an estimated high of about 2,400 in 1990 and 1993. The herd decreased to about 1,500 after the 1999 hunting season. The population has been over the herd objective of 1,500 since 1984 though recent increases in the number of antlerless licenses have increased harvest to reduce the population to the current population objective.

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 available 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 calves to cows. 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 subdivided into yearling bulls and mature bulls. It is generally accepted that observed bull/cow ratios are lower than in the real population, but that 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 50 calves per 100 cows, with a high of 58 in 1987 to a low of 45 in 1992. The observed bull/cow ratio from 1994 to 2004 averaged 17 bulls per 100 cows, from a low of 9 in 1995, to a high of 27 in 2004. The current long-term bull/cow ratio is 40 bulls per 100 cows. Again, it is generally accepted that observed bull/cow ratios are lower than in 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 is currently no statistically sound method 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. If 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 reserves the right to use this new information and the new techniques as they become available. Making these changes may result in significant changes in 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, harvest is higher because the surplus animals along with annual recruitment must be taken to reach population objectives. When the herd is at the population objective only the annual recruitment may be taken. Elk harvests have changed dramatically over time in this DAU, with about five times as many elk being killed in 1997 than in 1980. The harvest history generally reflects the increasing elk population, with the highest harvest corresponding to the highest populations. Also, higher harvests have occurred in recent years when the CDOW has been attempting to slow the population growth in an effort to achieve the population objective. Harvest from 1980 to 2004 ranged from a low of 85 elk in 1980 and 1984, to a high of 393 elk in 1997. Since 1985 bull harvest has averaged 104, with a low of 49 in 1987 and a high of 157 in 1996. With antlered harvest being managed through limited licenses there has not been a need for antler-point restrictions like many areas of the state. Harvest numbers depicted in Figure 8 are for all manners of take.

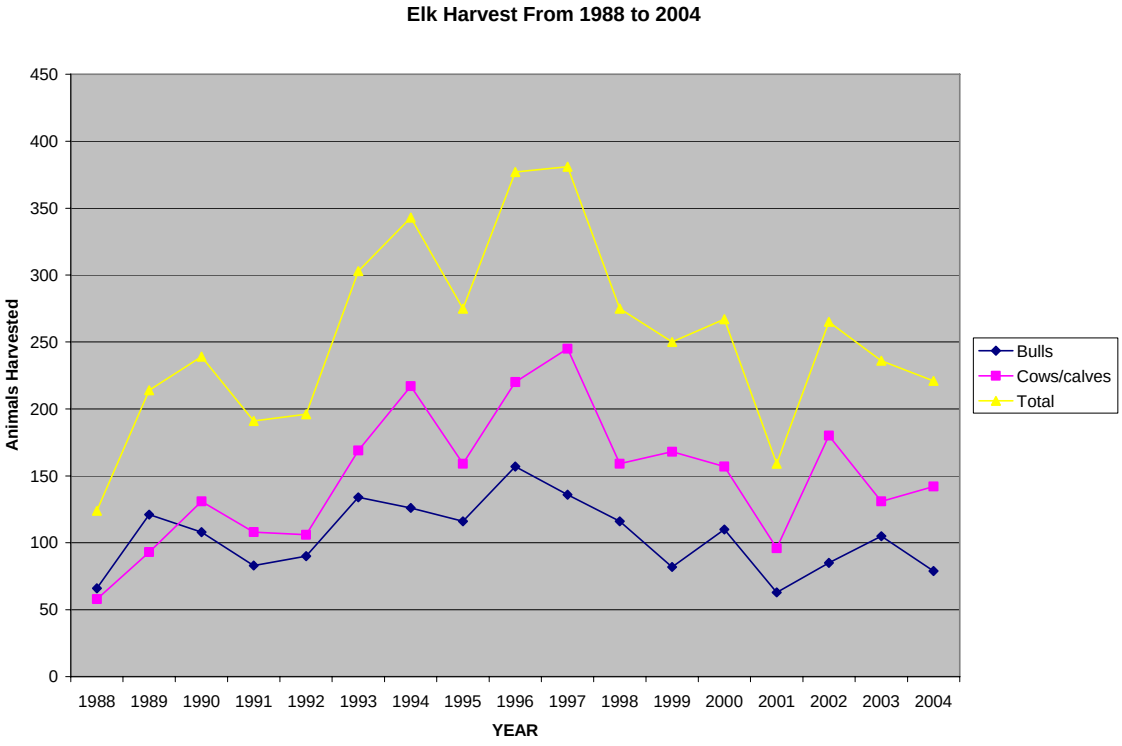

Figure 8. Elk Harvest in E-28 from 1988-2004

Annual success rates have varied from a low of 19% in 1987 to a high of 34% in 1989 and averaged 26%. The Hunter Success rates depicted in Figure 9 are over-all success rates for all seasons and all manners of take.

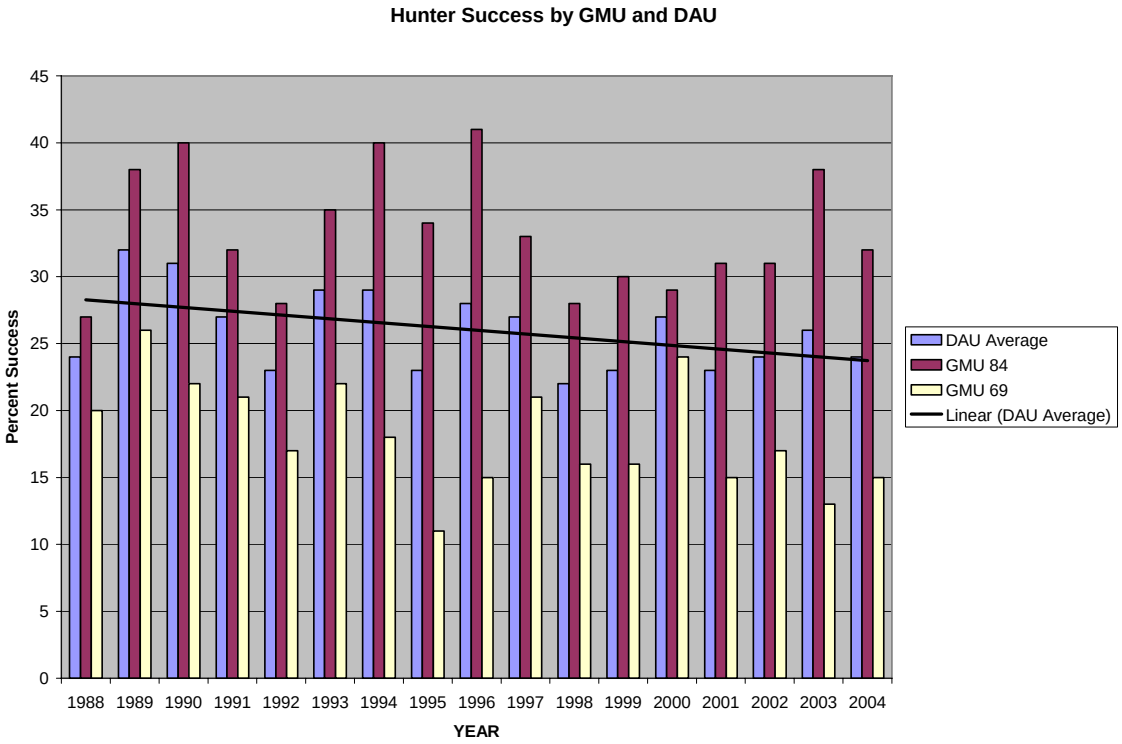

Figure 9. Hunter Success By GMU and DAU

Hunting Pressure

The number of hunters per year for all seasons between 1980 and 1999 ranged from a low of 341 in 1984 to a high of 1,772 in 1982. It should be noted that in 1982 antlered licenses in the Grape Creek DAU were unlimited on an experimental basis, thus resulting in the high numbers of hunters. The highest number of hunters in a given year since 1982 was 1,550 hunters in 1997. The increase in the hunter pressure from the mid to late 1990's is a result of the additional antlerless licenses in an attempt to reduce the population towards objective. Hunter numbers depicted by Figure 10 include all methods of take.

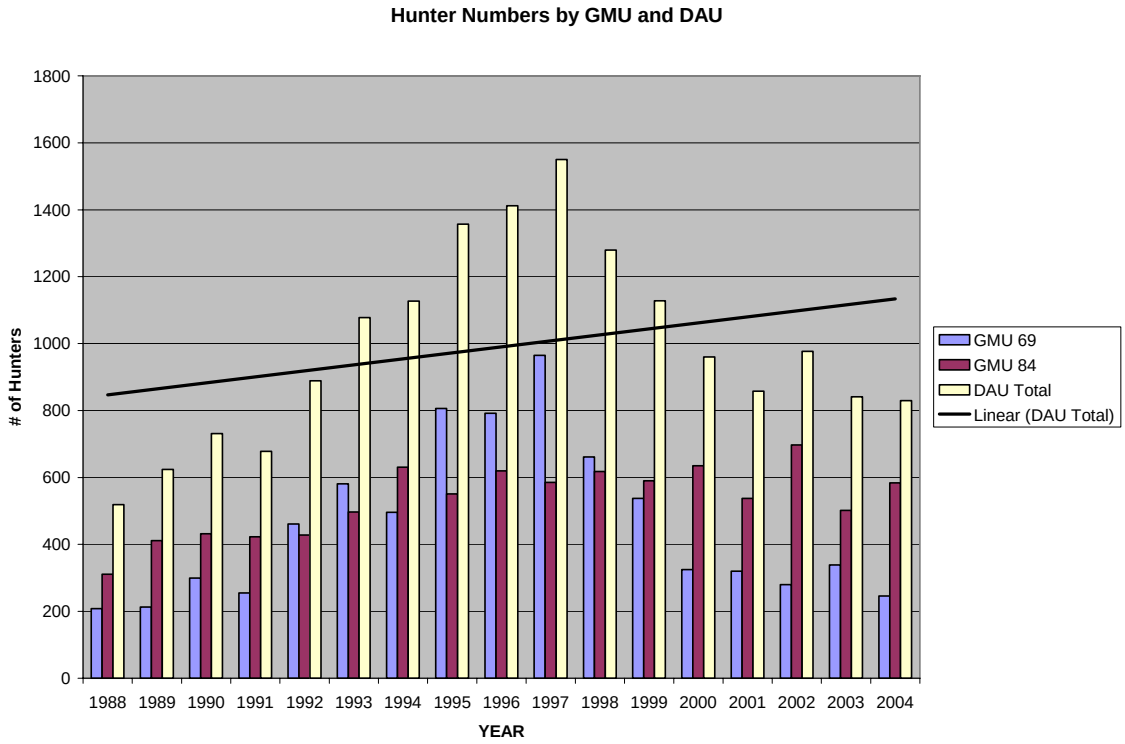

Figure 10. Hunter Numbers by GMU and DAU Total

CURRENT HERD MANAGEMENT STATUS

The 1998 post-hunt population estimate for the Grape Creek DAU was approximately 1,561 elk. This is only slightly above the current long-term population objective of 1,500 elk. The current herd model shows that after a population high of 2,666 in 1993 the herd has been reduced and with projected harvest should maintain population levels at the long-term objective.

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 higher level of harvest than the earlier models predicted. It is important to remember that herd modeling is an ever evolving science and with new information can change rapidly. The harvest has increased from an average of about 7% of the total population from 1983 to 1993 up to 15% in 1998.

The current long-term post-hunt sex ratio objective is 40 bulls per 100 cows. In 1998 the highest sex ratio of 27 bulls per 100 cows was observed. Using harvest data, observed data and survival rates, the current model estimates a post-hunt ratio of 33 bulls per 100 cows. Sustained bull harvest during the 1990's has shown that observed sex ratios during winter aerial surveys are lower than the real population exhibits.

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 to gather recommendations on the goals and objectives of the DAU plan.

In 1999 the CDOW held two public meetings in order to obtain issues and concerns. Public meetings were held in Westcliffe and Colorado City. There were 44 attendees in Westcliffe and 7 in Colorado City. Information presented included past management in E-28, the objectives of the DAU plan and several population and sex ratio alternatives for consideration. 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 at a later date. 13 people attended the meeting in Westcliffe resulting in comments from 9 people. Eight 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-28, 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 – This DAU has in the last decade seen a rapid development of housing in areas that once were part of elk ranges. Ranches have been subdivided 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. This development has combined to reduce the amount of useable winter range. The projected population of this elk DAU remained at nearly 2,400 elk from 1987 to 1995. That population exceeded the long-term objective of 1,500 elk and has since been reduced. It is felt that a population of 1,600 elk could be sustained long-term, a population that is 800 head fewer than estimated through the late 1980's and into the mid-1990's. Habitat improvement projects may be necessary to off-set the habitat loss due to development.

2. Maintaining high bull/cow ratios – The management of quality trophy opportunities on public and private lands is very important to a large segment of the public in this DAU. CDOW's objective is to maintain E-28 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 the society, along with one that is in balance with its habitat is very difficult to achieve.

3. Hunter Crowding – There is significant support to maintain this DAU as a quality elk area with totally limited licenses for elk hunters. The number one reason given by the public when asked why this DAU should not be unlimited is due to the hunter crowding issue. While some individuals feel there are too many hunters in the DAU already, most feel hunter crowding is not an issue at this time and want to maintain the quality of the hunting experience by not significantly increasing the number of hunters. There are concerns that access across or onto private property limits opportunity and concentrates hunters.

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. While bulls/cow ratios can be manipulated with different management practices, calf/cow ratios are determined by many different environmental factors, over which managers have no control. 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. Conversely, as the population objective increases, the larger the investment needs to be. Habitat management practices vary in labor intensity, costs and the life expectancy of the project. Individual practices that should be considered include prescribed firs, fertilization, seeding, water development, fencing, timber 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 would increase with increasing population levels.

Higher populations will also support higher hunter harvest, increase hunter opportunity, and increase the fiscal benefits to the economy. 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 alternatives.

Population Objective

1. **Maintain population at 1,500-1,700 (Current population level)**

   General Discussion – CDOW's current model indicates the population of 1,500 was achieved in 1998. Advances in population modeling programs and research indicate adult survival rates are higher than previously predicted by outdated modeling programs. For the purposes of developing population alternatives a population estimate of 1,800 elk will be used.
   Game Damage – Game Damage problems would be similar to current levels under this alternative. Fence and crop damage would be a concern to landowners.

Habitat Improvement – Habitat improvement projects would be needed for distribution problems as they arise and as a result of lost habitat due to development, etc.
Season Framework - The season framework approved for the 2005 hunting season could be maintained. The current harvest strategy will continue through the 2005 season, and then the antlerless harvest would be reduced to levels necessary to maintain the population objective.
Fiscal Impacts – License sales would be reduced from 2004 levels in order to maintain the population at objective.

2. Increase the population objective to 2, 150-2,250(25% increase)

General Discussion –Elk numbers increased through the late 1980's and early 1990's to nearly 2,500 elk. The increase was accepted by hunters but landowners' complaints of agricultural damage persisted. Herd reductions in the 1990's have been more acceptable. The population increase 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 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 would 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 may 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 1,250-1,350 (25% decrease)

General Discussion – This alternative would represent the elk population found in E-28 in about 1979. Sixty-one 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 may 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 may reduce damage complaints.

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 current bull/cow ratio is a result of limited antlered licenses causing a decrease in the antlered harvest over several years. This has increased the opportunity for more bull elk to survive several hunting seasons without the common restrictions on antler points. The average number of observed bulls per 100 cows since 1985 is 14, while the population model has projected the average since 1985 at 36 bulls per 100 cows. The current long-term objective is 40 bulls per 100 cows.

1. **Maintain current post-hunt sex ratio objective of 35-40 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 complaints. Since a population objective has been established, the total number of elk remains the same.
Season Framework – The season framework could be maintained in its present format.
Survival rates, quality and quantity 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 40-45 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 complaints. Since a population objective has been established, the total number of elk remains the same.
Season Framework – The season framework could be maintained in its present format. Due to various factors the bull/cow ratio has stabilized at about 35 bulls per 100 cows. To increase from 35-40 to 40-45 bulls/100 cows would require a reduction in the bull harvest which would require a reduction in the number of antlered licenses.
Survivial Rates, Quality and Quantity of Harvest – The bull harvest would need to be reduced to achieve this goal. The quality of harvest would not likely change ,

as it is not likely that we would see a major change in the age structure of the bulls by only increasing from 40 to 45 bulls/100 cows. It is possible that more immature bulls will emigrate from this population to avoid competition with mature bulls.

Fiscal Impact – The number of hunters would be reduced and license sales would decline.

3. Decrease the Post-hunt Sex Ratio to 25-30 bulls/100 cows.

Habitat Improvement and Game Damage – Habitat improvement projects may be necessary to increase the carrying capacity of the summer range. This alternative would produce the maximum number of elk available for the harvest each year, since pre-hunt populations would be higher under this management strategy. It should not impact damage claims because post-hunt populations should remain at or near objective.

Season Framework – This alternative would require a change in seasons and the license allocation process, or antlered licenses would need to be increased substantially. The DAU would no longer be considered a quality elk hunting unit. This would require the CDOW to direct the hunting pressure to the male segment of the population by increasing antlered license numbers.

Survival Rates, Quantity and Quality of Harvest – This alternative would produce the largest pre-hunt population because more cows would be necessary to maintain the herd at the population objective. Carrying more cows in the herd would increase the number of calves produced each year. This then would increase the overall harvest potential of the herd. Survival rates may not change, but the total number of elk lost to winter mortality may increase because more calves are being carried into the winter and their mortality is somewhat higher than adults during this time. The quality of harvest would likely decrease in response to hunting pressure placed on the males. It would be more difficult for the bulls to survive successive hunting seasons so that they might reach the older age classes.

Fiscal Impacts – This alternative would increase hunter success, total harvest and recreation days. It would produce the maximum harvest potential of the herd.

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. Nine hundred twenty-eight questionnaires were distributed within the appropriate GMUs. One hundred fifty-five 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.

ELK

Grape Creek Data Analysis Unit

X People are very interested in seeing elk in Units 69 and 84 (79%) and in hunting elk (62%). More than half of respondents (58%) indicated they were "very interested" in learning more about elk management and (56%) 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 (63%), winter starvation (43%), and predators (30%).

X Seventy-two percent of respondents enjoy the presence of elk and do not worry about problems elk may cause, whereas 21% enjoy elk but worry about potential elk-caused problems.

X The majority of respondents wanted a "slight" (23%), or "moderate" (37%) increase in the elk population; 6% wanted a decrease; and 10% wanted "no change". The average rating indicated a "moderate" increase. In this survey, a moderate increase was rated as a 26-50% increase.

X Fifty-seven percent of respondents wanted to see a "slight" (23%), or "moderate" (34%) increase in the number of bull elk in Units 69 and 84; 10% wanted "no change".

X Thirty-one percent of respondents rated the overall success of CDOW's elk management in GMU's 69 and 84 as "poor" to "fair" and 52% felt we were doing a "good" to "excellent" job.

X Ninety-one percent of respondents hunted elk in Colorado with an average of 16 years. Of those, 57% have hunted elk in GMU's 69 and 84 for an average of 8 years.

X The level of satisfaction with past hunting experiences in GMU's 69 and 84 was rated as 34% dissatisfied, as compared to 50% satisfied. Sixteen percent of respondents remained neutral.

X Crowding is somewhat of an issue. Forty-eight percent have felt "extremely" (12%) or "moderately" (36%) crowded, while 52% felt "slightly" (34%) to "not at all" (18%) crowded.

X The quality of elk hunting opportunities in GMU's 69 and 84 was rated as "fair" by 27% of respondents, "good" by 26%, "very good" by 15%, "excellent" by 12%, and 6% had no opinion. The average rating was 3.0, which equaled a "good" score.

X The most important factor when hunting elk in Units 69 and 84 was for "obtaining meat", as selected by 66% of respondents. Sixteen percent selected "get a trophy", and 18% chose "few contacts with other hunters". Note: since this is a limited licenses unit managed for quality elk, and not open to over-the-counter bull licenses, there is a disproportionate number of cow licenses. The high number of cow licenses tends to weight the answers in favor of obtaining meat.

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. 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.

5. 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.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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.

ELK

Grape Creek Data Analysis Unit

X People are very interested in seeing elk in Units 69 and 84 (63%) and in hunting elk (56%). More than half of respondents (56%) indicated they were "very interested" in learning more about elk management and (63%) 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 (87%), winter starvation (63%), and the revenue that elk hunting and viewing provides for local businesses (50%).

X Sixty-nine percent of respondents enjoy the presence of elk and do not worry about problems elk may cause, whereas 31% enjoy elk but worry about potential elk-caused problems.

X The majority of respondents wanted "no change" (38%), or "slight" increase (31%) in the elk population; 6% wanted a "slight" decrease; and 13% wanted a "moderate" increase. The average rating indicated a "slight" increase. In this survey, a slight increase was rated as a 1-25% increase.

X Sixty-three percent of respondents wanted to see "no change" in the number of bull elk in Units 69 and 84, with 19% wanting a "slight "increase or a "moderate" (19%) increase.

X Sixty-nine percent of respondents rated the overall success of CDOW's elk management in GMU's 69 and 84 as "good" (38%) to "very good" (31%) and 6% felt we were doing an "excellent" job.

X Sixty-nine percent of respondents hunted elk in Colorado with an average of 16 years. Of those, 27% (3) have hunted elk in GMU's 69 and 84 for an average of 15.6 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 Sixty-six percent of respondents felt "slightly" crowed while the other 33% felt "not at

all" crowded.

X Two respondents listed the quality of elk hunting opportunities in GMU's 69 and 84 as "good", while the third rated the quality as "very good".

X The most important factor when hunting elk in Units 69 and 84 was to "get a trophy", as selected by two of the respondents. The other person chose "few contacts with other hunters".

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 what 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 rates 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: 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:
http://wildlife.state.co.us/news/index.asp?DivisionID=3

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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