DAU E-19 (Glade Park)
EXECUTIVE SUMMARY
MAY 2010

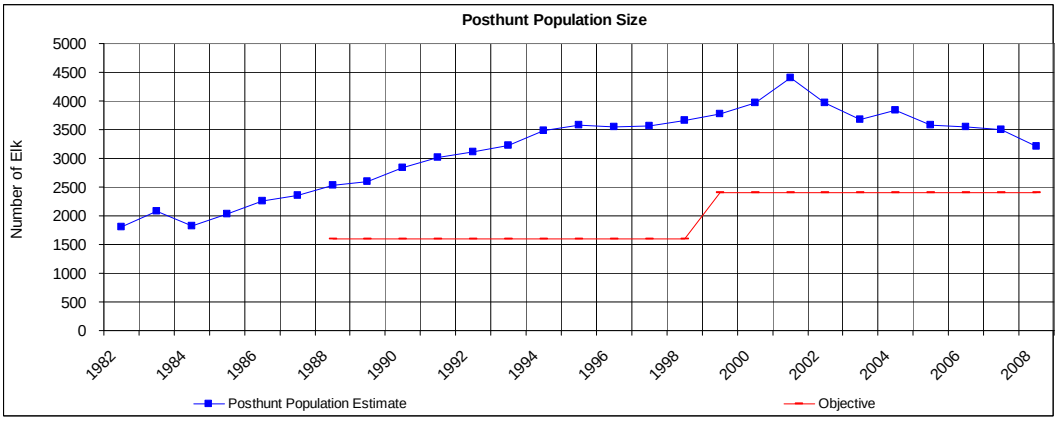
GMU: 40 Land Ownership: 38% Private, 56% BLM, 2% USFS, 4% Federal

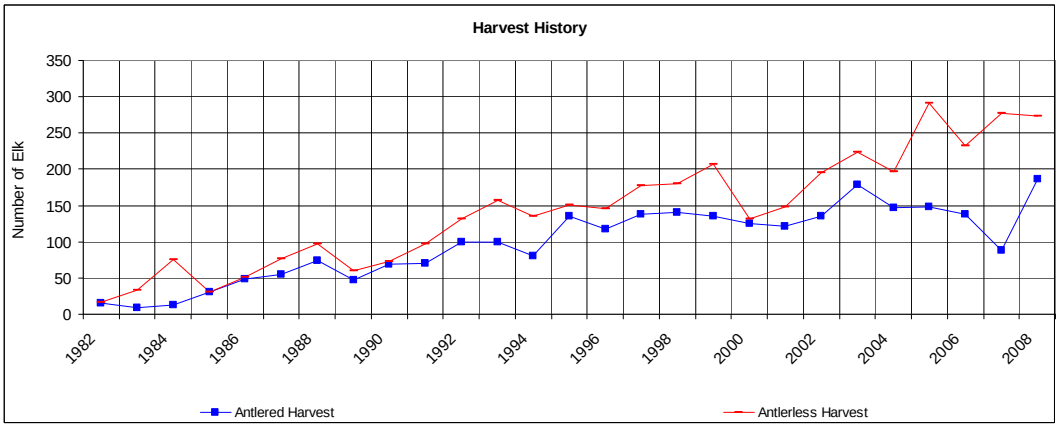
Post-hunt Population Objective: 2,400 **2008 Estimate:** 3,200

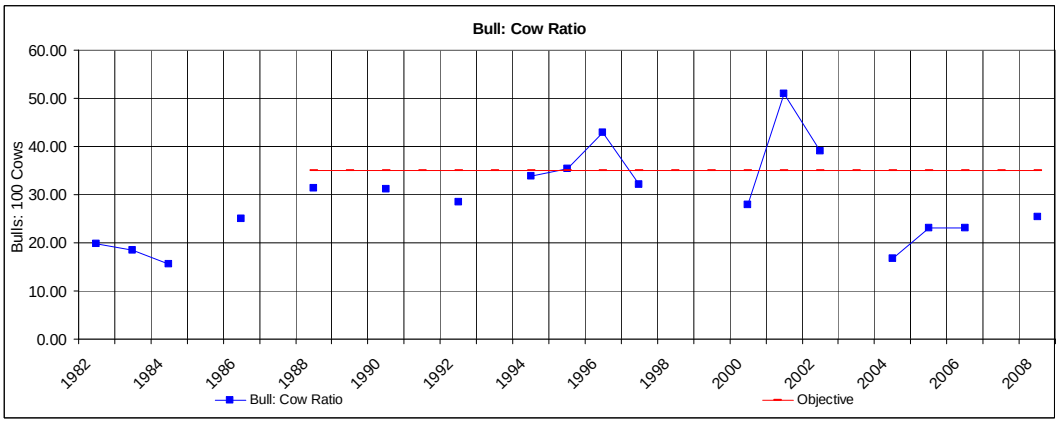
Recommended: 2,800 – 3,800

Post-hunt Composition (Bulls/100 Cows): Objective 35 **2008: Observed:** 25.4 **2008 Modeled:** 26.9

Recommended: 30 – 35







E-19 BACKGROUND

The Glade Park E-19 DAU is located in west-central Colorado and includes both Glade Park and Pinon Mesa, southwest of Grand Junction, Colorado. Since 1999, the population objective for the Glade Park elk herd has been 2,400 animals. The current composition objective for elk is 35 bulls: 100 cows.

The elk population in E-19 was at similar levels to current populations during the early 1990's. There was dramatic growth of this herd during the mid-1990's through the early 2000's, with the population increasing to approximately 4,400 animals in 2001. This large increase in population size resulted in public demand to increases in harvest, reducing the herd to the present estimate of 3,200 animals.

The CDOW has conducted aerial sex and age composition surveys in E-19 since the late 1970's. Early records in the 1980's show that total bull: cow ratios were below 5 bulls: 100 cows. These ratios have increased to an average of 23.8 bulls: 100 cows in 2005 – 2008, with a high of 50.9 bulls: 100 cows in 2001. This increase in bull: cow ratios is due in large part to strict limits on antlered licenses in the DAU. Accurate and unbiased bull observations during annual classification flights are challenging due to migration of bulls to Utah during winter months. The quality of harvested bulls and overall hunter satisfaction indicates that bull: cow ratios are likely higher than observed values.

In 1982 the age ratio was 71.1 calves: 100 cows, the highest ever observed in this DAU. Since that time, it has generally stayed between 50 and 60 calves: 100 cows. Between 1982 and 1992, observations averaged 59.2 calves: 100 cows. The average between 2000 and 2008 was 52.8 calves: 100 cows. It is possible that declining habitat quality has created a density - dependent situation, leading to lower calf: cow ratios.

The harvest history generally mimics the increasing elk population. The highest harvests have occurred in conjunction with the highest populations and when the CDOW has been aggressively trying to reduce the elk population in an effort to achieve the DAU population objective. In 1982, only 15 bulls and 16 cows were harvested. In 2008, 273 cows and 187 bulls were harvested. As the population reaches the objective and stabilizes, it is likely that harvest will also decrease.

SIGNIFICANT ISSUES:

The most important aspect of the DAU planning process is obtaining input from all segments of the affected local populations, including County Commissioners, US Forest Service and Bureau of Land Management, and interested stakeholders.

Meetings were held to solicit input from the USFS, BLM, the local public, and the Mesa County Board of County Commissioners. A questionnaire was available at these public meetings and on the DOW web site to solicit opinions from the public.

Several significant issues were identified during the DAU planning process. The primary issues involved maintaining quality antlered harvest, access to huntable lands, deer and elk competition, and license availability.

There is significant concern over the Ranching for Wildlife program and the landowner voucher program. Although neither issue is within the scope of this plan, the substantial interest in these two issues merits reference.

Generally, most stakeholders indicated that elk population size and composition are at acceptable levels, although there is some demand to decrease the population size. There is significant demand to maintain the availability of older age class bulls and trophy quality harvest. The majority of respondents were satisfied with current population size and the general consensus was to maintain the status quo.

E-19 MANAGEMENT ALTERNATIVES

Three post-hunt population objective alternatives were proposed for E-19 (1) 2,400 – 3,300; (2) 3,300 – 4,200; or (3) 4,200 – 5,000. This population has been over objective since the early 1990's, but is declining as a result of increasingly high harvests in recent years. It is recommended that the population be maintained at current levels, with an objective range of 2,800 – 3,800 elk.

Three post-hunt composition objectives were proposed for E-19 (1) 20 – 25 bulls: 100 cows, (2) 25 – 30 bulls: 100 cows, or (3) 35 – 40 bulls: 100 cows. Alternative 1 would decrease the number of bulls in the herd, thereby increasing antlered license numbers available, alternative 2 would maintain the number of bulls in the herd and antlered licenses available, and alternative 3 would increase the number of bulls in the herd and result in a dramatic decrease in antlered licenses available each year. It is recommended that the bull: cow ratio be maintained at current levels, with an objective range of 30 – 35 bulls: 100 cows.

GLADE PARK
DAU E-19
HERD MANAGEMENT PLAN

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INTRODUCTION AND PURPOSE

The Colorado Division of Wildlife (CDOW) manages wildlife for the use, benefit, and enjoyment of the people of the state within the guidelines set forth in the CDOW's Strategic Plan, Five Year Season Structures, and mandates from the Wildlife Commission and Colorado legislature. Colorado's wildlife resources require careful and increasingly intensive management to accommodate the many and varied public demands, as well as increasing impacts from a steadily growing human population. The primary tool that the CDOW uses to manage game wildlife within the state is annual hunting seasons. Historically, big game season have been set as a result of tradition or political pressures. Often, the seasons that resulted did not adequately address big game population dynamics or current habitat conditions and pressures.

More recently, big game herds within the state are managed at the herd level, called a Data Analysis Unit (DAU). DAU boundaries are drawn so that they approximate an area where most of the animals are born, raised, and die with as little ingress or egress from other herds as possible. Normally, each DAU is composed of several game management units (GMUs). Within these DAUs, the herd is managed using the guiding principles set forth in the comprehensive DAU plan.

These DAU plans are updated at ten year intervals through a public planning process that incorporates big game management principles and the many and varied public interests associated with Colorado's wildlife, as well as the mandates of the Wildlife Commission and state legislature. As many interested parties as possible are involved in the planning process, including the U.S. Forest Service, Bureau of Land Management, sportsmen, guides and outfitters, farmers, ranchers, the business community, outdoor recreationists, anglers, and the wildlife viewing public. All these groups have a vital interest in the size and composition of the state's big game herds.

The DAU plan establishes two primary management objectives: the approximate post-hunt population size objective, and the post-hunt composition (number of bulls: 100 cows) objective. These two objectives determine the overall size and structure of the population and influence the management strategies used to reach the goals. The DAU plan also collects and organizes most of the important management data for the herd into one document, determines relevant issues through a public scoping process, identifies alternative management strategies to resolve these issues, and selects the preferred management objective alternative.

Once these population and composition objectives are set through the DAU planning process, the CDOW works to achieve these goals annually. The population objective determines how many animals need to be harvested to maintain or achieve the population objective. To reach these objectives, the CDOW uses a method called "Management by Objectives" approach (Figure 1).

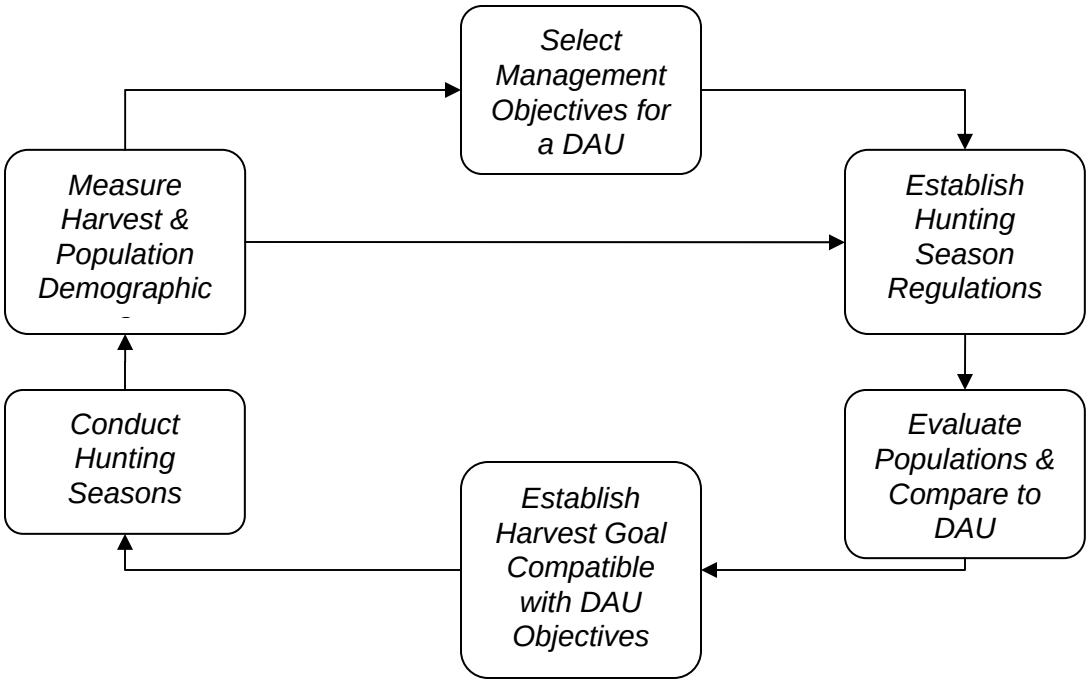


Figure 1. CDOW's Management by Objective Process

To collect and analyze harvest estimates and survival estimates, CDOW biologists use ongoing research projects, post-hunt aerial classification surveys and computer models. The data collected during annual aerial surveys are used in these computer models and allow biologists to estimate population size and structure. These estimates are then used to generate harvest recommendations that will align population estimates with the herd population objectives generated by the DAU planning process.

DESCRIPTION OF DATA ANALYSIS UNIT

Location

The Data Analysis Unit is located in the west central portion of Colorado and is commonly called the Glade Park DAU. Its CDOW designation is E-19. It is bounded on the north by the Colorado River; on the east by US Hwy. 50; on the south by Colo. Hwy. 141 and Dolores River; and on the west by the UT-CO state line (Figure 2).

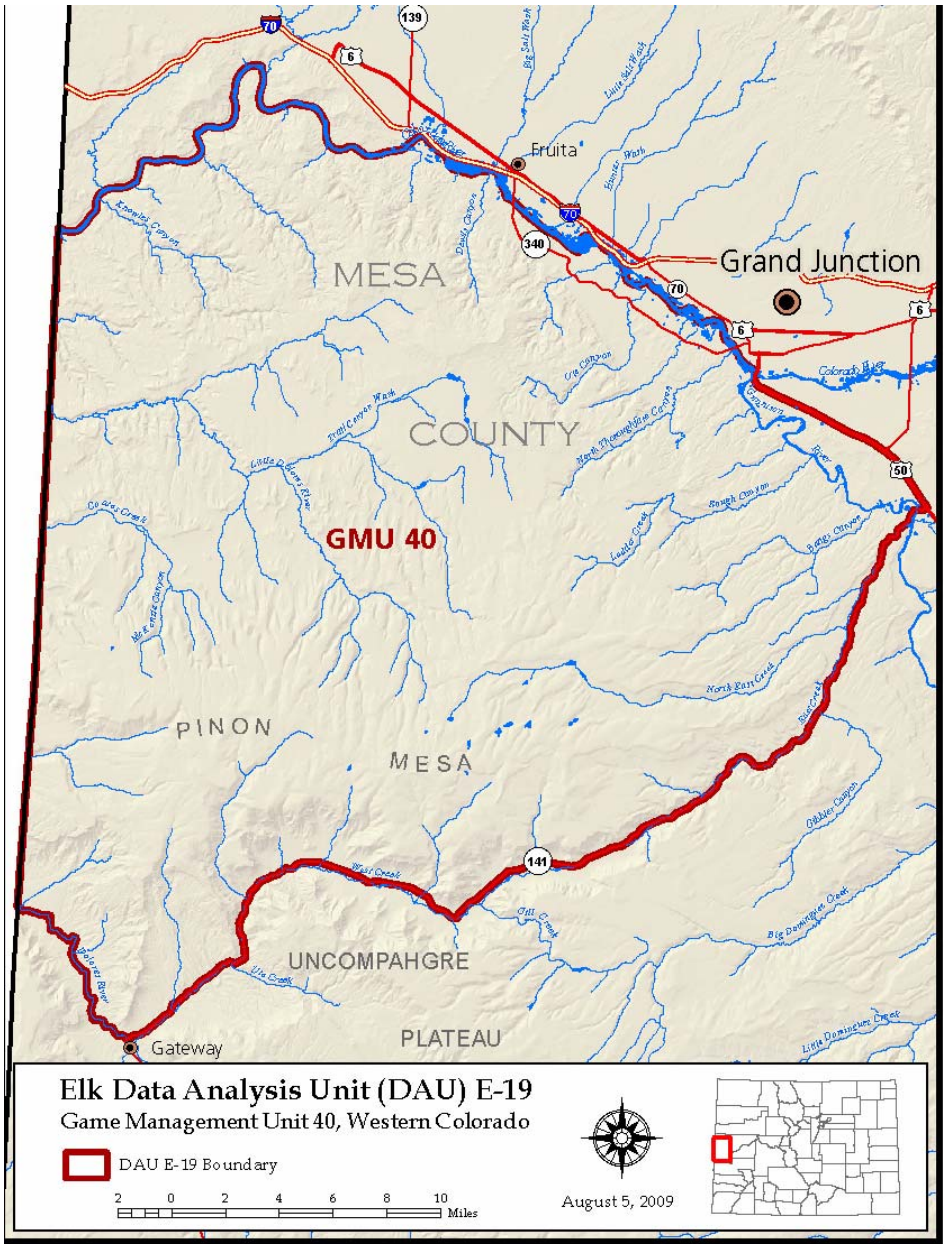


Figure 2. Location of DAU E-19 in west-central Colorado.

Physiography

This DAU can be broadly divided into two units: Glade Park, in the northern portion and Pinon Mesa rising south and west of Glade Park. The DAU is called both Pinon Mesa and Glade Park and the two are often used interchangeably. The topography varies greatly in the DAU. The highest elevations in the DAU are at its center and from there elevation decreases in all directions. The highest point is approximately 9,700 feet at the south-center of the DAU. The lowest point is where the Colorado River meets the UT state line at approximately 4,600 feet.

The Colorado River forms the northern boundary of the DAU. Interstate 70 parallels the Colorado River, forming a significant barrier which restricts elk movements throughout the northern portion of the DAU. Additionally, nearly vertical sandstone canyons on the north end of the unit prohibit much elk movement to the north.

Along the eastern boundary, the Gunnison River and the city of Grand Junction, as well as the desert-like, open terrain act as a natural barrier restricting elk movement. The Unaweep Canyon forms the eastern and southern boundary of the unit and is a well-known geologic feature. It is a broad, steep-sided canyon composed of both granite and sandstone formations. Two creeks, East Creek and West Creek, flow out of either end of the canyon.

The Dolores River forms the southern boundary of the unit for a short distance north of the town of Gateway and to the UT state line. The western boundary, the Colorado-Utah state line, is not marked by significant natural boundaries to elk movement.

Sandstone canyons are one of the dominant geologic features of this DAU. The terrain on the south side of the Colorado River from the Colorado National Monument (COLM) west to the state line is noted for its expansive sandstone canyon system. This area, including the COLM, Black Ridge Canyons Wilderness Area, and the McInnis Canyons National Conservation Area, has extensive canyon systems.

The Colorado, Gunnison, and Dolores Rivers surround the DAU. The Little Dolores River is one main drainage that originates in the DAU. The highest elevations in the unit receive significantly more precipitation than lower elevations, and perennial and intermittent streams are quite common. There are no large natural lakes in the unit. Small reservoirs have been constructed for livestock water, irrigation, and municipal use for the town of Fruita.

The wide range of the terrain in this DAU provides a variety of physical features that elk populations find very suitable for their year-round needs. Due to this variety of landscape features, large numbers of elk can be supported in this herd unit. Elk summer ranges are found in the center of the DAU. Elk are forced to migrate to lower elevations during the winter.

Annual precipitation ranges from about 8 inches in the desert country near Grand Junction to over double that amount in the highest elevations of the unit. Much of the annual precipitation is in the form of snow.

Vegetation

Vegetation in this DAU varies due to the wide range of elevations. Vegetative communities grade into each other in response to slope and aspect. Higher elevations, which receive considerably more moisture, are composed of aspen and spruce-fir forests. Ponderosa pine and oakbrush communities are found just below the aspen/spruce/fir zone. Pinon-juniper woodlands are found on the lower and intermediate slopes throughout the DAU. These pinon-juniper woodlands are usually found in the lower, drier areas. Sagebrush and snowberry are commonly found in open areas in the oakbrush zone at intermediate and higher elevations. Sagebrush is found throughout the DAU at lower elevations also. Desert shrubs types, including greasewood and sagebrush are found along drainages at the lower elevations.

Irrigated cropland and grassland with half-shrub mixtures and grass/alfalfa meadows are found in the valleys and on Glade Park. Irrigated crops include corn, grains such as wheat, barley, and oats, and alfalfa and grass grown for pasture and hay

River bottoms along the Colorado and Dolores Rivers are dominated by cottonwood trees and other species including willows, boxelder and alders. Tamarisk is also found along the river corridor, particularly at the lower elevations near Grand Junction and Gateway.

The vegetation in the unit has been extensively managed for livestock forage production. Cattle grazing occurs throughout the unit and domestic sheep were historically grazed in significant numbers. Although there is still significant cattle production, domestic sheep are found only in small flocks on ranchettes.

In addition to grazing, the vegetation has been heavily influenced by other human activities. Natural fire has been excluded and suppressed for many years. However, several significant fires in recent years have occurred in the unit. These fires have burned in predominantly pinon-juniper woodlands, improving overall winter range conditions, particularly for elk.

Land Ownership

The Glade Park E-19 DAU is 744 square miles in size and contains a mixture of public and private lands (Figure 3). Approximately 62% of the lands within this DAU are public property. Of the overall area, 4 % is managed by the United States Forest Service (USFS) and about 56 % by the Bureau of Land Management (BLM). The National Park Service owns 4%. The Grand Mesa

National Forest manages the 12 square miles of USFS lands found in the DAU. The BLM lands are managed by the Grand Junction Field Office. Privately owned lands make up 38 % of the total.

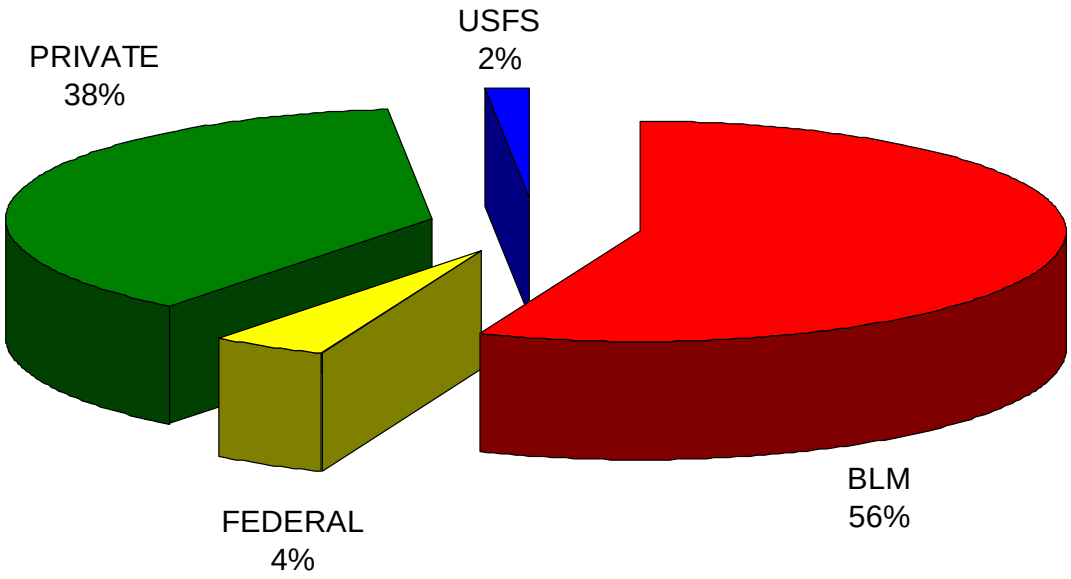


Figure 3. Land Ownership in DAU E-19.

The main population center in the DAU is found in the Grand Valley, in Grand Junction and Fruita.

The land ownership in this DAU is unique in Colorado. Unlike many areas in western Colorado, public lands in this DAU are generally found at lower rather than higher elevations. The most productive lands in this DAU are generally found at the intermediate and higher elevations. These higher elevations were homesteaded rather than the dryer, less productive lands at lower elevations.

Land Use

Because of the DAU's wide range in elevations, there are a variety of uses occurring on the lands. Livestock production and big game hunting are two of the most well-known activities in this DAU. Non-hunting recreation and tourism are also important aspects, particularly in the Colorado National Monument.

- **Agriculture:**

Much of the private land in the DAU is used to graze livestock throughout the year. Cattle ranchers graze livestock on USFS and BLM land during various seasons of the year. On USFS lands, livestock are grazed on allotments during

the summer and then during the fall ranchers move the livestock to home ranches for the winter.

Throughout the DAU on private lands other agricultural crops are grown, including corn, various small grains, and the production of hay for livestock.

- **Timber Harvest:**

There is limited timber harvest in this DAU. Some commercial timber is sold and harvested on private lands in the DAU. Spruce/fir timber is cut to provide wood for the construction industry. Aspen has also been harvested, often as part of other land management practices including benefits to wildlife, including deer and elk. Some firewood is harvested, both commercially and privately.

- **Residential Housing:**

The DAU has several population centers that primarily occur along the major river drainages. The Grand Valley, which borders this DAU to the west, has the largest population in the area surrounding the DAU. Grand Junction is the largest town and is surrounded by other growing populations (Table 1). Other population centers include Glade Park, Whitewater, and Gateway.

In addition to the major population centers, many large pieces of private lands in this DAU have been subdivided and sold for construction of residential single family housing. Many 35 acre and smaller parcels have been developed in recent years and this development continues to increase. Often these parcels are large enough o maintain horses and other livestock. Subdivisions of this nature have occurred in the Glade Park, Little Park, and Unaweep Canyon areas. The fragmentation of the landscape reduces habitat quality and quantity and is located in areas that were formerly deer and elk winter range.

COUNTY	TOWN	POPULATION
Mesa	Grand Junction	45,000
	Fruita	6,600
	Glade Park	500
	Gateway	60
	Whitewater	1,500
	Total County	120,000

Table 1. Human Population Estimates within DAU E-19.

- **Recreation:**

Recreation is probably one of the most visible and extensive uses occurring on all lands in this DAU. McInnis Canyon National Conservation Area, the Black Ridge Canyons Wilderness Area, the Colorado National Monument, Bureau of Land Management lands, and the Grand Mesa National Forest lands provide significant opportunities for varied types of recreation. Excellent backcountry hiking, biking, and off highway vehicle (OHV) trails provide numerous days of recreational activity for a large number of visitors. Fishing is limited to some of the larger perennial streams and to a small number of public and private reservoirs. Big game hunting for deer, elk, bear and desert bighorn sheep provides recreational opportunities during the fall.

- **Mining and Oil & Gas Development:**

At this time there is no oil & gas development occurring in this DAU and future activities seem unlikely. Other common mining resources, including uranium, are also relatively unpromising and not expected to be developed in the near future.

HISTORICAL HERD MANAGEMENT

Prologue

The total number of animals in a big game population fluctuates throughout the year. Normally, the population peaks in the spring just after 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 conclusion of the last hunting season) 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 taking into account many different variables to arrive at a final population objective number. Some prominent variables include biological data, political and economic considerations, recreational interests, domestic livestock concerns, and vegetative capabilities. Population objectives should be set at a level consistent with the herd's maximum sustained yield (MSY). However, it is very difficult to determine the MSY and carrying capacity for any given area and herd (see Appendix A for a brief summary of the concept of MSY and carrying capacity).

Post-hunt populations in this plan have been generated by the computer model referenced in the Introduction and Purpose. These population estimates are just that: estimates, and are used primarily to identify trends and issues of major concern. A brief discussion concerning population assessment is contained in a *Population Assessment Procedure Overview*.

Population Assessment Procedure Overview

Estimating populations of wild animals over large geographic areas is an extremely difficult and inexact science. 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 ratios data taken from helicopter surveys in December and hunter harvest information. The surveys provide baseline information which is used to align the models. Hunter harvest surveys are another factor. Other data requirements include winter survival for different age classes and sexes, wounding loss, and winter severity factors. As better information becomes available, such as new 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. 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.

Post-hunt Population Size

Elk are highly adaptable and hardy big game species. While populations were almost extirpated from Colorado near the turn of the century due to over-hunting, they have rebounded dramatically.

Elk populations on Glade Park were relatively low in the 1980's and have shown both steady and remarkable growth (Figure 4). The E-19 elk herd is currently a stable to decreasing population. Elk populations in E-19 steadily increased until 2001, mirroring the growth of elk populations throughout Colorado and the west. Since the early 2000's, however, the population has been declining. This decline has resulted from a concerted effort to reduce the population size and reach the population objectives in the DAU plan.

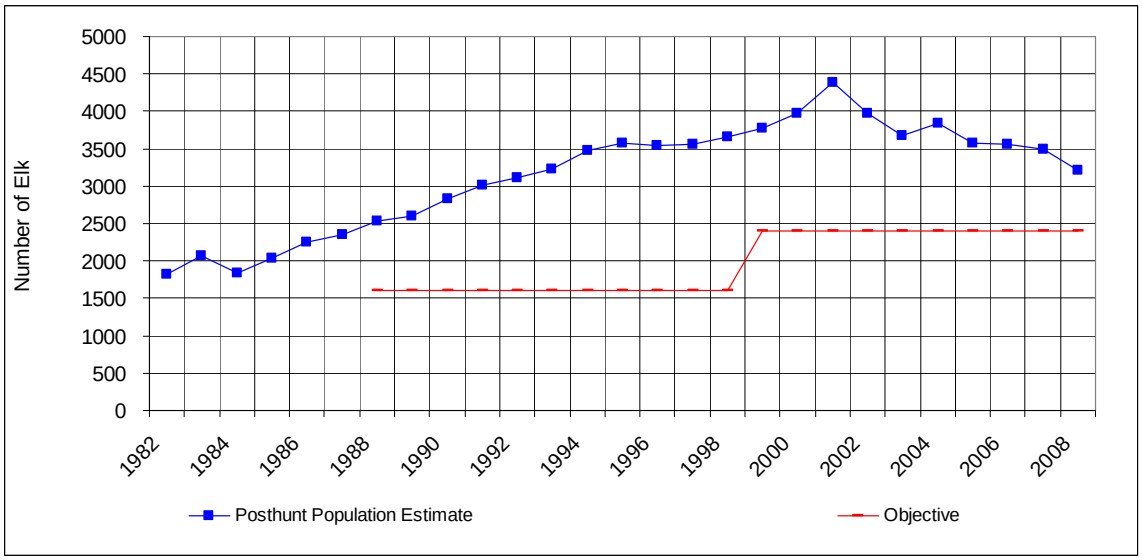


Figure 4. Posthunt Population Estimates for E-19.

Post-hunt Herd Composition

Since 1979, the CDOW has conducted aerial sex/age composition surveys in E-19. Prior to that time these classifications were conducted on a less scheduled time frame with data going back to 1974. These classifications are designed to sample 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. The data provides information on reproductive success, survival of calves, and information on the ages of the adult male segment of the population. Generally, E-19 surveys are flown every other year due to budgetary constraints.

- **Bull: Cow ratios**

Bull: cow ratios in E-19 were low in the early 1980's until antlered licenses were restricted to improve the overall antlered harvest quality in the DAU. Sex ratios are difficult to accurately observe in this unit. It is likely that a large proportion of antlered animals, particularly older age class animals, winter in Utah and are not observed during winter classification flights. This leads to what is probably a dramatic under-estimation of the actual bull: cow ratios. Each year, many large, older age class bulls are harvested, quality which generally equates to high bull: cow ratios. It is possible that using random point sampling may provide a more accurate representation of actual bull: cow ratios than current ad hoc method. This unit, in particular, relies heavily on hunter satisfaction and harvest quality to determine the overall quality of bulls.

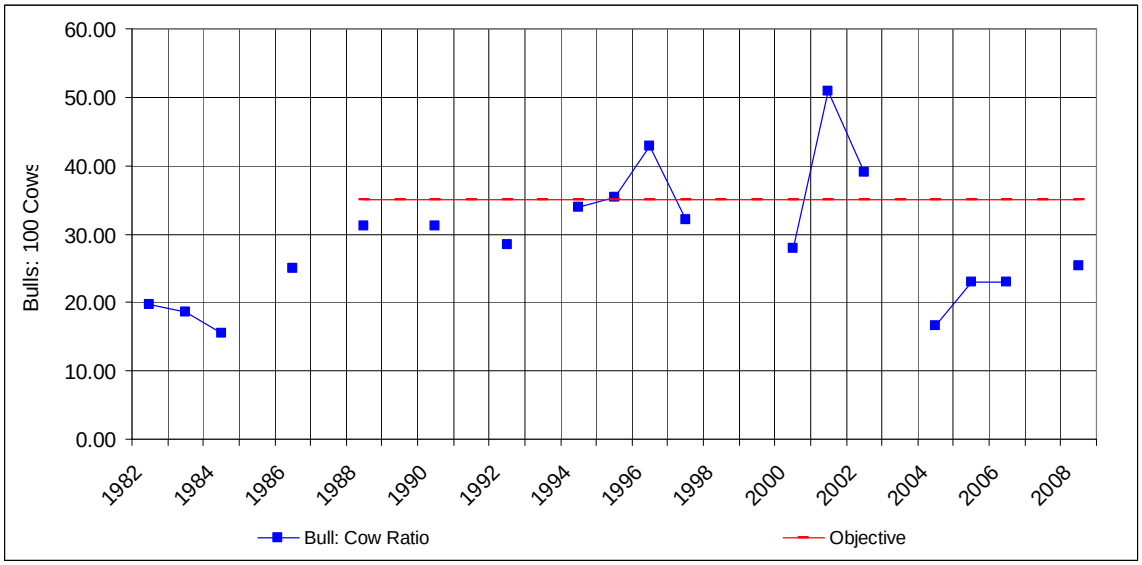


Figure 5. Bull: Cow Ratios in E-19.

- **Calf: Cow ratios**

In 1982 the age ratio was 71.1 calves: 100 cows, the highest ever observed in this DAU (Figure 6). Since that time, it has generally stayed between 50 and 60 calves: 100 cows. Between 1982 and 1992, observations averaged 59.2 calves: 100 cows. The average between 2000 and 2008 was 52.8 calves: 100 cows. It is possible that declining habitat quality has created a density - dependent situation, leading to lower calf: cow ratios.

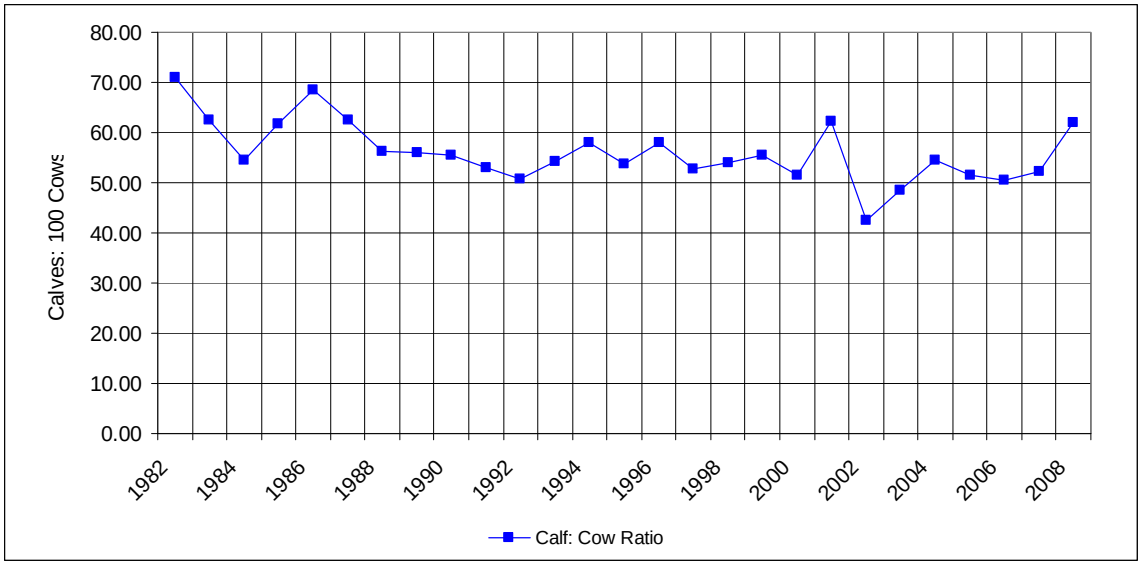


Figure 6. Calves: 100 Cows in E-19.

Harvest History

Elk harvests have changed substantially over time in this DAU (Figure 7). In 1982, 15 antlered animals and 16 antlerless animals were harvested. Antlered harvest increased more than tenfold to 187 in 2008. Antlerless harvest increased to 273 in 2008.

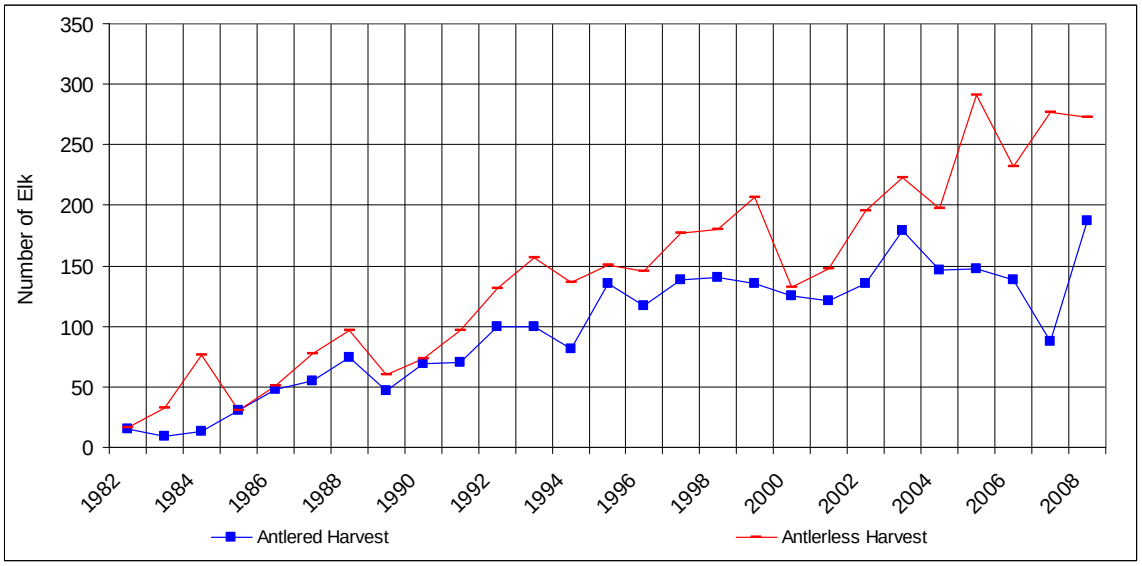


Figure 7. Annual Harvest in DAU E-19.

Elk harvest, particularly antlerless harvest, has increased dramatically over time in response to the increasing elk population. High harvests have succeeded in slowing or reversing the population growth, bringing it closer to the objective size (Figure 8). As the population reaches the objective and stabilizes, it is likely that harvest will also decrease.

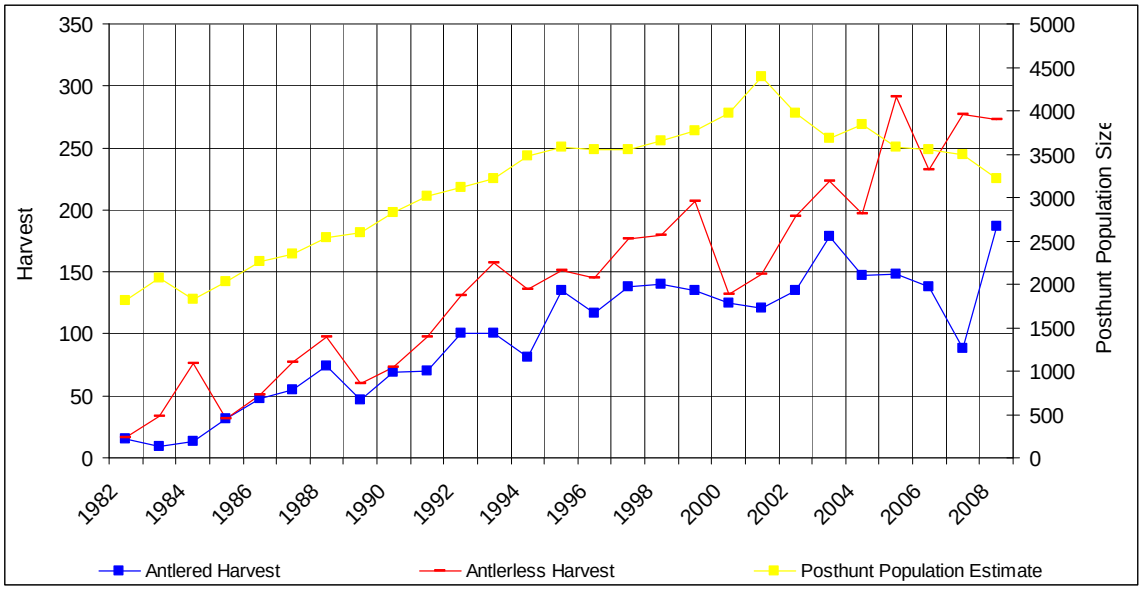


Figure 8. Annual Harvest vs. Population in DAU E-19.

Hunting Pressure and Demand for License Numbers

Hunting pressure is an important issue in this DAU due to the high quality antlered animals harvested in this unit and the high proportion of private land. The majority of hunters concentrate on the USFS land at the higher elevations of the unit, particularly during the early seasons. Hunter concentration has steadily increased in the most sought after hunting areas. Decreasing access to formerly huntable lands has increased crowding on public lands. Increased crowding has also resulted from increased antlerless licenses used to slow population growth.

Since this DAU has been managed for trophy quality animals, license numbers are tightly controlled. However, demand for antlered licenses has increased dramatically. Hunter interest is very high for elk in this DAU as well as the entire state of Colorado. The growth of the herds has stimulated and maintained a high public interest in both the viewing and hunting populations in Colorado.

CURRENT HERD MANAGEMENT

Current Population and Composition Objectives

The current population size objective for the Glade Park DAU E-19 is 2,400 elk, which was established through the DAU planning process and approved by the Wildlife Commission in 1999. The current population estimate is well above 2,400 animals at approximately 3,200. Since the 1980s, the Glade Park elk DAU E-19 has been managed for trophy quality bull harvest, and a bull: cow ratio of 35 bulls: 100 cows. All licenses are completely limited and are in high demand.

Harvest Management

Elk licenses on Glade Park have been totally limited since the 1950s, with the exception of two years in the early 1980s. Using private land only and late seasons, the CDOW has been increasing antlerless hunting opportunity in an effort to increase antlerless harvest and decrease the population size. This strategy has become more effective in recent years, and the population is declining.

Elk seasons have varied over the years. Seasons have evolved from being quite simple to rather complicated. The driving force behind this change has been the dramatic elk population growth and the desire for increased bull quality. The high populations coupled with the many factors exerting their force on populations have driven the hunting process to the format we have now. Both archery and muzzleloading harvest have increased from virtually nothing in the early 1970's to a significant portion of the harvest.

The regular rifle seasons have also changed. In the 1950's and 1960's there was one fall hunting season. Now there are three combined rifle seasons for elk and deer and a single, first season for elk only. The elk-only first season and the three combined seasons have been established to reduce hunter pressure by distributing pressure over four seasons. This has increased the quality of the hunts and allowed more opportunities for the hunters to choose seasons that fit their preferences.

In addition, a private land only season and a late season have been established in this DAU to mitigate and prevent game damage problems and to slow the growth of the population.

Ranching for Wildlife, a statewide CDOW program created to improve public hunting opportunity on private lands, has been a factor in the elk harvest in this DAU since the 1980’s. Over 45,000 acres of elk and deer habitat were enrolled in the program before the ranch left the program in 2007. Between 2003 and 2006, an average of 25% of the bulls harvested in GMU 40 were harvested on the Ranching for Wildlife land.

- **Antlered Licenses**

Antlered hunting in this DAU is completely limited during all seasons. There is significant and increasing demand for early seasons, particularly muzzleloader and the first, elk-only rifle season. In 2008, 268 antlered licenses were issued for all seasons and 187 elk were harvested. Success rates are generally high for all seasons.

- **Regular Season Antlerless Licenses**

Regular season antlerless licenses are available for all four regular elk season through the CDOW's limited license drawing process. In the early 2000's, high numbers of these licenses were issued in an attempt to slow the population growth of this herd. As a result, success rates and hunter satisfaction were lower and hunter crowding was a major issue. In 2006, regular season cow licenses were dropped dramatically. Success rates for cows in these regular seasons have increased by as much as 16% since the change and licenses still do not require preference points to draw.

- **Private Land Only and Late Seasons**

Antlerless licenses for private land only and a late season have been created to provide opportunity and to alleviate situations where elk are causing damage. These licenses been created to encourage harvest of elk when during late fall and early winter. As the population nears objective, it is anticipated that the availability of these licenses will decrease.

HABITAT RESOURCE

Habitat Distribution

- **Elk Overall Range**

Elk are found throughout DAU E-19 with the general exceptions of the largest human population areas, and the desert-like lowlands in the Grand Valley (Figure 9). Elk herds move across the remainder of the DAU during the year, utilizing different areas during different seasons. There are approximately 545 square miles of elk overall range in DAU E-19.

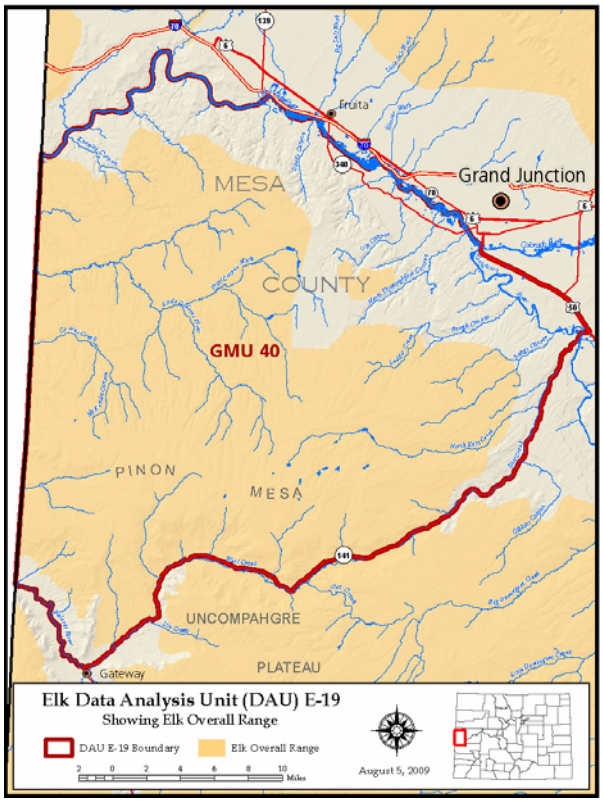


Figure 9. Elk Overall Range in DAU E-19.

- **Elk Summer Range**

Elk in E-19 summer primarily in the highest elevations near the center of the DAU (Figure 10). In the spring, they tend to follow the retreating snowline and subsequent green-up in vegetation. There are over 209 square miles identified as summer range. The quality of summer range is important for elk to ensure they recover from winter weight loss, cows support late fetal development and lactation, and animals in the population go into winter in good body condition.

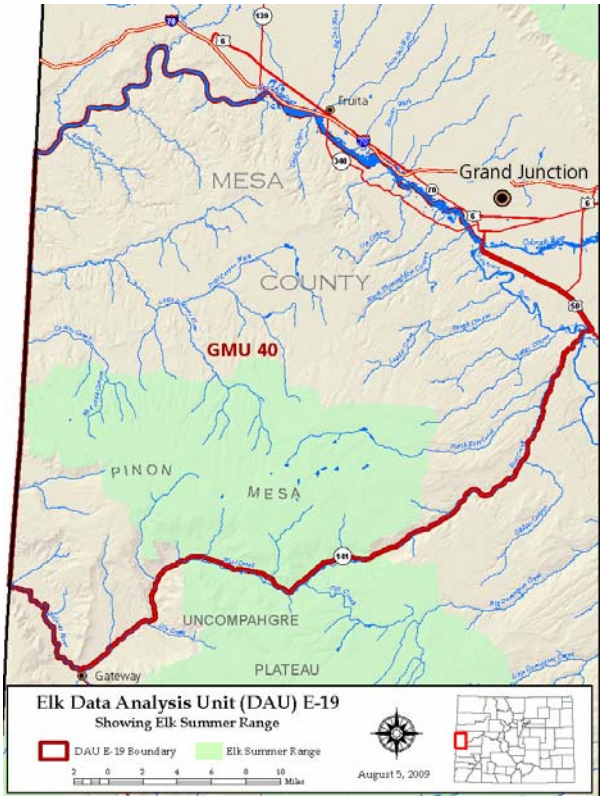


Figure 10. Elk Summer Range within DAU E-19.

- **Elk Winter Range**

Winter range is often considered to be more important to elk than summer range because it is generally more limited due to weather conditions. The CDOW characterizes winter range into winter range, winter concentration areas, and severe winter range. They are defined as:

> *Winter Range:* that part of the range where 90% of the animals are located during average winters.
>
> *Winter Concentration Area*: the part of the range where densities are at least 200% greater than the surrounding winter range in average winters.
>
> *Severe Winter Range:* that part of the range where 90% of the elk are located during the two worst winters in 10 years as determined by the maximum annual snow pack and minimum temperatures.

Due to heavy accumulations of snow in the upper elevations, both deer and elk are forced to winter at lower elevations. There are approximately 426 square miles identified as winter range in DAU E-19. The lands that surround Pinon Mesa at lower elevations comprise important winter ranges for both deer and elk. Areas such as the Spring Creek, Granite Creek, Lost Horse Basin, Jones

Canyon, Unaweep Canyon, and the Little Dolores River support the DAU's elk populations during the winter (Figure 11). Favorable snow depths, slope and aspect, and winter temperatures make these areas suitable for wintering big game. Elk are often found at higher elevations than mule deer due to their ability to forage in deeper snow conditions. However, during severe winters both deer and elk are forced to winter at lower elevations where snow levels are usually the least.

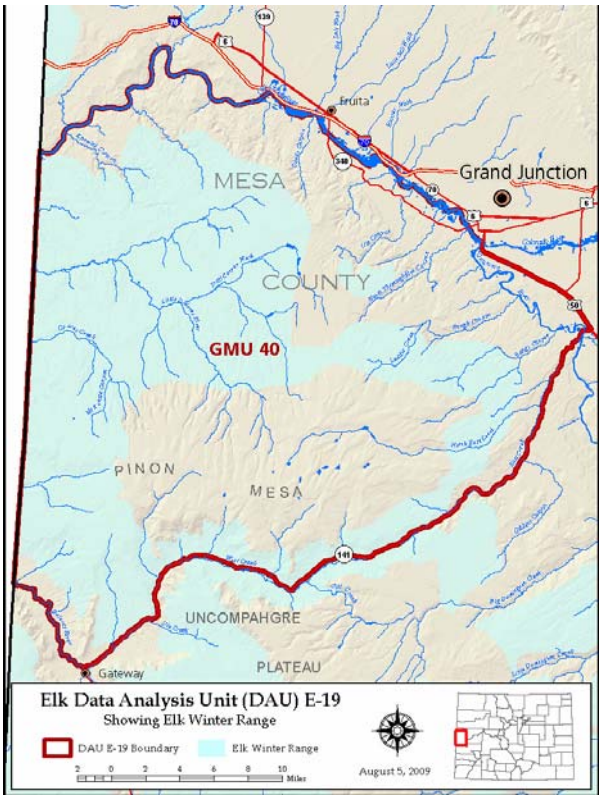


Figure 11. Elk Winter Range in DAU E-19.

- **Land Status in Elk Winter Range vs. Elk Summer Range**

Of the approximately 426 square miles of winter range in E-19, 72% is on public lands and 28% is privately held. The winter ranges are almost entirely on BLM lands.

There are approximately 209 square miles of summer range in E-19. Of this area, 65% is on private land and 35% is on public land. The majority of elk summer range on public land is managed by the BLM (Figure 12).

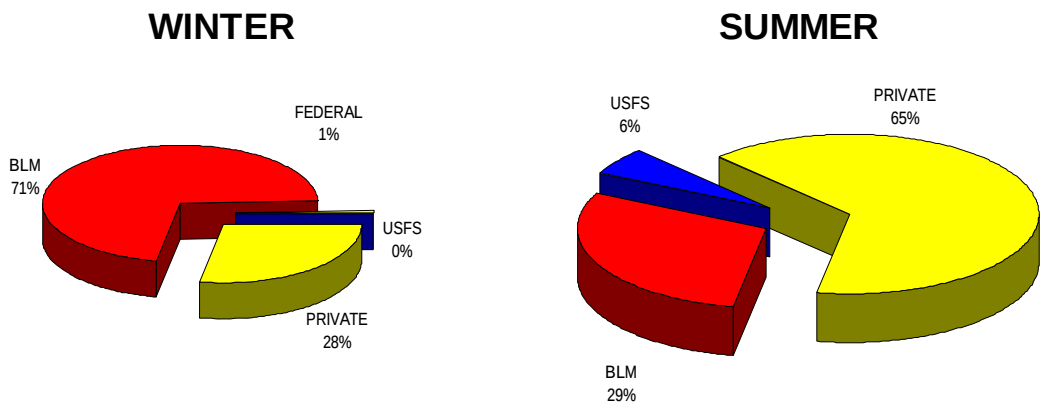


Figure 12. Land Ownership in DAU E-19 in Winter vs. Summer Range.

Habitat Condition and Capability

The value of the habitat resource is measured by both its condition and its capability (quality and quantity). Both aspects are integral in the overall health and value of the environment available to elk and deer. Availability of food, water and cover are the most basic needs of all wildlife. However, many other aspects of habitat condition influence the overall value of the habitat to wildlife.

In many areas in DAU E-19, on both public and private land, the range and browse conditions are good and/or improving. The Bureau of Land Management completed a Land Health Assessment (LHA) of the Colorado Canyons (now McInnis Canyons) National Conservation Area in 2003. The portions of the NCA south of the Colorado River were found to be meeting land health standards 84% of the time. Another LHA on the south side of the unit, the West Creek Land Health Assessment was completed in 2004. Less than 1% of the evaluated land did not meet minimum standards.

Private land conditions are also good, primarily due to careful livestock management, reduced grazing, and habitat improvement projects. Although no broad assessments have been completed on private lands, these areas are generally in good condition and provide excellent habitat to deer and elk.

A significant impact to habitat condition in DAU E-19 is the fragmentation and destruction of habitat as a result of residential development. Deer and elk avoid areas of high activity associated with residential development, causing direct habitat loss. Additionally, roads and fences fragment the landscape and make wildlife more vulnerable to vehicular collisions and poaching. This effectively decreases the overall habitat capability as these areas become essentially useless to elk and deer.

Habitat quality is the single most important factor affecting deer and elk populations throughout Colorado. High quality habitat allows for a higher

sustainable population, maintains the herd in better condition, and provides for better reproduction and survival.

Areas of lower habitat quality are generally the result of a lack of rejuvenation, invasive weeds and increasing recreational use.

Fire suppression has resulted in decadent stands of oaks and sagebrush, as well as pinon-juniper encroachment. Without fire, young, vigorous plants are unable to out-compete the more mature individuals, resulting in older age-class stands of less productive shrubs and trees. These over-mature stands are much more vulnerable to large scale die-offs, particularly in recent drought years.

There are areas in this unit that have seen significant fires in recent years. These fires have generally improved grazing conditions, particularly when native grasses revegetate burned areas. Fresh young grasses immediately come in, improving the overall habitat condition and providing substantial grazing opportunities to elk. Browse species that more directly benefit deer, take longer to reestablish.

Invasive weeds such as cheatgrass, houndstongue, thistles, leafy spurge, and knapweeds are increasing dramatically in this DAU. These are brought in through residential development, increasing motorized recreation, and widespread development. These invasive species do not have the nutritional value of native species and decrease the amount of forage available to deer and elk.

Conflicts

The State of Colorado is liable for compensating landowners for documented damage to commercial agricultural products, livestock forage, and fences by elk and other big game provided the landowner allows reasonable hunting access. Due to the high value of bull licenses, and subsequent high fees charged for hunting access, there are very few landowners who qualify for game damage payments. Although there are some areas with high concentrations of elk, complaints are rare.

The deer population in the overlapping DAU (D-18) is stable to slightly increasing (Figure 13). There is some concern that the elk herd has negatively impacted the deer herd through direct competition for spatial and forage resources.

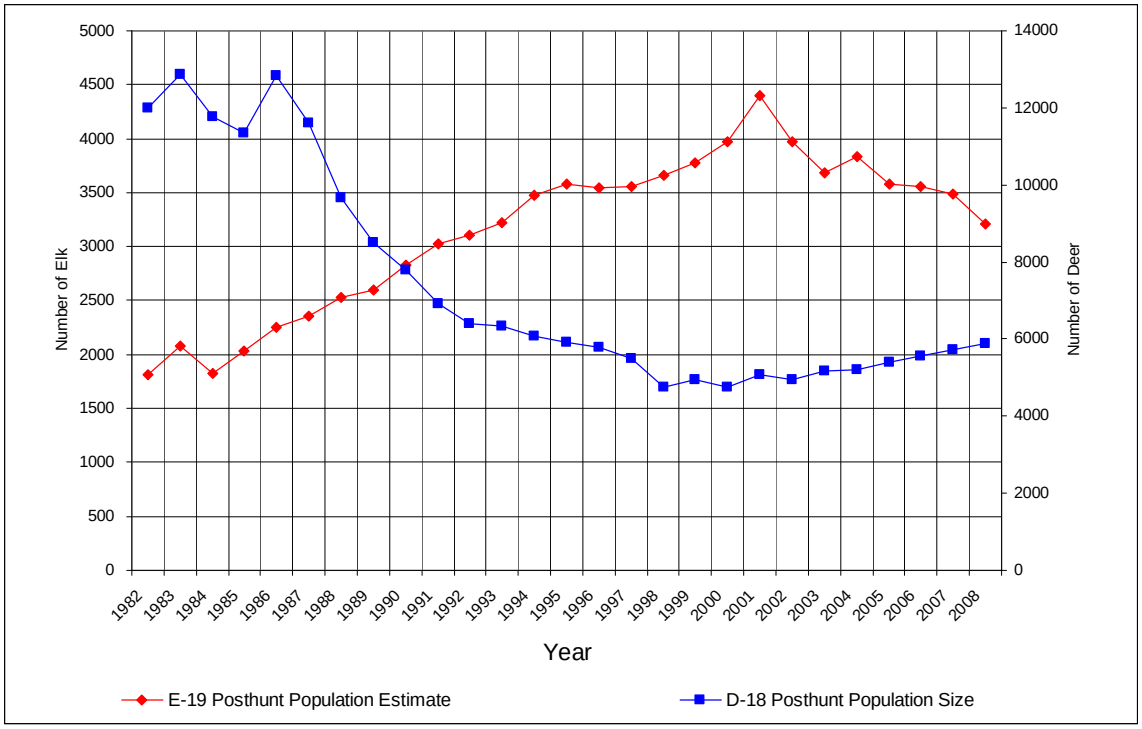


Figure 13. Elk and Mule Deer Populations in E-19 and D-18.

Although a direct relationship has never been scientifically supported, state-wide mule deer declines have coincided with increasing numbers of elk. Several studies in the western U.S. have shown that mule deer and elk have only moderate dietary overlap except during periods of food shortage such as during severe winters. Elk generally prefer to graze on grass, sedges, and forbs during much of the year; while deer tend to prefer forbs, young grasses, and new leader growth during the growing season, and select browse during the winter. Thus, except during severe winters, dietary overlap is probably minimal. It is likely that within DAU E-19 there is some competition between elk and mule deer, but mule deer population declines within the DAU are probably more directly related to habitat fragmentation, drought, undesirable vegetative communities, and increased human activity than simply increased elk numbers.

ISSUES

Issue Solicitation Process

The most important aspect of the DAU planning process is obtaining input from all segments of the affected local populations, including the USFS, BLM, and interested public.

In an effort to solicit information from the interested public, the CDOW held open public meetings in Grand Junction and Glade Park during August of 2009, to gather recommendations on the goals and objectives of the DAU plan.

The Mesa County Board of County Commissioners (BOCC) was also requested to provide input on the draft management plans and was invited to the local public meetings. No comments were received.

Letters were sent to interested stakeholders and land management agencies. A questionnaire was available at the public meetings and on the internet to further encourage public input.

Issue Identification

There are many issues associated with elk management in DAU E-19. The primary goal of this management plan is to document those issues and, whenever possible, to identify strategies for resolution through solid wildlife management principles. Some primary concerns that have been identified in this area are elk competition with deer, agriculture and domestic livestock; hunting opportunity and quality, and habitat quality and quantity. This is an adaptive process and the DAU process is repeated on a regular basis to account for the changing conditions within this DAU.

One major issue that was brought up myriad times during the planning process, but is not within the scope of the DAU plan, was license allocation. Due to the high value of antlered licenses, and the significant portion of this unit that is private land, competition between landowners for licenses is increasing. There is significant opposition to Ranching for Wildlife, and strong interest in altering the distribution of limited licenses in E-19. Interested parties were encouraged to participate in the upcoming Big Game Landowner Voucher Review Committee.

- **Issues and Concerns: CDOW**

  Housing/Ex-Urban Development

The DAU has had substantial development in areas that were once part of elk winter range, particularly in the areas surrounding Glade Park. The Unaweep Canyon is also experiencing increasing development, although to a lesser extent. Ranches have been subdivided and natural habitat quality is significantly reduced by fragmentation. 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 for elk and puts added pressure on remaining lands. It is likely that this will continue to escalate in coming years.

Maintenance of Quality Antlered Harvest and Meeting Public Demand for Elk Resource

CDOW's current objective is to maintain E-19 as a highly productive elk population that can annually support a harvest similar to those it has supported in the past. This DAU is managed primarily to provide quality antlered harvest. However, the maintenance of population levels and quality harvest that are acceptable to all segments of the interested publics is very difficult to achieve.

High populations have led to increased damage complaints in the past, but have also resulted in very high numbers of available licenses. As populations decrease toward current objective levels, there is concern that decreased license numbers will result in complaints from sportsmen who have traditionally made use of these licenses.

Additionally, maintaining the resource of high quality bulls is a major concern and of significant interest to both internal and external publics. Accurate documentation of bull: cow ratios during winter surveys is an ongoing challenge.

Hunter Access

An ongoing problem in the DAU is access to huntable lands by non-landowning hunters. With nearly 40% of the land owned by private entities, access is difficult, particularly during hunting seasons. Large tracts of privately-owned and inaccessible property create huge preserves, concentrating the elk, and reducing harvest opportunity. The problem is most critical in the highest elevations, during early seasons. Access issues are complicated by the monetary value that can be derived from hunters and access fees.

Although these issues cannot be addressed through the DAU planning process, they should be considered during the review of landowner vouchers and license allocation.

- **Issues and Concerns: BLM**

Input from the Bureau of Land Management's Grand Junction field office was requested by mail and attendance by BLM personnel at the public meetings was encouraged. Information regarding Land Health Assessments (referenced elsewhere in this document) was received. No other input or concerns were received.

- **Issues and Concerns: USFS**

Input from the Grand Mesa National Forest office was requested by mail and attendance by USFS personnel at the public meetings was encouraged. No input or concerns were received.

- **Issues and Concerns: Public Stakeholders**

Two public meetings were held to provide information regarding the DAU planning process and to solicit input from concerned stakeholders. At these meetings, current management objectives were presented and alternatives were presented. Input was requested, in the form of an optional questionnaire (APPENDIX C: PUBLIC QUESTIONNAIRE), from participants at the time of the meeting regarding any issues or concerns. This questionnaire was also made available on the internet. Twenty-two questionnaires were returned.

Several issues were identified as important to public stakeholders during this process. The majority of individuals contacted expressed concerns relating to bull quality, population size, and hunting opportunity. Concern was also expressed about residential development, loss of habitat, the revenue associate with elk hunting and, to a lesser degree, damage to agricultural crops.

Analysis of the questionnaire that was distributed at the public meetings and made available on the internet indicates that the majority of respondents wanted the elk population size to remain at current levels and the number and quality of bulls to remain the same or increase. There was more demand overall for trophy bull harvest than for providing opportunity.

The most commonly identified issue during the public input process was inequities resulting from landowner vouchers and priority drawings. Much of the elk range is privately owned and access is limited. There is significant discord relating to how licenses are distributed and where hunters can hunt elk. Ranching for Wildlife in this DAU was also identified as a major concern.

A full analysis of the questionnaire responses, as well as full text of written comments, is included in APPENDIX B: COMMENTS FROM PUBLIC STAKEHOLDERS WITH QUESTIONNAIRE ANALYSIS.

- **Issues and Concerns: County Commissioners**

The Board of County Commissioners from Mesa County was contacted as part of this DAU planning process. They were provided with a background of the planning process and encouraged to attend the public meetings. No comments are received from the BOCC.

ALTERNATIVE DEVELOPMENT

During this process, the various interested groups were made aware of three alternatives to population size and composition. Both population size and composition must be considered when determining objectives and management strategies for this herd as both characteristics of the herd will dramatically influence management regimes.

Post-hunt Population and Sex Ratio Objective Alternatives

- **Population Objective Alternatives**

2,400-3,300 elk; 3,300-4,200 elk; 4,200-5,000 elk

- **Sex Ratio Objective Alternatives**

25-30 bulls: 100 cows; 30-35 bulls: 100 cows; 35-40 bulls: 100 cows

Impacts of Objective Alternatives

- **Population Objective Alternatives**

Population objective determine the overall number of elk in the herd, regardless of sex or age class. Changes in population size objectives will impact the number of elk in the unit, interspecific competition, quality of the habitat, game damage conflicts, and available antlerless licenses.

Alternative 1: 2,400 – 3,300 elk:

This alternative would result in a 20% decrease in the population size of this herd from the average of 2004-2008, resulting in the lowest population levels in nearly 20 years.

Antlerless License Impacts: Initially, antlerless license numbers would increase, probably through more late seasons and additional licenses in regular seasons. Soon, however, harvest would necessarily decrease and late seasons would probably be eliminated. Private land hunts might not be necessary or would be reduced in duration or authorized on some other yearly rotation. This would mean a larger portion of the harvest would take place during regular seasons.

Antlered License Impacts: Changes to antlered licenses don't generally affect population size. However, once this population decreases, there will be a consequent decrease in the number of bulls overall, leading to a decrease in the number of antlered licenses available.

Fiscal Impacts: In order to achieve a lower population level license sales would initially increase. However, a lower population could not sustain the harvest levels currently maintained. This would cause lower license numbers, reducing income to local communities and to the CDOW. Game damage payments would likely be reduced, even during bad winters.

Alternative 2: 3,300 – 4,200 elk:

This alternative would maintain the population size of this herd at current levels. There would be no change in license numbers or management regimes. Antlerless licenses will remain limited and overall numbers will be set at maintenance levels, while antlered licenses would remain at current levels. Some decreases in antlerless licenses may be necessary as management strategies move from a herd reduction mode to a maintenance mode.

Alternative 3: 4,200 – 5,000 elk:

This alternative would result in a 30% increase in the population size of this herd from the average of 2004-2008, surpassing population levels from the early 2000's.

Antlerless License Impacts: There would be an initial decrease in license numbers, followed by an increase. Antlerless licenses would remain limited and overall numbers would most likely decrease dramatically to allow the herd to grow. Once the herd reaches objective, however, there would be more antlerless licenses available.

Antlered License Impacts: Changes to antlered licenses don't generally affect population size. However, once this population increases, there will be a consequent increase in the number of bulls overall, leading to an increase in the number of antlered licenses available.

Fiscal Impacts: Initially, license sales would drop fairly dramatically since the population would need to be increased to the new level. Income to the CDOW and local communities would decrease to allow the population to grow, then would likely increase.

- **Sex Ratio Objective Alternatives**

Sex ratio objectives determine the number of bulls: 100 cows. This characteristic most directly impacts the number of licenses issued and the quality and quantity of bulls that are available to be harvested. Since the population size objective is established separately, the total number of elk in not relevant when selecting sex ratio alternatives.

Sex ratios are difficult to accurately observe in this unit. It is likely that a large proportion of antlered animals, particularly older age class animals, winter in Utah and are not observed during winter classification flights. This leads to what is probably a dramatic under-estimation of the actual bull: cow ratios. Each year, many large, older age class bulls are harvested, quality which generally equates to high bull: cow ratios. It is possible that using random point sampling may provide a more accurate representation of actual bull: cow ratios than current ad hoc method. This unit, in particular, relies heavily on hunter satisfaction and harvest quality to determine the overall quality of bulls.

Alternative 1: 25-30 bulls: 100 cows:

This alternative would decrease the objective number of bulls within the population, and therefore would decrease the number of older age-class animals available to be harvested.

Antlered License Impacts: This alternative would increase available antlered licenses both long and short term. The CDOW would direct hunting pressure to the male segment of the population.

Alternative 2: 30-35 bulls: 100 cows:

This alternative would maintain the number of bulls in this herd at current levels. There would also be no change in the season structure.

Alternative 3: 35-35 bulls: 100 cows:

This alternative would increase the number of bulls in this herd. There would be more older age-class bulls available for harvest. It is likely that the size of harvested bulls would increase. Fewer antlered licenses would be available both long and short term.

APPENDIX A: ELK POPULATION DYNAMICS

Numerous studies of biological populations of such species as bacteria, mice, rabbits, and white-tailed deer have shown that animal populations grow in a mathematical relationship that biologists refer to as a "sigmoid growth curve" or "S" curve (Figure 14). There are three distinct phases to this cycle. The first phase occurs while the population level is still very low and is characterized by a slow growth rate and a high mortality or death rate (see A in Figure 14). This occurs because the populations may have too few animals and the loss of even a few of them to predation or accidents can significantly affect the population. In other words, there appears to be some truth to the old saying "There's strength in numbers".

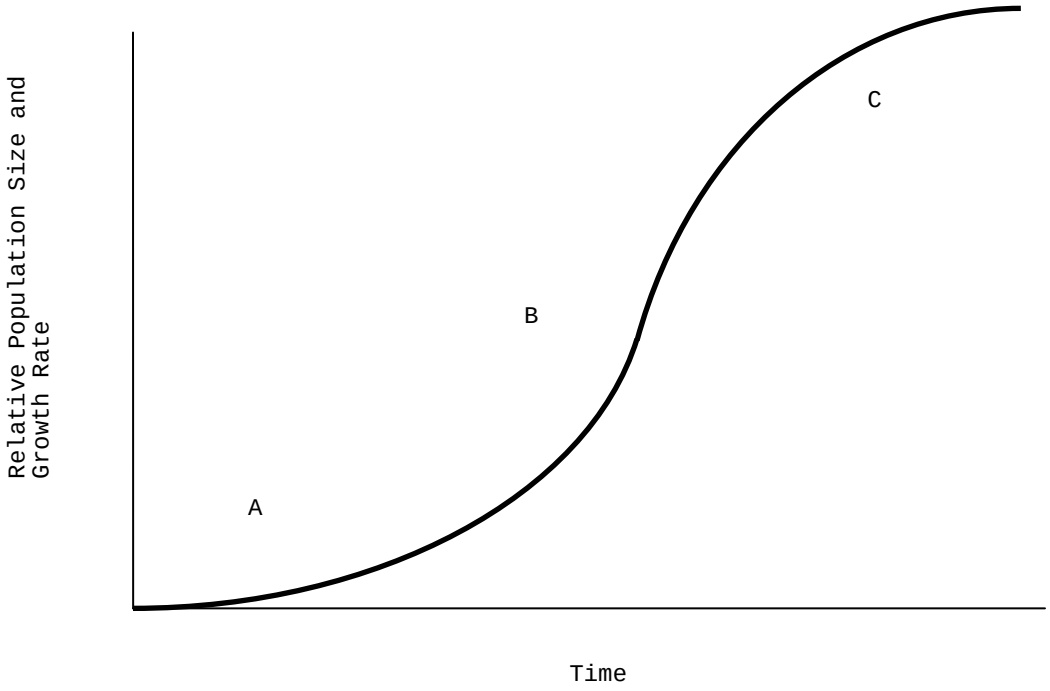


Figure 14. Sigmoid Growth Curve.

The second phase occurs when the population number or density is at a moderate level. This phase is characterized by a very high reproductive and survival rate (see B in Figure 14). During this phase, food, cover, water, and space (habitat) is optimal and abundant. These high reproductive rates during this phase can be seen in white-tail deer, when does may breed successfully at 6 months of age and produce a live fawn on their first birthday. Older does have been known to produce 3-4 fawns that were very robust and healthy. Survival

rates of all deer (bucks, does, and fawns) are at maximum rates during this phase.

The third and final phase occurs when the habitat becomes too crowded. The quality and quantity of food, water, cover, and space become scarce and poor due to the competition with other members of the population. This phase is characterized by decreased reproduction and survival (see C in Figure 14). For example, white-tail deer fawns can no longer find enough food to grow to a critical minimum weight to reproduce; adult does will only produce 1-3 fawns, and survival of all deer (bucks, does, and fawns) decreases. During severe winters, large die-offs can occur due to overcrowding and lack of forage. The first to die in these situations are fawns, followed by bucks, finally followed by adult does. Thus, severe winters affect future buck: doe and fawn: doe ratios by favoring more does in the populations. Additionally, since buck's antlers are dependent upon nutrition, antlers are stunted during this phase.

If the population continues to grow, it will eventually reach the maximum carrying capacity, or "K" (Figure 15). At this point, the population reaches a dynamic equilibrium with the habitat. The number of births each year equals the number of deaths, therefore, maintaining the population at this level would not allow for any "huntable surplus." The animals in the population would be in relatively poor condition and when a severe winter or other catastrophic event occurs, a large die-off is inevitable. Thus, another old expression, "the bigger they are the harder they fall" may be appropriate here. A recent example of such a population die-off occurred in the relatively unhunted Northern Yellowstone elk herd during the severe winter of 1988-89. This winter followed the forest fires of 1988 that raged in the National Park.

What does all this mean to the management of Colorado's big game herds such as deer and elk? It means that if we attempt to manage for healthy big game herds, we should attempt to hold the populations at about the middle of the "sigmoid growth curve." Biologists call this "MSY" or "maximum sustained yield." At this level, which is exactly half the maximum population size or "K", the population will display the maximum production, survival and available surplus animals for hunter harvest (Figure 15). Also, at this level, range condition and trend should be good to excellent and stable, respectively. Game damage problems should not be significant and economic return to the local and state economy should be at the maximum. This population level should produce a "win - win" situation to balance sportsmen and private landowner concerns.

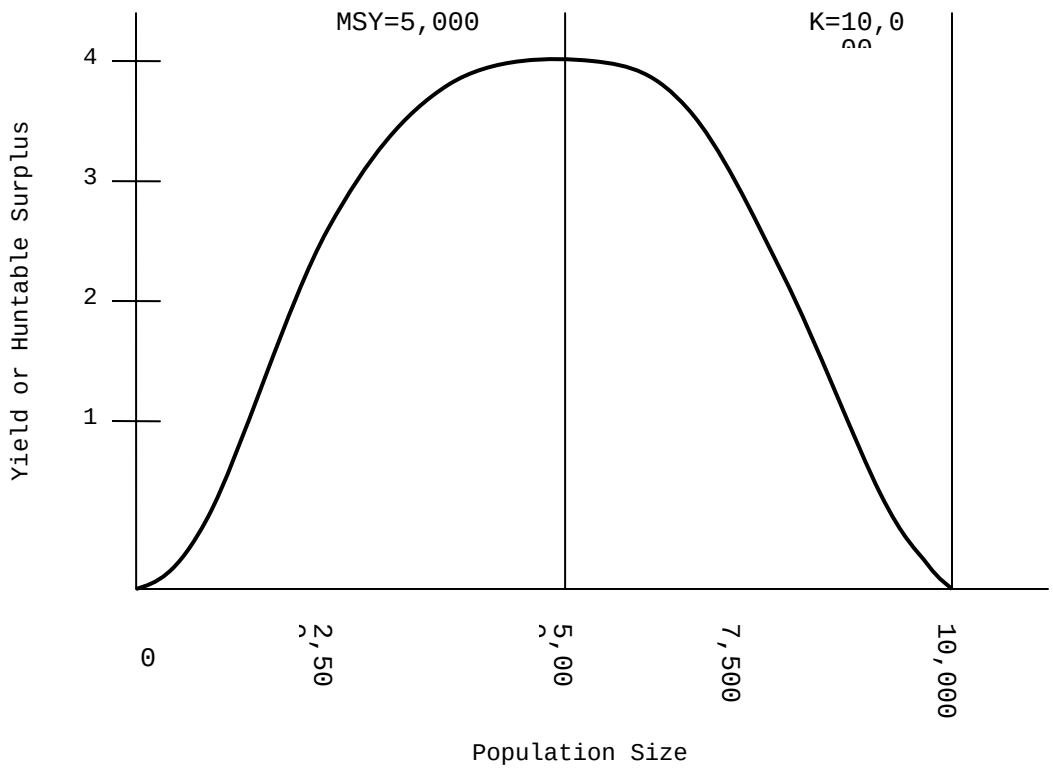


Figure 15. Maximum Sustained Yield and Maximum Carrying Capacity.

A graph of a hypothetical deer population showing sustained yield (harvest) potential vs. population size is shown above. Notice that as the population increases from 0 to 5,000 elk, the harvest also increases. However, when the population reaches 5,000 or "MSY", food, water and cover becomes scarce and the harvest potential decreases. Finally, when the population reaches the maximum carrying capacity or "K" (10,000 elk in this example), the harvest potential will be reduced to zero. Also, notice that it is possible to harvest exactly the same number of elk each year with 3,000 or 7,000 elk. This phenomenon occurs since the population of 3,000 elk has a much higher survival and reproductive rate compared to the population of 7,000 elk.

APPENDIX B: COMMENTS FROM PUBLIC STAKEHOLDERS WITH QUESTIONNAIRE ANALYSIS

Questionnaire Answers

Background Information

- **Question 1:**

Respondents: 21
Resident: 21
Non-resident: None

All respondents were residents of Colorado.

- **Question 2:**

Respondents: 21
Residents of E-19: 16
Non-residents of E-19: 5

A majority of respondents lived within DAU E-19.

- **Question 2A:**

Respondents: 15
Average length of residence: 26.8 years
Median length of residence: 25.0 years
Minimum length of residence: 2 years
Maximum length of residence: 66 years

The average length of residence in DAU E-19 was 26.8 years.

- **Question 3:**

Respondents: 20
Landowners in E-19: 16
Non-landowners in E-19: 4

The majority of respondents own or lease property in DAU E-19.

- **Question 3A:**

Respondents: 15
Average length of property ownership: 25.8 years
Median length of property ownership: 25.0 years
Minimum length of property ownership: 3 years
Maximum length of property ownership: 60 years

The average length of property ownership in DAU E-19 by 12 respondents was 25.8 years.

- **Question 4:**

Respondents: 21

A: 5
B: 3
C: 13
D: 3
E: 20
H: 5
I: 1

Respondents identified themselves most frequently as hunters, followed by landowners. Ranchers and environmentalists were less common.

- **Question 5:**

Respondents: 19

A: 3
B: 0
C: 2
D: 1
E: 13
H: 0
I: 0

The majority of respondents identified hunters/sportspersons as the group that best represents their interests in elk management. Three and two respondents, respectively, identified with as rancher/farmers and landowners groups. Only one individual responded that guide/outfitter groups best represent his interests.

People and Elk

- **Question 1:**

Respondents: 17

A: 2.6
B: 3.1
C: 2.1
D: 3.2
E: 4.1
F: 3.2
G: 2.3
H: 3.0
I: 3.2
J: 3.6

Respondents most frequently indicated that they were very concerned about loss of habitat. Elk/deer conflicts and the revenue from hunting were the next most significant concerns, followed by economic losses to rancher/farmers. Damage to homeowners' trees, shrubs, and gardens caused the least concern among all respondents.

- **Question 2:**

Respondents: 21
Affected: 16
Not-affected: 5

The majority of respondents had been personally affected in some way by one or more of the concerns.

- **Question 2A:**

Respondents: 11

A: 1
B: 0
C: 2
D: 2
E: 4
F: 0
G: 0
H: 2
I: 0
J: 0

The majority of respondents had been personally affected by loss of elk habitat due to increased human population and development.

- **Question 3:**

Respondents: 21
Do not enjoy/nuisance: 0
Enjoy/worry: 7
Enjoy/don't worry: 14
No opinion: 0

Fourteen out of 17 respondents indicated that they enjoy the elk in E-19 and do not worry about the problems they cause. Seven of the respondents indicated that they enjoy the elk and do worry about problems they cause.

Elk Management

- **Question1:**

Respondents: 21
Decrease: 3
Stay the Same: 10
Increase: 8
Don't know: 0

Slightly less than half of respondents wanted the elk population size to remain the same. A smaller percentage wanted to increase the population size, while a very small number wanted the population size to decrease.

- **Question 2:**

Respondents: 20
Decrease: 4
Stay the Same: 9
Increase: 7
Don't know: 0

Slightly less than half of respondents wanted the elk population size objective to remain the same. A smaller percentage wanted to increase the population size objective, while a small number wanted the population size objective to decrease.

- **Question 3:**

Respondents: 21
Not Important: 1
Slightly Important: 6
Important: 5
Very Important: 9
Don't know: 0

A majority of respondents indicated that this was either important or very important.

- **Question 4:**

Respondents: 21
Decrease: 4
Stay the Same: 10
Increase: 7
Don't know: 0

The majority of respondents wanted the number of bull elk to stay the same or increase.

- **Question 5:**

Respondents: 21
Decrease: 2
Stay the Same: 15
Increase: 4
Don't know: 0

A majority of respondents wanted the objective for bull elk to stay the same.

- **Question 6:**

Respondents: 20
Hunt every year: 6
Equally important: 5
Trophy: 9

The largest group of respondents indicated that it was more important to harvest a trophy animal than to hunt every year. Nearly equal numbers indicated it was either more important to hunt every year or that it was equally important.

Elk Hunting

- **Question1:**

Respondents: 21
Hunted: 21
Not hunted: None

All respondents had hunted elk in Colorado.

- **Question 1A:**

Respondents: 20
Average length of hunting: 28.0 years
Median length of hunting: 30.0 years
Minimum length of hunting: 15 years
Maximum length of hunting: 40 years

All respondents had hunted in Colorado for at least 15 years.

- **Question 2:**

Respondents:	21
Hunted in E-19:	17
Not hunted in E-19:	4

The majority of respondents had hunted in DAU E-19.

- **Question 3:**

Respondents:	18
Very Dissatisfied:	2
Slightly Dissatisfied:	2
Neutral:	1
Slightly Satisfied:	7
Very Satisfied:	6

Thirteen out of eighteen respondents indicated that they were slightly or very satisfied their hunting experience in E-19.

- **Question 4:**

Respondents:	18
Extremely Crowded:	1
Moderately Crowded:	5
Slightly Crowded:	7
Not at all Crowded:	5

Opinions on crowding varied-nearly equal respondents identified feeling moderately, slightly, or not at all crowded. The largest group was respondents who felt slightly crowded.

- **Question 5:**

Respondents:	15
Less Hunter crowding:	2
Higher Hunter Success Rates:	0
Less motorized travel:	1
More mature bulls:	6
More elk:	6

Six of fifteen respondents indicated that seeing more elk was the most likely way to improve their elk hunting experience in E-19. Six of fifteen respondents indicated that seeing more , mature bulls was the most likely way to improve their elk hunting experience in E-19.

- **Question 6**

Respondents:	21
Poor:	3
Fair:	4
Good:	7
Very Good:	3
Excellent:	4
No Opinion:	0

Seven out of twenty-one respondents indicated that the quality of elk hunting in E-19 is good. Four respondents rated it excellent, while three respondents each rated it as poor and very good.

- **Question 7:**

Respondents:	19
Not seeing other hunters:	2
Obtaining game meat:	10
Trophy:	7

Of the nineteen respondents, only two indicated that not seeing other hunters was most important to them when hunting in E-19. Ten reported that obtaining game meat and 7 reported harvesting a trophy elk was most important.

Text of Comments from Questionnaires

E-1

I have not had the opportunity to hunt DAU E-19, but have assisted successful hunters in retrieving their kills. I am employed by a landowner on Pinyon Mesa, and have had the pleasure of spending the last 2 summers working on their property, not only developing the homesite, but also improving the overall habitat quality.

E-2

No comments.

E-3

It would be nice to be able to hunt elk where I live more frequently. (even cows-archery) cow only archery tags available.

E-4

4,200-5000.

E-5

Need to overhaul landowner voucher program – Does not work as is.

1 – Vouchers drawn must be used on parcels or property used to draw them

2 – Parcels should be required to be used for agricultural income in order to qualify.

Thanks (name removed).

E-6

No comments.

E-7

Honestly I have never hunted elk in this area But would like chance future But this year First year that I have seen elk in 5 years. I have hunt up their. Honestly would like see land owner give us opportunity to take youth up for Hunting. I this area Both Elk & Deer.

E-8

Under elk hunting, question #5, The one thing that would improve my hunting would be more access to private property. The loss of the The Ranching for Wildlife area greatly decreased my opportunity because big game now are increasingly on private land and under no pressure to migrate to public hunting areas.

Talking to owner of large areas of land in GMU-40 shows many are extremely dissatisfied with the PLO vouchers and, as a result, will not let me hunt their land. I realize this is a political situation but it does need more work.

E-9

No comments.

E-10

To the Colorado Division of Wildlife: For Additional comments for DUA E-19 (GMU 40). My concerns for this unit (GMU 40) is that I like the way you are managing this unit for Elk and It is nice to see so many Elk than in years past. It would be nice if you would let a little more either

sex tags out, I have seen way more bulls than cows when scouting and hunting this unit, and know there is more cows. I went to your meeting at the Orchard Mesa Veterans Park and am glad you gave me a sportsman and hunter a chance to put my input in and opinions on the game management update. At the meeting you said that drought conditions and lighting fires have a big in-pack on the deer and elk in this unit, the more grass that grows helps the Elk herds and decreases the deer herds because it decrease the browsing food sources and I found that very interesting. The one thing that I don't want to see is more ranching for wildlife, I think it is bad for both deer and elk. Overall "I think your doing a great job so far!"

Sincerily: From a hunter and native. (name removed).

E-11

No comments.

E-12

I would like to see the bull cow ratio more accurately determine_I would also like to see Unit 40 as a high quality Bull unit _ The elk during hunting season remain mostly on private lands. The licenses need to be somehow obtained by the private landowners. Public licenses are high with low success rates and private land licenses are low with high success rates. Go figure_

E-13

I would like to see the system reworked – it would be nice to get some real benefits for all the elk I feed – (50 to 200 head) on my hay fields – April thru Nov. even-tho I don't own a lot of land! Ranching for wildlife and the Voucher is just a Big money game – as I see it How about me selling just one Voucher to recupe my losses – Or maybe the work release program can come fix my fences all summer long! so I can do more important things

Maybe Vouchers could be issued on damage done instead of acres owned?

Ranching for Wildlife – as a Rancher if I keep selling off all the best livestock and keeping all the culls myself the gene pool Isn't going to last long.

Also Ranching for Wildlife starts blasting away with High Power Rifles while the public is trying to sneak around to give Archery or Musket ball Driving the Elk deep within private property-How about fair for everyone not just Big land and Big Money

E-14

No comments.

E-15

No comments.

E-16

Need access with vehicles to get around and haul out if kill is made. Need to see more elk, need more access. I had a friend that got tag in 2007 but we did not fill it partly cause was new to hunt for elk.

E-17

1. I own a large parcel and am in the priority landowner system. The voucher system needs overhauled and get back to the reason it was started to compensate landowner for game damage. We have landowner in the system that get voucher that don't have elk or deer on ther property.

2. The division needs to inform the public that the majority of the land in unit 40 is private and in order to control elk population the division need to get permits to the landowner to control the numbers.

3. The bull to cow numbers you have are way off. On the land I owne and control the BLM the bull to cow ratio is close to 50 to 60 bulls per 100 cows. Even with the PLO cow tags I receive we have a hard time [*illegible*] cow in the Oct to Nov time frame, we just find bulls.

4. Ranching for Wildlife was discontinued a few years ago and the quality of bulls are really coming back. I am not in favor of bring Ranching for Wildlife Back unless it can be run in the same timeframe and method of take as the reg elk seasones – it is just wrong to hunt mature bulls in the rutt with a rifle and is a disgrace to allow this to happen as game [*illegible*].

E-18

No comments.

E-19

No comments.

E-20

No comments.

E-21

No comments.

E-22

No comments.

APPENDIX C: PUBLIC QUESTIONNAIRE

OPPORTUNITY FOR PUBLIC COMMENT

ELK MANAGEMENT

Pinon Mesa
COLORADO

Data Analysis Unit E-19
(Game Management Unit 40)

The Colorado Division of Wildlife is interested in your opinions about elk management on Pinon Mesa. The results of this effort will help wildlife managers update the elk management plan for this area. This questionnaire is your opportunity to provide input on the management of elk in Game Management Unit 40.

Colorado Division of Wildlife
Northwest Region Service Center
711 Independent Ave.
Grand Junction, CO 81505

August 2009

Dear Interested Citizen:

The Colorado Division of Wildlife (CDOW) is interested in your opinions about elk on Pinon Mesa, Game Management Unit (GMU) 40. Wildlife managers have begun the process of updating the elk management plan for this area, which will affect future harvest strategies and license setting.

In Colorado, big game populations are managed for a specific geographic area, which we call a Data Analysis Unit (DAU). A DAU may include one or more GMU's. In this case, the Pinon Mesa DAU includes only GMU 40. The purpose of the DAU plan is to determine: 1) how many elk the DAU should support, and 2) what sex ratio (number of bulls per 100 cows) the herd be managed for.

The DAU planning process attempts to balance biological considerations with public preference. An appropriate balance is sought and reflected in the elk herd objectives (population size and sex ratio). Annual hunting seasons are then designed with the intent of keeping the population within the selected herd objective range.

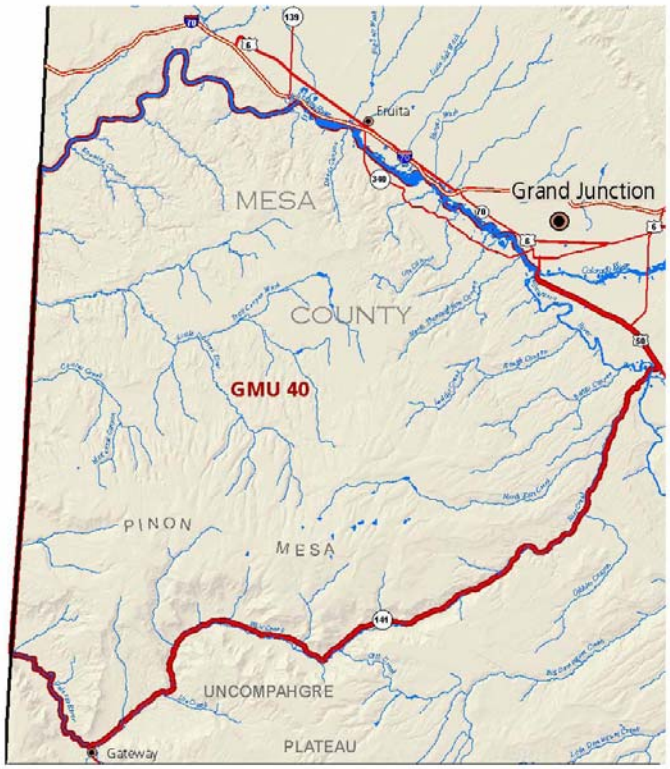
Your input is an important part of the DAU planning process. The information you provide will help develop CDOW's recommendation for elk herd objectives (population size and sex ratio) on Pinon Mesa. Our recommendation will then be incorporated into the DAU plan, which will be reviewed, and ultimately approved, by the Colorado Wildlife Commission.

Surveys must be returned to the CDOW Grand Junction Service Center by September 30, 2009.

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS SURVEY. YOUR INPUT WILL HELP THE COLORADO DIVISION OF WILDLIFE MANAGE YOUR WILDLIFE!

TO RETURN THIS QUESTIONNAIRE:
Please fold in half on dotted line, tape it closed (do not staple) and complete during the meeting, hand deliver, or mail to:
Colorado Division of Wildlife
711 Independent Ave.
Grand Junction, CO 81505,

First, please examine the map and written description of the areas designated as Data Analysis Unit E-19, Game Management Unit 40, located in West-Central Colorado, then go to Question 1.



Description of DAU E-19:
It is bounded on the north by the Colorado River; on the east by US Hwy. 50; on the south by Colo. Hwy. 141 and Dolores River; and on the west by the UT-CO state line.

BACKGROUND INFORMATION

1) Are you a resident of Colorado?
   _____ Yes
   _____ No

2) Do you live in DAU E-19 (GMU 40)?
   _____ Yes If yes, how many years?_____
   _____ No

3) Do you own or lease property in DAU E-19?
   _____ Yes If yes, how many years?_____
   _____ No

4) Which group(s) best represent your interests in elk management in DAU E-19? *(Check all that apply)*

   _____ A) Rancher/Farmer
   _____ B) Business owner
   _____ C) Landowner
   _____ D) Guide/Outfitter
   _____ E) Hunter/Sportsperson
   _____ H) Environmental/Conservation
   _____ I) Other, please explain _____

5) If you checked more than one response in the above question, write the letter corresponding to the interest group which most represents your opinions. ____

ELK MANAGEMENT

1) How would you like the elk population in DAU E-19 to change, if at all?
   _____ Decrease
   _____ Stay the same
   _____ Increase
   _____ Don't know

2) The population is currently above the population objective. How would you like the elk population **objective** in DAU E-19 to change, it at all?
   _____ Decrease
   _____ Stay the same
   _____ Increase
   _____ Don't know

3) How important to you is the change in the size of the elk population that you indicated in Question 1 above? *(Circle One)*

Not Important	Slightly Important	Important	Very Important	Don't Know

4) How would you like the number of bull elk in DAU E-19 to change, if at all?
   _____ Decrease
   _____ Stay the same
   _____ Increase
   _____ Don't know

5) The objective for bull elk is currently 35 bulls: 100 cows. How would you like the **objective** for the number of bull elk in DAU E-19 to change, if at all?
   _____ Decrease
   _____ Stay the same
   _____ Increase
   _____ Don't know

6) Is it more important to you to hunt every year or to harvest a trophy animal in DAU E-19?
   _____ More important to hunt every year
   _____ Equally important
   _____ More important to harvest a trophy animal

PEOPLE AND ELK

1) Please indicate how concerned you are about each of the following in DAU E-19. *(Circle one number for each item).*

	No Concern				Very Concerned
A) Elk/Vehicle collisions.....	1	2	3	4	5
B) Economic losses to ranchers/farmers from elk damage to rangeland, crops, or fences.....	1	2	3	4	5
C) Damage to homeowners' trees, shrubs, and gardens caused by elk.....	1	2	3	4	5
D) Predation on the elk population by coyotes, bears and mountain lions.....	1	2	3	4	5
E) Loss of elk habitat due to increased human population & development.....	1	2	3	4	5
F) Potential starvation of elk during the winter.....	1	2	3	4	5
G) Elk spreading disease to pets, livestock, or humans.....	1	2	3	4	5
H) Elk competing with livestock for forage.....	1	2	3	4	5
I) Potential competition between elk and deer for habitat.....	1	2	3	4	5
J) Revenue that elk hunting provides local business.	1	2	3	4	5

2) Have you been personally affected by any of the concerns listed in Question 2 in DAU E-19?
_____ Yes If yes, circle one: A B C D E F G H I or J
_____ No

3) How do you personally feel about elk in DAU E-19? **(Check ONE)**
_____ I do not enjoy the presence of elk in DAU E-19, AND regard them as a nuisance.
_____ I enjoy the presence of elk in DAU E-19, BUT worry about the problems they may cause.
_____ I enjoy the presence of elk DAU E-19, AND do not worry about the problems they may cause.
_____ I have no particular feelings about elk in DAU E-19.

ELK HUNTING

1) Have you ever hunted elk in Colorado?
_____ Yes If yes, how many years? _____
_____ No

2) Have you ever hunted elk in DAU E-19?
_____ Yes
_____ No

3) Overall, how satisfied have you been with your elk hunting experience(s) in DAU E-19 in the last 5 years? *(Circle ONE)*

Very Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Very Satisfied

4) Overall, to what extent have you felt crowded by other hunters while elk hunting in DAU E-19? *(Circle ONE)*

Extremely Crowded	Moderately Crowded	Slightly Crowded	Not at all Crowded

5) Rank the following items from 1 to 5 in the order that they would most likely improve your elk hunting experience in DAU E-19. (1=most likely to improve, 5=least likely to improve) Do not use any number more than once.
_____ Less hunter crowding
_____ Higher hunter success rate
_____ Less motorized vehicle access
_____ Seeing more mature bulls
_____ Seeing more elk

6) Overall, how would you rate the quality of elk hunting opportunities available in DAU E-19? *(Circle ONE)*

Poor	Fair	Good	Very Good	Excellent	No Opinion

7) Which ONE factor is the MOST important to you when elk hunting in DAU E-19? *(Check ONE)*

_____ Not seeing other hunters
_____ Obtaining game meat
_____ Harvesting a trophy elk

WRITTEN COMMENTS:

Please use the space below for any additional comments you would like to make about elk in DAU E-19 (GMU 40).