

Cimarron Elk Management Plan

DATA ANALYSIS UNIT E-35 GAME MANAGEMENT UNITS 64 & 65

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Prepared by:
Bradley A. Banulis, Terrestrial Biologist
Colorado Division of Wildlife
Montrose Service Center
2300 S Townsend Avenue
Montrose, CO 81401

CIMARRON ELK MANAGEMENT PLAN

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DAU E-35 (Cimarron) EXECUTIVE SUMMARY

GMUs: 64 and 65

Land Ownership: 51% Private, 28% USFS, 18% BLM, 2% State, 1% NPS

Post-hunt Population: Objective 2,900 2005 Estimate 6,238 Recommended 5,000-5,5000

Post-hunt Sex Ratio (Bulls/100 Cows): Objective 20 2005 Observed 25 2005 Modeled 29 Recommended 20-25

Figure I. E-35 Posthunt Population Estimate

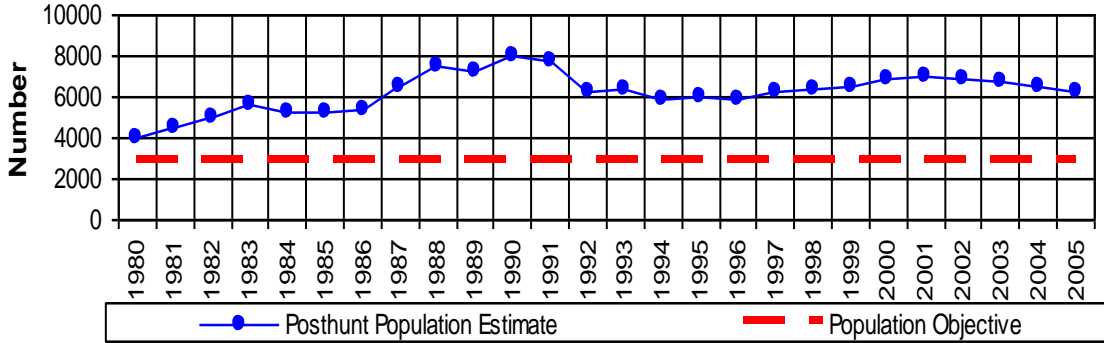


Figure II. E-35 Harvest

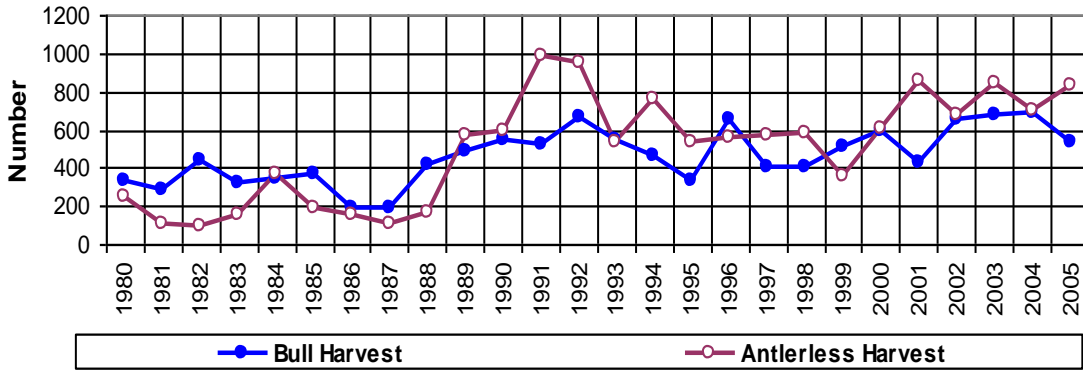
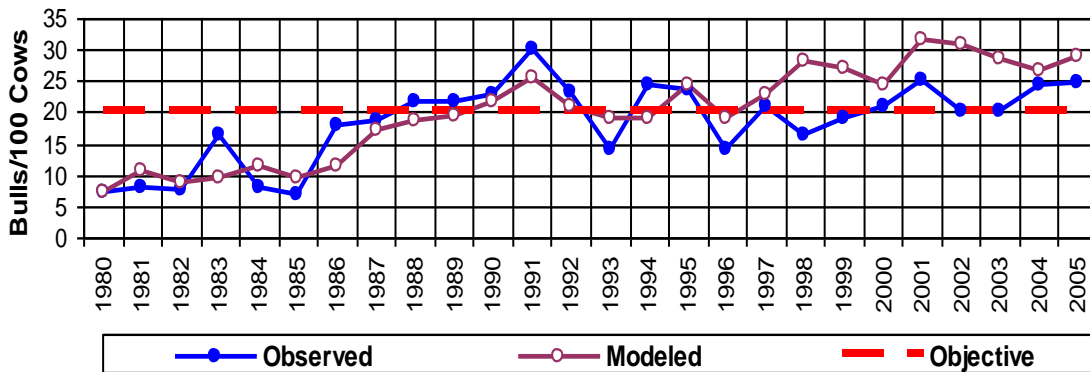


Figure III. E-35 Posthunt Bulls/100 Cows



E-35 Background

Data Analysis Unit (DAU) E-35, the Cimarron elk management area, consists of Game Management Units (GMU) 64 and 65. Units 64 and 65 have historically been managed for hunter opportunity as an unlimited, over-the-counter (OTC) license unit for bull elk hunting. Elk harvest in GMU 65 accounts for at least 80% of the harvest in the DAU based on elk numbers, available habitat, and landownership between the units.

The current post-hunt population objective of 2,900 elk was based on early population models that underestimated the population and is unrealistically low. The current, observed post-hunt sex ratio objective of 20 bulls/100 cows is realistic for an OTC unit, however, higher observed ratios (24.7 bulls/100 cows post-hunt 2005) occur based on irregular hunter harvest due to weather conditions, private land refuges within E-35, and possibly some movement of bulls into the DAU to winter from other units.

From 1980-1990, the estimated post-hunt elk population in E-35 climbed from 4000 elk to almost 8000 elk, before the population dropped down to just over 6200 in 1992 (Figure I). The population remained fairly stable to increasing until it reached a peak just under 7000 in 2001. Since then increased late season antlerless licenses have been made available on public and private land to make an effort to reduce the population towards a more realistic objective of 5000 elk to minimize private land damage issues and winter range quality. The 2005 post-hunt elk population for E-35 was estimated to be 6,200.

The average, observed post-hunt sex ratio for E-35 between 1986 (the first year the 4 point antler restriction was implemented) and 2005 was 21 bulls/100 cows (Fig II). The observed post-hunt sex ratio in 2005 was 24.7 bulls/100 cows.

Observed post-hunt age ratios for E-35 averaged 43.5 calves/100 cows (range 34–57) between 1985 and 2005. The trend in calf:cow ratios in E-35 has generally been downward at a rate of 0.4 calves/100 cows per year possibly indicating density-dependent factors are acting on the population.

E-35 Significant Issues

Habitat capability in E-35 for elk is difficult to assess but declining calf/cow ratios and poor condition of some winter ranges due to drought and overgrazing suggest that habitat capability was probably being approached when elk numbers approached 8,000 animals. Continued development within the DAU and increased recreational use will likely further reduce habitat capability in the future.

Although claims for elk damage in E-35 are not excessive, complaints from landowners and permittees about elk fence/forage damage and elk competition with livestock are not uncommon. These complaints increased some on summer ranges during severe drought years between 2000 and 2002, but are more critical in GMUs 64 and 65 when above average snow fall occurs. The last 5 years have been produced fairly mild

winters, but concerns will increase for game damage whenever winters are more normal.

E-35 Management Alternatives

Three post-hunt population objective alternatives were considered for E-35 (1) 4,500 – 5,000, (2) 5,000 – 5,500, or (3) 5,500-6,000. The local area does not recommend managing for more than 6,000 elk in E-35 because of habitat and private land conflict concerns.

Under current management with OTC bull licenses in E-35, it is not possible to manage for more than 25 bulls/100cows. Any sex ratio objective above 25 bulls/100 cows would require all antlered elk licenses in E-35 to be limited. Management alternatives for E-35 include (1) status quo with E-35 managed as an OTC DAU with a sex ratio objective of 16-20 bulls/100 cows, (2) status quo with E-35 managed as an OTC DAU with a sex ratio objective of 20-25 bulls/100 cows, or (3) making both GMUs limited, quality elk units (the range of possible objectives with this alternative would be 20-30+ bulls/100 cows). The limited alternative would have to be nominated through the public limited unit recommendation process.

The final approved objectives for E-35 are to manage for a post-hunt population of **5,000-5,500 (Alternative 2)** elk with **status quo management** and a **post-hunt sex ratio of 20-25 bulls/100 cows (Alternative 2)**. These alternatives would not change current management, would continue to drive the elk population down to manage habitat and conflict concerns, and should maintain local revenue into the community.

INTRODUCTION AND PURPOSE

The Colorado Division of Wildlife (CDOW) manages wildlife for the use, benefit and enjoyment of the people of the state in accordance with the CDOW's Strategic Plan and mandates from the Wildlife Commission and the Colorado Legislature. Colorado's wildlife resources require careful and increasingly intensive management to accommodate the many and varied public demands and growing impacts from people. To manage the state's big game populations, the CDOW uses a "management by objectives" approach (Figure 1). Big game populations are managed to achieve population and sex ratio objectives established for data analysis units (DAUs). Each DAU generally represents a geographically discrete big game population. The DAU planning process establishes herd objectives that support and accomplish the broader objectives of the CDOW's Strategic Plan.

COLORADO'S BIG GAME MANAGEMENT BY OBJECTIVE PROCESS

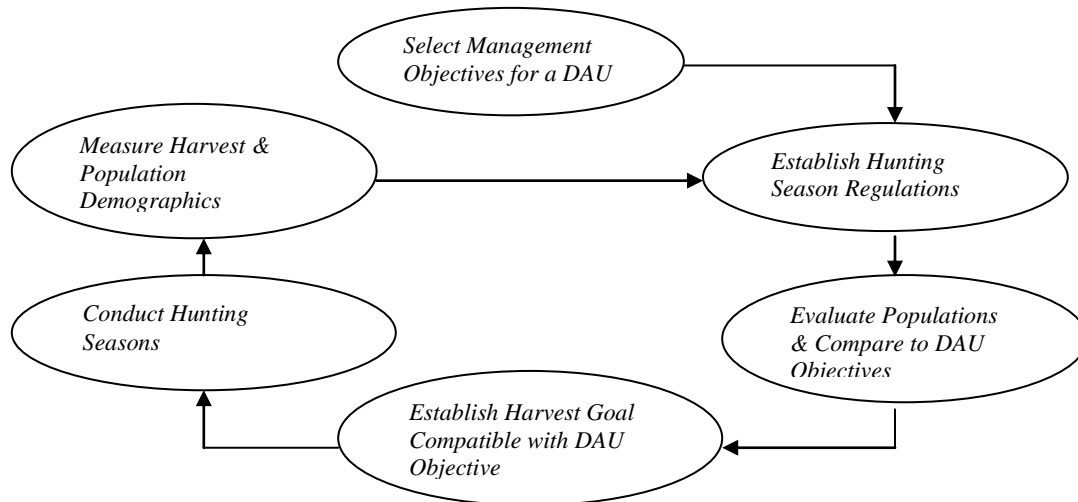


Figure 1. Management by objectives process used by the CDOW to manage big game populations on a DAU basis.

The DAU planning process incorporates public input, habitat capabilities, and herd considerations into management objectives for each of Colorado's big game herds. The general public, sportsmen, federal land management agencies, landowners, and agricultural interests are involved in determining DAU plan objectives through questionnaires, public meetings, comments on draft plans, and input to the Colorado Wildlife Commission. Limited license numbers and season recommendations result from this process.

Each DAU is managed to meet herd objectives that are established through the DAU planning process. The DAU plan establishes post-hunt herd objectives for the size and structure of the population. Once the Wildlife Commission has approved DAU objectives, they are compared with modeled population estimates. Model inputs include:

- Harvest estimates determined by hunter surveys
 - Post-hunt sex and age ratios determined by aerial counts
 - Estimated wounding loss, illegal kill, and survival rates based on field observations and telemetry studies.

A computer model calculates the population's size and structure based on the most accurate information available at the time. The final step in the process is to calculate harvest recommendations that will align population estimates with the herd objectives.

DESCRIPTION OF DATA ANALYSIS UNIT E-35

Location

Data Analysis Unit E-35 is 941 square miles in southwestern Colorado and includes parts of Delta, Gunnison, Hinsdale, Montrose, and Ouray Counties (Figure 2). DAU E-35 consists of Game Management Units 64 (269 square miles) and 65 (672 square miles) and includes parts of the Uncompahgre, Gunnison, and Cimarron River drainages. The DAU is bounded on the north and east by Colorado Highway 92, Gunnison River and Morrow Point Reservoir; on the east by Big Blue Creek and Big Blue Creek-Cimarron River Divide; on the south by Ouray-San Juan county line; and on west by Ouray-San Miguel county line, Colorado Highway 62, Colorado Highway 550 and US Highway 50. GMUs 64 and 65 are separated by US Highway 50.

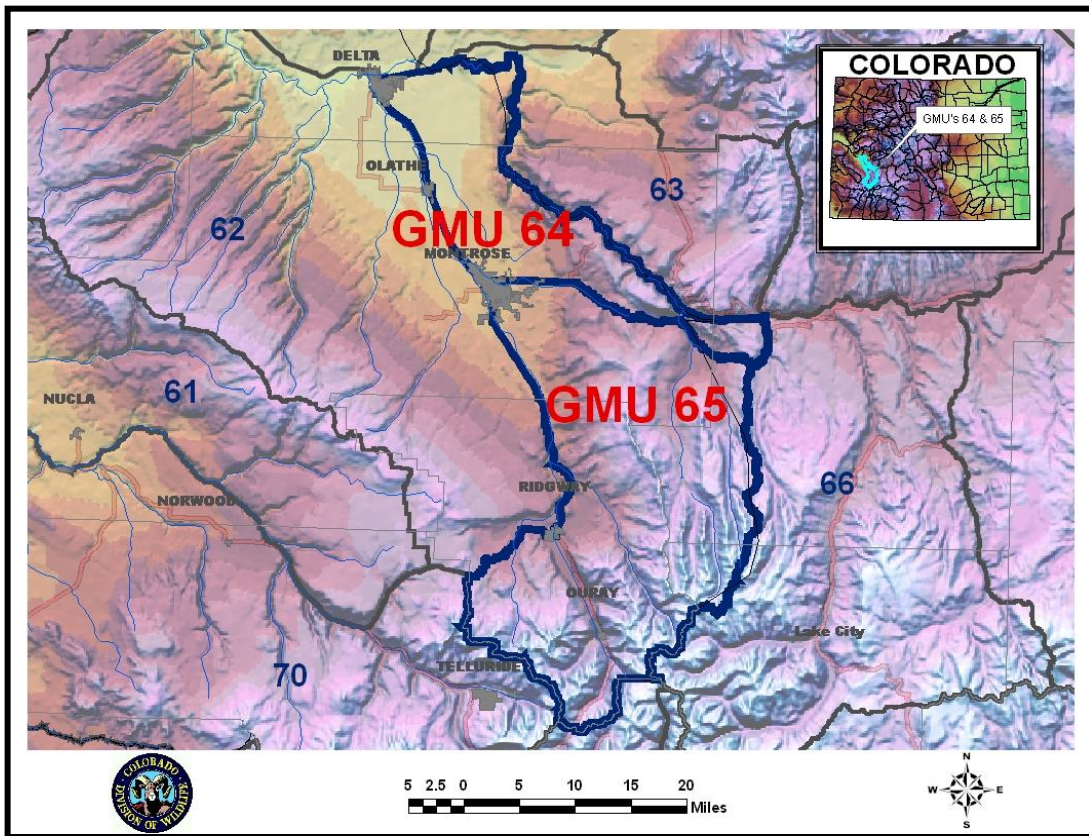


Figure 2. Location of DAU E-35, GMUs 64 & 65, in southwestern Colorado.

Physiography

Elevations within the DAU range from approximately 5,000 ft in Delta to 14,150 at Mount Sneffels. The DAU is very diverse in topography, geology, and climate creating an area suitable to fulfill elk seasonal requirements from winter to summer. The southern portion of the DAU consists of the north side of the San Juan Mountain range and thus providing the headwaters for many creeks including the Dallas Creeks, Cow Creek, and the Uncompahgre River, as well as the Big Cimarron and Little Cimarron Rivers which flow into the Gunnison River. Notable features within the DAU include the Gunnison Gorge and Black Canyon on the Gunnison on the north and eastern boundary of GMU 64, Cimarron Ridge between CO Highway 550 and the Big Cimarron drainage, and the Uncompahgre and Mount Sneffels Wilderness Areas. High elevation habitats abound within the DAU providing abundant summer range for deer and elk, as well as an indigenous Rocky Mountain Bighorn sheep population.

Vegetation

Plant communities are diverse within the DAU, based on the quick changes in elevation from 5,000 ft in the desert shrub communities around Delta to the alpine areas in the northern San Juan range in the south end of the DAU. The high desert plant community is the predominant vegetation type between 5,000 and 6,500 ft near the Uncompahgre and Gunnison Rivers. Important plant species of this community include four-wing saltbush, shadscale saltbush, black sagebrush, winterfat, broom snakeweed, rabbitbrush, and greasewood. Elevations between approximately 6,000-7,500 ft, are characterized by pinyon pine and Utah juniper woodlands and grassland/shrub (e.g., basin big sagebrush, black sagebrush, Wyoming/mountain big sagebrush, mountain mahogany, Indian ricegrass). From approximately 7,500 to 8,500 ft, ponderosa pine/mountain shrub (e.g., Gambel oak, serviceberry, mountain mahogany, mountain big sagebrush, silver sagebrush, snowberry) is the dominant vegetation type. Elevations above 8,500 ft are generally characterized by aspen forests and a mixed spruce-fir complex (aspen, Douglas fir, sub-alpine fir and Engleman spruce). Common plant species found in lowland riparian areas in the Cimarron area include narrowleaf cottonwood, coyote willow, chokecherry, tamarisk, and boxelder. In higher elevation riparian areas characteristic species include thinleaf alder, birches, willows, and blue spruce. Vegetation types within the various bands provide year-round resources for deer and elk.

Agricultural areas and cultivated croplands within the DAU occur primarily in the Uncompahgre Valley from Ridgway to Delta and in the Cimarron River Valley.

Climate

The climate of the Cimarron Ridge/ Northern San Juan area varies depending on season and elevation. Areas below 6,500 ft are usually hot and dry during the summer and generally remain free of snow during most of the winter. Elevations between 6,500-8,000 ft usually have persistent snow only between late November and March. Areas above 8,000 ft can receive heavy snowfall and from December through late April are generally inaccessible except by foot or snow-machine. Many areas of the San Juans will still hold snow into July. Mean annual precipitation varies from less than 8 inches at lower elevations to over 30 inches in the Cimarron and Dallas Creek areas. Snowfall accounts for the majority of the precipitation at the higher elevations. Monsoonal moisture between July and September can also be an important source of precipitation at all elevations.

Land Use

► Ownership

Land ownership in DAU E-35 is 51% private, 28% US Forest Service, 18% Bureau of Land Management, 1% National Park Service, and 2% state. There are also two wilderness areas within the DAU: the Uncompahgre Wilderness (~99,000 acres of USFS and 3,400 acres of BLM) and Mount Sneffels Wilderness (16,500 acres of USFS). Municipalities that border and/or are within the DAU include Montrose, Delta, Olathe, Ridgway, and Ouray.

► Development

The DAU is experiencing a growing human population in the Uncompahgre River Valley that is placing increased demands on E-35 for development and recreation. Approximately 86,680 people live in the five counties that comprise DAU E-35 (Table 1). The human population in these counties increased over 30% between 1990 and 2005 and it is expected to continue increasing at a rapid rate well into the future.

Habitat loss due to development and fragmentation is primarily occurring near the western edge of the DAU from Ridgway to Delta. Relatively little development is occurring on the private lands within the interior parts of the DAU, however, the potential for development is there. Most of these developments are important wintering areas for elk.

Table 1. Human population in the 5 counties that comprise DAU E-35, 1960-2005 (source U.S. Census Bureau).

COUNTY	1960	1970	1980	1990	2000	2005
Delta	15,602	15,286	21,225	20,980	27,834	29,947
Gunnison	5,477	7,578	10,689	10,273	13,956	14,226
Hinsdale	208	202	408	467	790	765
Montrose	18,286	18,366	24,352	24,423	33,432	37,482
Ouray	1,601	1,546	1,925	2,295	3,742	4,260
TOTAL	41,174	42,978	58,599	58,438	79,754	86,680

► **Agriculture**

Agricultural use in E-35 includes cultivated crop production and orchards on irrigated private lands below 6,000 ft in the Uncompahgre Valley and Cimarron area, alfalfa and grass hay production primarily on irrigated private lands below 7,500 ft, and livestock grazing throughout most of the DAU on private and public lands. As a result of extensive water distribution networks, the Uncompahgre Valley has become one of the major crop producing areas on the Western Slope and agriculture contributes greatly to the local economy. Major crops include corn, pinto beans, wheat, onions, and alfalfa. Damage by elk is a major concern in the Uncompahgre Valley if heavy snowfall occurs.

Since the 1880's, livestock grazing has been a mainstay of the Cimarron and Uncompahgre region. Cattle grazing occurs throughout most of E-35 including most of the Uncompahgre National Forest and most BLM lands. Sheep grazing occurs primarily on the public land allotments above timberline. In 2006, there were 10 active cattle grazing allotments with 8,922 AUMs available and 4 active sheep allotments with approximately 1066 AUMs available on the Uncompahgre National Forest in GMU 65. In addition, there were 51 BLM grazing allotments for cattle and 14 grazing allotments for sheep. USFS lands are grazed by cattle primarily between mid-June and mid-September and sheep between July and September. BLM lands are generally grazed by cattle and sheep between October and June, other than a few high mountain allotments that are grazed by sheep in July and August.

From the mid-1930's to the early 1970's, many range improvement projects were undertaken on private, BLM, and USFS lands to benefit livestock. Projects included contour ditching, chaining of pinyon-juniper woodlands, herbicide treatment of sagebrush and Gambel oak, water impoundments, and seeding with non-native species such as crested wheatgrass and intermediate wheatgrass. Deer and elk likely benefited from some of these livestock range improvement programs.

► **Recreation**

The Cimarron and northern San Juan area has long been a popular destination for recreation. Recreation activities include hiking, camping, hunting, fishing, wildlife viewing, photography, mountain biking, horseback riding, four-wheeling, OHV use, snowmobiling, and cross-country skiing. It is believed that recreational traffic is increasing steadily throughout the DAU. The impact of increased non-consumptive recreation activities on elk and other wildlife is largely unknown but is, at some point, assumed to be detrimental because of increased disturbance and habitat degradation.

Hunting impacts to elk are not limited to actual harvest. Hunters have an affect on the distribution of elk in the fall and can affect where elk will winter. Hunters also create new roads that can increase disturbance to elk by a variety of motorized users outside of the hunting seasons. From an economic standpoint, hunting makes the greatest contribution to the local economy of any recreational activity.

► **Mining**

Energy and mining activities in E-35 include mineral mining claims and sand and gravel extraction. Although previous gas exploration has not been productive within the area, there has been an increase in leasing mineral rights within the area. Intensive gold and silver mining activity began in the San Juan Mountains in the 1870's. The area

was very active with mining thru the 1930's before mining went bust in the area. The last large mining operation, the Idarado mine, ended in 1979, now there is still some clean-up taking place at the mine. It is likely that unregulated market hunting and subsistence hunting associated with mining activities in the San Juan Mountains contributed to the elk and deer population decline near the turn of the 20th century. Habitat impacts (i.e., roads, runways, mines, seismic lines, tailings) from this industry are still apparent in Unit 65 south of Ouray with abandoned mine buildings, as well as tailings and high mineral loads in nearby waterways.

► **Timber Harvest**

Timber harvest in the Cimarron consists primarily of fuel wood collection on the Uncompahgre National Forest and private lands. On BLM land, timber harvest consists primarily of pinyon and Gambel oak fuel wood collection and selective cutting of juniper for posts.

The impact of timber harvest on elk is mostly undetermined. Roads created by the timber industry have allowed increased motorized access and possibly greater disturbance to elk. Conversely, elk often prefer timber harvested areas because forage production often increases following silvicultural activities.

HERD MANAGEMENT HISTORY

Post-Hunt Population Size

As a result of unregulated hunting and habitat alterations, only a small number of elk managed to survive in the Cimarron DAU during the early part of the 20th century. In the 1920's, elk were trapped in Routt County, Colorado and released near Ouray to bolster the small local elk population. Elk hunting in the area was prohibited for almost three decades.

By the late 1930's, elk numbers had sufficiently increased to allow limited hunting of bulls. As the elk population continued to increase after WWII, the Cimarron was opened to over-the-counter bull licenses and conservative numbers of limited, antlerless elk licenses. The elk population continued to grow until reaching a maximum estimated post-hunt size of approximately 7,900 elk in 1990.

A post-hunt objective of 2,900 elk for GMUs 64 and 65 was established in 1988, based on previous elk survival data and modeling techniques. The objective is unrealistically low based on current knowledge, but lead to the increase of antlerless and either-sex licenses to a maximum of 2,175 in 1992 to reduce the population. The population remained relatively stable from 1992 to 1997, but then began to increase again causing managers to come up with new ideas to issue licenses and try to get better harvests on the population. By 2001, the population was up to almost 7,000 animals. Currently, the most useful management tool to get harvest on the growing population has been late season antlerless tags on private and public land. The estimated post-hunt population in 2005 was approximately 6,200 and still above objective (Figure 3).

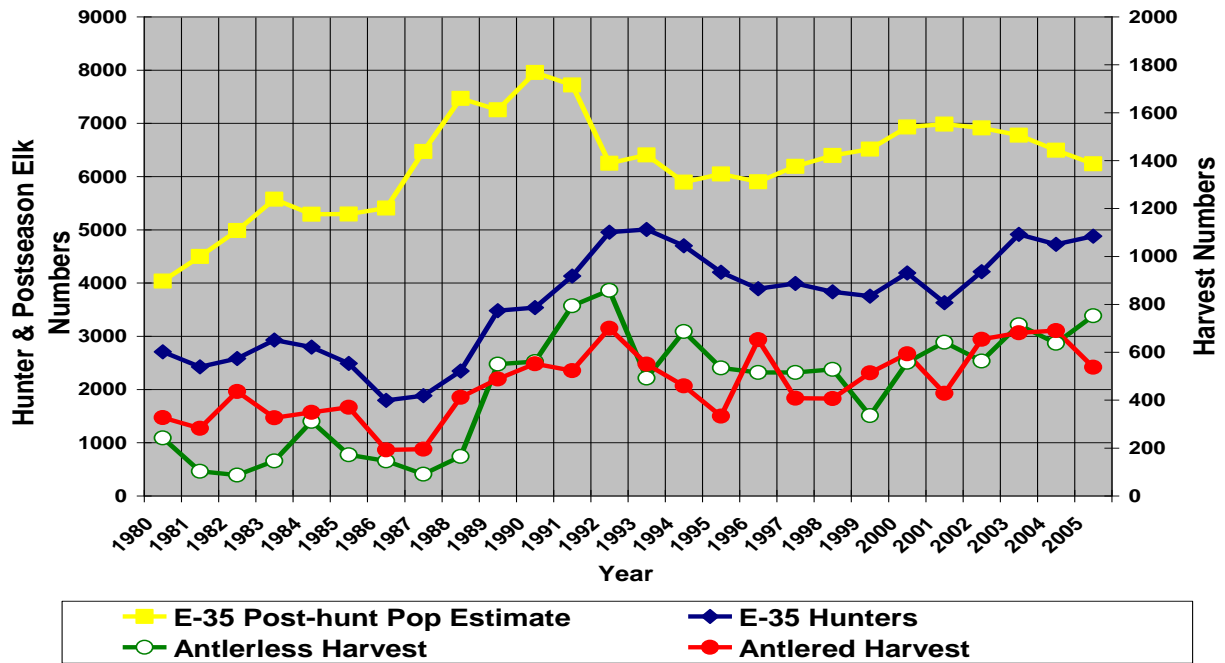


Figure 3. DAU E-35 estimated post-hunt elk population, elk hunters, and antlered and antlerless harvest, 1980-2005. 95% confidence intervals average $\pm 10\%$ for antlered and antlerless elk harvest and $\pm 3\%$ for hunters.

Post-Hunt Herd Composition

Post-hunt herd composition is determined by aerial surveys in late December or early January after the animals have moved to their winter range. It is believed that bull:cow ratios observed in the Cimarron during aerial surveys are biased low because small groups of bulls are more difficult to sight from the air than larger herds of cows and calves. Modeled bull:cow ratios averaged 20% higher than observed bull:cow between 1999 and 2005. Observed post-hunt bull:cow ratios for E-35 averaged 20.5 bulls:100 cows between 1985 and 2005 (range 7.0/100 to 30.2/100) (Figure 4). Since 1989, bull:cow ratios have been slightly higher in GMU 64 versus GMU 65, 23.1 versus 21.4. This difference really is not too significant based on the overall population size within GMU 65, compared to GMU 64. Also, when we conduct our classification flights, some of the animals observed in GMU 64, were probably in GMU 65 during the hunting season. Between 1985 and 2005, on average 71% of the bulls observed in E-35 were yearlings, 14% were 2-year olds, and 16% were 3 years and older. This indicates that we are probably getting a harvest of a diversity of bull age classes, rather than a single, younger age class. The current tentative objective for E-35 is 20 bulls/100 cows, which is realistic and standard for most OTC DAUs, but based on the amount of private land refuge, the bull/cow ratio in E-35 has been above 20 since 1987 with a few exceptions.

Calf:cow ratios observed during aerial counts are generally believed to be non-biased and represent actual ratios. Cow elk do not calve until they are 2 years old and typically produce a single calf. Observed calf:cow ratios for E-35 between 1985 and 2005 averaged 43.5 calves:100cows (range 33.5:100 to 50.1:100) (Figure 4). These ratios are similar to cow:calf ratios observed in many other DAUs in Colorado. The trend in calf:cow ratios in E-35 for the last 20 years has generally been downward at a rate of 0.4calves/100 cows per year. The reason for this decline is unknown but could suggest density-dependent effects acting on the population.

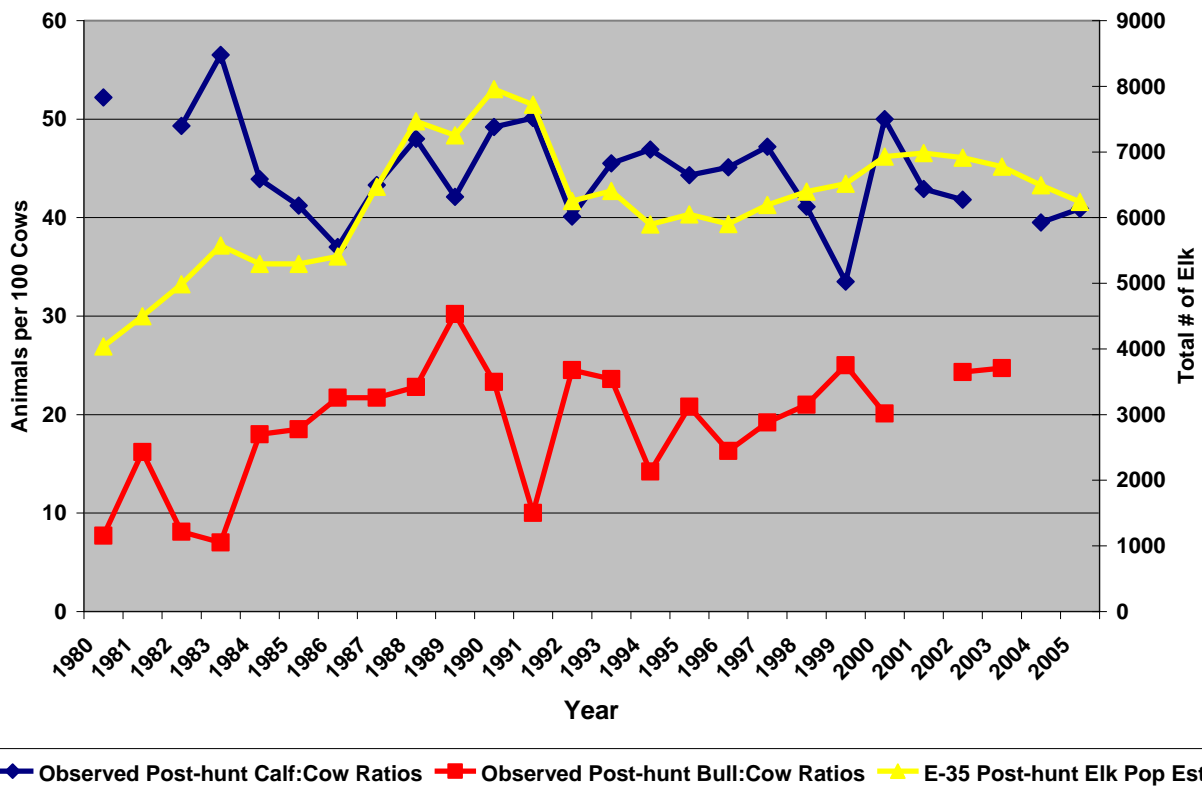


Figure 4. DAU E-35 post-hunt bulls and calves per 100 cows observed during aerial counts, 1980-2005. 95% confidence intervals for E-35 are generally $\pm 25\%$ for the bull:cow ratio and 13% for the calf:cow ratio.

Harvest

► Factors Affecting Harvest

Factors affecting the number of elk harvested each year include: (1) hunting pressure from over-the-counter license holders (i.e., archery either-sex and general rifle bull hunters); (2) the amount of private land with limited hunting; (3) the number of limited licenses issued (i.e., antlerless licenses and 1st and 4th season bull licenses); (4) season structure and antler point restrictions; (5) weather; and (6) population size and structure.

► Harvest History

By the 1930's, elk numbers had grown enough to allow limited bull hunting. By the 1950's, D-35 had been opened up to over-the-counter licenses with a limited number of antlerless elk licenses to manage the growing herd. In addition to managing the growing herd, a four-point antler restriction on bulls was implemented in 1986 to increase the age of bulls within the DAU.

In 1988, a population objective of 2,900 was established, which is currently unrealistic, but realistic at the time based on modeling techniques of elk survival knowledge at the time. In 1992, antlerless and either-sex licenses were increased to 2,175 to reduce the population. By 2000, the post-hunt population estimate was approximately 6,900 and efforts were stepped up to reduce the population with the addition of 1675 cow antlerless and either-sex licenses from the previous year. As of 2005, the post-hunt population estimate was 6,200, and there were 850 either-sex licenses available for the 1st and 4th rifle seasons, 2205 antlerless licenses for the all regular and late rifles seasons, as well as the over-the-counter bull licenses available during the 2nd and 3rd rifle seasons. The licenses available for E-35 in 2005 was the most limited licenses available within the DAU's history and put 4,880 hunters into the field (Figure 5). The late seasons, December general licenses and January PLO licenses, produce the largest harvest of a season within the DAU.

Between 1989 and 2005, elk in E-35 were harvested at an average rate of 15% of the estimated pre-hunt population assuming a 10% wounding loss. The cow harvest rate increased from an average of 5% between 1981 and 1988 to an average of 15% between 1989 and 2005. Just as harvest rates have increased, so have success rates; from 1980-2000 the average success rate 24.7% across the DAU for both antlered and antlerless elk, but in the last 5 years (2001-2005) the success rate has averaged 30%. Figure 5 illustrates how harvest has followed hunter numbers and the total population estimate.

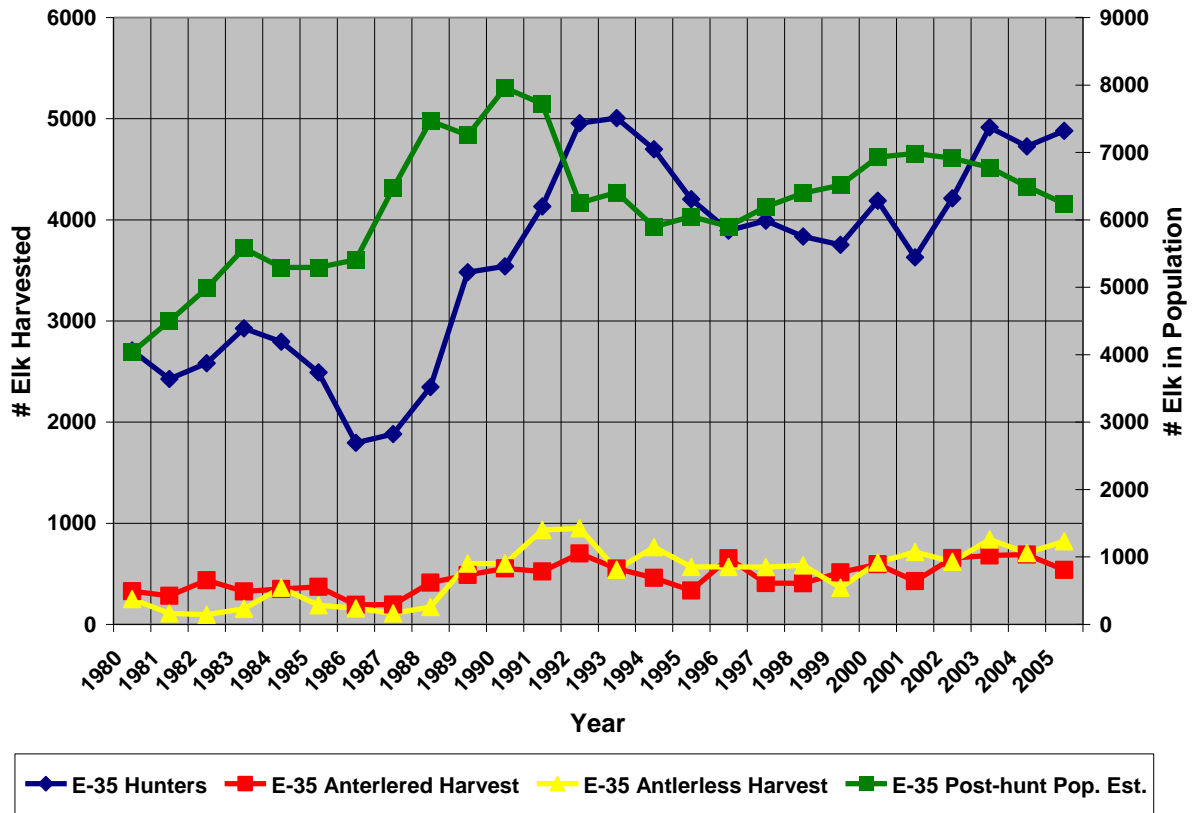


Figure 5. DAU E-35 elk hunters, antlered and antlerless harvest, and post-hunt population estimates, 1980-2005. 95% confidence intervals for E-35 average $\pm 10\%$ for bull and cow harvest estimates .

► Economic Impact

The economic impact of hunting in E-35 includes expenditures by hunters for licenses, lodging, meals, gas, equipment, and services. According to the CDOW’s 2004 report on “The Economic Impact of Hunting, Fishing, and Wildlife Watching in Colorado”, each resident big game hunter in Colorado spend an average of \$35/day of hunting, while each nonresident big game hunter spent an average of \$300/day in Colorado during the 2002 season. Based on an estimated 11,995 recreation days by E-35 resident hunters and 11,482 recreation days by non-resident elk hunters, an estimated \$3.86 million in direct expenses was generated by the Cimarron elk season in 2005. Although data is not available, it is assumed that the majority of these expenditures would have been made in the five counties that comprise E-35. In 2002, the aforementioned report estimated a total of \$20.11 million dollars in direct expenses was spent by elk hunters (not just E-35 hunters) in Delta, Gunnison, Hinsdale, Montrose, and Ouray counties.

CURRENT HERD MANAGEMENT

CURRENT POPULATION OBJECTIVES

The current post-hunt population objective for E-35 is 2,900 elk with an observed bull /cow ratio objective of 30 bulls/100 cows. These provisional objectives have been in effect since 1989.

The 2005 post-hunt elk population for E-35 is estimated at approximately 6,200 based on population modeling. This estimated population is 200% over the current objective. The large discrepancy between the objective and the 2005 population estimate resulted from changes that have been made to the model since 1998. These changes included increasing calf winter survival rates after 1980 from an average of 82% to 86% and increasing the number of age classes in the model to include elk over 15 years of age. These changes were made based on measured calf winter survival rates observed in recent telemetry studies in other parts of Colorado and on age structure studies that showed that cow elk over 15 years of age were common and still reproduced. The increase in the population estimate made the continued high bull harvest observed in the late 1990's mathematically possible. It must be remembered that herd modeling is an evolving process and model estimates can change as new, more accurate information becomes available. Also, it should be emphasized that only the estimate and not the actual number of elk increased. Therefore the current objective of 3,050 was based on a grossly underestimated post-hunt population.

HARVEST MANAGEMENT

▶ Unit 64 versus Unit 65 Management

Elk harvest management in E-35 is focused primarily in GMU 65, based on the larger area, larger herd and greater concern for damage issues. Since 2001, Unit 65 has accounted for almost 80% of the bulls harvested in the DAU and 89% of the antlerless harvest within the DAU.

▶ Regular Season Antlerless Licenses

The CDOW has used a combination of regular season limited licenses, private land only licenses, late season licenses, and damage hunts to attempt to achieve antlerless harvest objectives in E-35. The majority of the antlerless harvest in E-35 occurs during the regular season. Unit 65 accounts for most of the regular season E-35 cow harvest.

▶ Private Land-only Licenses

Private land only (PLO) licenses are used to help achieve antlerless harvest objectives and provide landowners or their designees more opportunity to hunt on their own property. PLO antlerless harvest accounted for 37% of the total antlerless harvest during the 2005 season, exclusive of damage harvest. However, some hunters are reporting that gaining access on private land is becoming more difficult, unless they are willing pay trespass fees.

▶ Late Seasons

Late hunting seasons occur after the regular seasons have closed (i.e., November 16 – February 28). The purpose of late seasons is to increase antlerless harvest and to distribute elk. Late season hunts have occurred in E-35 since 1996. In 2005, the late season accounted for 31% of the total antlerless harvest. The late seasons have proven to be a very effective tool to harvest in E-35, as well as to distribute elk off of private land.

▶ Damage Hunts

Damage hunts are used to reduce confirmed elk damage on specific private properties. Damage hunts are for antlerless animals only and can be held between August 15th– February 28th. The primary purpose of damage hunts is not to achieve DAU harvest objectives but to help alleviate ongoing damage. License applications are given to landowners for distribution. In 2005, only 3 damage hunts with 35 total licenses available resulted in the harvest of 9 antlerless elk in E-35. 2005 was a very mild year with little snow in the high country contributing to the lack of damage activity. However, since 2001, 342 antlerless elk have been harvested in E-35 to manage damage conflicts.

HABITAT RESOURCE

Habitat Distribution

▶ Summer Range

In the spring, most of the elk move to higher elevations following the retreating snowline and green-up. Although some elk remain at low elevations year-round, the majority of the elk in the Cimarron area can be found above 8,000 ft during the summer months. Aspen stands and open parks are especially favored during late spring and summer. Cows often select aspen and oak brush areas in close proximity to dense conifer cover for calving. During the breeding season in September and early October, most elk remain at fairly high elevations and in close proximity to dense cover. Fall hunting pressure begins pushing the elk to lower elevations. By the end of the hunting season in November, large numbers of elk are in the pinyon-juniper and mountain shrub zones below 8,000'.

The quality of summer range is important to ensure elk can recover from winter weight loss, cows can support late fetal growth and subsequent lactation, and bulls and cows will go into the breeding season and winter in good body condition. Herd bulls can lose significant amounts of weight during the rut and cows in poor body condition may not come into estrous.

Summer range is not considered to be a limiting factor for elk in the Cimarron based on the amount of summer range available and the high annual precipitation in the area creating good quality vegetation during most years.

▶ Winter Range

Depending on snowfall, elk may back to higher elevations after the hunting season. The majority of elk in E-35 winter in Unit 65. In normal winters, most of the elk can be found in the Gambel oak/mountain shrub community-type between 7,500-8,500'. There are also areas above 10,000 ft where elk winter along south and west facing slopes that are wind blown. Many branch-antlered bulls will can be found at all elevations in the pinyon-juniper zone during winter regardless of mild conditions.

Winter range is considered to be more critical than summer range because it is much more limited within E-35. The CDOW characterizes winter range into three categories:

- *Winter Range* - that part of the range where 90% of the animals are located during average winters.
- *Winter Concentration Area* – that 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 snowpack and minimum temperatures.

The BLM manages 26%, 23%, and 39% of the elk winter range, winter concentration area, and severe winter range in the DAU, respectively (Table 2). Private property comprises 65%, 64%, and 57% of the elk winter range, winter concentration area, and severe winter range in E-35. Based on aerial classification counts conducted each year in E-35, it is apparent that the large majority of elk, in particularly bull, in E-35 winter on private land. Important wintering areas for elk in Unit 64 include the Bostwick Park area, the Black Canyon National Park, Poverty Mesa, and Fitzpatrick Mesa. In Unit 65, important wintering areas include the Cimarron and Billy Creek State Wildlife Areas, the area between Onion Creek and Cow Creek, and Miller Mesa to West Dallas Creek.

Although radio-collar data are not available, it is believed that there is movement of elk from GMU 65 to GMU 64, across Highway 50, prior to winter. This movement is likely due to differential hunting pressure between the two units and better winter habitat on the south facing slopes in GMU 65.

Table 2. Land ownership of DAU E-35 elk winter range in square miles and percent.

DAU E-35	Total	Winter Range	Winter Concentration Area	Severe Winter Range
BLM	167.5 (17.8%)	81.2 (25.5%)	32 (23.0%)	56.8 (38.7%)
NPS	10.5 (1.1%)	4.1 (1.3%)	0.3 (0.2%)	0.5 (0.3)
USFS	261.0 (27.7%)	11.1 (3.5%)	5.5 (3.9%)	0.5 (0.3%)
State	19.3 (2.1%)	14.7 (4.6%)	12.8 (9.2%)	4.8 (3.2%)
Private	482.8 (51.3%)	207.1 (65.1)	88.5 (63.6%)	84.2 (57.4%)
TOTAL	941.2 (100%)	318.1 (100%)	139.0 (100%)	146.7 (100%)

Habitat Condition and Capability

▶ Habitat Condition

Land health problems in the Cimarron area that have been identified by the BLM and other agencies include accelerated erosion, noxious weed invasion, low levels of perennial grasses, lack of cool season grasses, lack of forbs, low plant species diversity, pinyon and juniper invasion into sagebrush and mountain shrub communities, dominance by late seral vegetation, lack of age-structure diversity, and dense mature shrub communities with low vigor. On the Uncompahgre National Forest land health concerns include conifer invasion into aspen communities, dense mature forest and shrub communities with low productivity, and tree invasion into open parks and meadows.

Other factors that can influence habitat conditions for elk include roads and fences. Numerous studies have shown that elk generally avoid roads and effective habitat capability for elk decreases as road density and road use increases. Fences contribute to elk mortality and can impede movement. In particular, woven-wire fences and improperly constructed worm fences create major obstacles for young calves. These fences are primarily a problem across wintering areas in E-35 based on the amount of private land.

▶ Habitat Capability

There is no easy or accurate way to assess habitat capability (i.e., carrying capacity) for elk on a DAU basis. Current elk numbers have far exceeded carrying capacity expectations from 10-20 years ago. Habitat models such as HABCAP used by the USFS are attempts to estimate habitat capability by using readily available inputs (e.g., forest overstory structure, road density). Although such models can be useful tools for evaluating different management options, they greatly oversimplify very complex systems. Carrying capacity is dynamic and can shift dramatically depending on weather conditions, the arrangement of habitat components, animal distribution, disturbance factors, and multi-species interactions. Body condition and population productivity are probably the best indicators of density-dependent effects and habitat capability. Low reproductive success, high mortality of young, and poor body condition are indicators that a population is at or approaching the capacity of the habitat. No quantitative data are available to assess these indicators for E-35 except post-hunt calf/cow ratios. These ratios show a general downward trend (see page 6) suggesting that density-dependent effects may be acting on the E-35 elk population.

Conflicts

▶ Elk Damage

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 animals provided the landowner allows reasonable hunting access and charges no more than \$100 per hunter. The CDOW also provides stackyards and fencing materials at no charge to qualifying landowners to mitigate big game damage problems.

There have been few elk damage complaints submitted to the CDOW in E-35 in the last decade. Since 1984, eight claims for elk damage in DAU E-35 have been approved for a total of \$4,379. Most damage applicants don't me

requirements based on revenue they generate from outfitting on their land. Although few elk damage claims have been submitted to the CDOW in recent years, many landowners in E-35 have expressed concern about potential and realized elk conflicts when average to above-average snowfall occurs.

In September 1996, the Uncompahgre Habitat Partnership Program (UHPP) was created. The UHPP area includes Game Management Units 64 and 65 as well as 60, 61, 62, and 70. The mission of the UHPP is to identify and solve livestock/big game conflicts that pertain to rangeland forage, growing and harvested hay crops, harvested crop aftermath grazing, and fences on both private and public lands. The UHPP receives 5% of the hunting license revenue generated in the 6 game management units that it encompasses (1998 budget approximately \$140,000; 2,000 budget approximately \$80,000). Projects that have been approved by the UHPP for funding include providing materials to repair fences damaged by elk, roller chopping on public and private lands to improve deer and elk habitat, fertilizing hay meadows to compensate for elk grazing, and noxious weed control. Elk conflicts identified by the UHPP fence damage throughout the DAU, elk competition with cattle for range forage on private and public lands, and elk damage to cured forage. The local HPP committee has recommended a population objective of 4,000-5,000 to support their Habitat Management Plan and a sex ratio objective of 20-24 bulls/100 cows.

In addition to agricultural damage, elk can also cause damage to lawns and ornamental plants in residential areas and other non-agricultural areas such as open space and golf courses. Elk/vehicle accidents, although much less common than deer/vehicle accidents, are another concern.

As a general rule, elk will go where they are least disturbed given adequate food resources. Hunting pressure is the best way to disturb an elk and habitat improvement projects are the best way to actively manage for adequate food resources away from conflict areas.

It should be noted that many landowners in E-35 realize significant economic benefits from elk by leasing hunting rights, guiding elk hunts, and charging hunter trespass fees.

► **Elk Competition With Domestic Livestock**

Some ranchers in the area have expressed concern about elk competition with cattle and sheep on private land and on public lands permitted for livestock grazing. For game damage purposes, the CDOW considers 2.5 elk months to equal 1 AUM. Some livestock producers believe that elk in E-35 are significantly reducing their useable forage yields by grazing spring and summer rangelands prior to cattle. There is also concern that the potential benefits of controlled livestock grazing are not realized when subsequent elk grazing is uncontrolled.

Studies across the west have shown that elk and cattle diets often have moderate to high overlap. However, elk and cattle use is often temporally and spatially segregated. At times elk will graze among cattle but they generally avoid concurrent use. In areas where cattle occur, elk often prefer ridges and steeper slopes, avoid roads, and do more grazing near the edges of openings than cattle. Although elk can compete with livestock, each mouthful taken by an elk is not necessarily a mouthful taken from a cow or sheep.

The point where forage use by elk actually begins to negatively affect livestock production is difficult to determine. Recent studies in Utah have indicated that elk grazing rested pastures can have little effect on forage available to cattle the following year. A study by the CDOW comparing calf weights of cattle grazing pastures with different elk densities failed to show a clear relationship between calf weights and elk numbers but did indicate a small reduction in calf weights at higher elk densities. By artificially penning cattle and elk in the same enclosures, this study obviated any resource partitioning dynamics that might normally occur.

Interactions between elk and livestock can be positive. Elk often show a preference for areas that have been previously grazed by cattle because of the nutritious re-growth. Conversely, elk can help maintain openings and create trails used by livestock.

► Elk Competition With Deer

Potential competition and conflicts between elk and mule deer are largely undetermined. Several studies in the western United States have found that mule deer and elk generally show only moderate diet overlap except during periods of food shortage such as during severe winters. An elk's larger body and rumen size allow it to utilize diets higher in fiber and lower in digestibility than those tolerated by deer. Elk generally prefer to graze on grass, sedges and forbs during much of the year whereas deer often elect to browse during the winter and select forbs, succulent young grass, and new leader growth during the growing season. Deer are not able to utilize high fiber, grass diets as effectively as elk and therefore have a narrower dietary tolerance. Although deer are probably better adapted to browse diets than elk (e.g., deer have tannin binding proteins in their saliva), elk can effectively utilize browse diets when necessary. In periods of food shortage, elk will out-compete deer. During most winters, there is spatial segregation between the majority of elk and deer in the Cimarron DAU. Elk generally winter in the Gambel oak/mountain shrub community types above 7,500' whereas most deer winter in the pinyon-juniper/sagebrush/agricultural interface zone below 7,500'.

Other potential interspecific conflicts between deer and elk such as negative social interactions (e.g., species intolerance, competition for calving and fawning areas) are complex and poorly understood. For example, it has been hypothesized that large numbers of elk might force deer into less preferred habitat where the deer are more susceptible to predation. Casual observation during 3 years of neonatal fawn capture work on the Plateau indicated little evidence that elk are negatively impacting deer during fawning. Elk calving on the Plateau occurs 2-4 weeks prior to fawning and by the peak of fawning elk have already grouped into nursery herds. Deer are often observed in close proximity to elk with no apparent negative interaction.

The mule deer population in the Cimarron has generally been in decline since the early 1980's. Although a causal relationship has never been conclusively established, this decline, as in many other areas of Colorado, coincides with an increase in the number of elk. It is likely that the mule deer decline in the Cimarron DAU and throughout most of the western United States is multi-factorial with habitat loss and fragmentation, decadent and maturing habitats, increased human activity, predation, disease, and elk competition each playing a role.

ISSUES

Issue Solicitation Process

Input for the DAU planning process has been or will be solicited by the following methods: (1) in the fall of 1998, a DAU questionnaire was mailed to affected agencies, organizations, and individuals (i.e., landowners, outfitters, businesses), and distributed in the field during the 1998 big game season and at the CDOW Montrose Service Center (Appendix 1); (2) meetings were held with local USFS and BLM staff to present draft DAU plans and get comments; (3) a public meeting was held in Montrose, central to the DAU, to present the DAU plan and to get opinions on current status of the elk population, as well as opinions of population objectives and sex ratio objectives; (4) a meeting was held with the local HPP committee to present the draft DAU plan and get comments; and (5) a draft of the DAU plan will be available at the Montrose CDOW office, distributed to target individuals, land management agencies, the HPP committee, and organizations for review and comments.

Issue Identification

The primary purpose of the DAU planning process is to determine post-hunt population and male/female ratio objectives for the DAU. A secondary purpose of the process is to gather public input on the best manner to achieve the desired DAU objectives

ALTERNATIVE DEVELOPMENT

POST-HUNT POPULATION & SEX RATIO OBJECTIVES

The estimated post-hunt elk population in E-35 has been estimated as high as 7,900 and as low as 4,500 in the last 25 years. The lowest estimated population number in the last 25 years was in the early 1980's. This DAU has been difficult to maintain at a low population, however, general sentiment is that the population should be lower than current levels due to available habitat, interspecies competition, and game damage. The declining trend in calf:cow ratios in the last decade could indicate that density-dependent effects are already acting on the population.

Sex ratio objectives are depended on desired management for hunting opportunity and quality, as well as desired animal quality. Post-hunt observed bull:cow ratios in DAUs with OTC licenses typically do not exceed 20 bulls:100 cows. E-35 has observed post-hunt sex ratios as low as 7.3 bulls:100 cows in 1980 to as high as 30.2 bulls:100 cows in 1991. Since 2001 the sex ratio has average 23.5 bulls:100 cows and is probably reflective of changes to limited bulls licenses during the 1st and 4th season and limited hunting and pressure on private land in the DAU. Therefore, it is believed that a male/female ratio higher than 20 bulls:100 cows is sustainable within the DAU, while still providing over-the-counter licenses and high opportunity to hunters. If higher sex ratios are desired, opportunity would have to be limited throughout all of the seasons, and management would shift from "maximum opportunity and economic benefits" to management for "improved experience and reduced impacts" or "quality animals and quality experience". Management alternatives and how they affect bull/cow ratio objectives are discussed in the following sections.

POST-HUNT POPULATION OBJECTIVE ALTERNATIVES

Three post-hunt population objective alternatives are being proposed for E-35: **(1) 4,500-5,000**, **(2) 5,000-5,500**, or **(3) 5,500-6,000**. The CDOW does not recommend managing for more than 6,000 elk in E-35 because of habitat and conflict concerns. Conversely, the majority of public comment received on the 1998 E-35 Public Survey and at the 2006 public meeting did not support a major reduction in the number of elk in E-35. Population objectives are being proposed as ranges to provide flexibility on an annual basis as conditions dictate (ie. drought), as well as to recognize that population modeling is evolving as new information and techniques become available.

Setting the population objective for E-35 at **Alternative 1 (4,500-5,000)** would mean we are currently exceeding population objective, would require even greater implantation of numerous antlered and antlerless licenses to meet the population objective, and realistically may not be attainable based on population levels over the last 20 years. Most public comment has indicated a preference for an elk population in E-35 to be similar to current levels, if not higher. However, the local HPP committee has a preference for this alternative to coincide with their Habitat Management Plan.

Alternative 2 would set the population objective at **5,000-5,500**. This alternative would also mean the current population is exceeding objective and requires aggressive harvest to meet the objective. Local CDOW staff does feel this alternative is achievable and would help to minimize habitat quality concerns as well as conflict situations. This alternative shouldn't affect hunting revenue into the local economy too much.

Setting the population objective for E-35 at **5,500-6,000 (Alternative 3)** would mean the current population is almost at the high-end of the objective range and would require little change in current management, other than the potential to reduce the number of antlerless licenses to stabilize the harvest and population number. The lower range of the objective would still allow some flexibility to decrease population numbers as habitat and weather conditions direct.

MANAGEMENT STRATEGIES

There are three basic management strategies the Colorado Division of Wildlife is currently using for elk DAUs. Ideally, all units within a DAU should be managed under the same strategy. E-35 is currently managed via strategy 1 for maximum opportunity and economic benefit.

STRATEGY 1. Management for Maximum Opportunity & Economic Benefits. The current management of E-35 is typical of this strategy which seeks to maximize hunter opportunity and local economic benefits and minimize land-owner conflicts. This management strategy is characterized by large numbers of bull hunters, low hunting success for bulls (i.e., < 20%), and a high annual removal of 2 yr old bulls resulting in an observed post-hunt bull/cow ratio that is usually less than 20 bulls/100 cows. Whereas rifle licenses for antlerless elk are limited and issued in numbers necessary to achieve population objectives, bull licenses during the archery season and the 2nd and 3rd rifle seasons are unlimited in number and sold over-the-counter (OTC).

STRATEGY 2. Management for Improved Experience & Reduced Impacts. This strategy limits the number of hunters for all methods of take for all seasons to reduce hunting pressure and improve the quality of the hunting experience. The primary objective is not to increase bull/cow ratios or have more bulls in older age classes. Moderate numbers of limited bull licenses are issued for all seasons and success rates are typically higher than in OTC units. This management strategy is similar to that in E-25 (Units 66 & 67) and E-51 (Unit 51).

STRATEGY 3. Management for Quality Animals & Quality Experience. This strategy greatly limits the number of bull hunters to achieve a post-hunt bull/cow ratio of at least 30/100. The quality management strategy is characterized by a small number of limited bull licenses, high hunter success for bulls (i.e., ≥ 50%) with a good proportion of harvested bulls three years and older, and usually 5 or more preference points to draw a rifle bull license. The current management of Units 2, 10, and 201 in northwest Colorado and Unit 61 in Southwest Colorado are examples of this category.

MANAGEMENT ALTERNATIVES

Three management alternatives and subsequent sex ratios are being presented for E-35. These alternatives include combinations of Strategies 1,2 and 3 for E-35.

ALTERNATIVE 1. Status quo OTC with a sex ratio of 16-20 bulls:100 cows. This alternative would keep E-35 as an OTC DAU, and would require implanting a greater number of bull licenses during the limited seasons to push the current observed post-hunt sex ratio down to the 16-20 mark. A more aggressive harvest of bulls would be difficult based on the abundance of private land, and would probably exacerbate the issue of pushing more elk, primarily older age classes of bulls, onto private land.

ALTERNATIVE 2. Status quo OTC with a sex ratio of 20-25 bulls:100 cow. This alternative would result in no change from current management. This alternative should provide some diversity of bull age classes in the DAU for harvest by public and private land hunters. This alternative would have little effect of the local economy.

ALTERNATIVE 3. Limit licenses in E-35 (Range of possible objectives would be 20-30+). Alternative 3 would follow management strategy 2 or 3 and limit licenses availability in both GMUs 64 and 65. The management could focus on either improve experience and reduced impacts or quality animals and quality experience. The post-hunt observed bull/cow ratio could be managed for 20+ bulls/100 cows. The number of bull licenses in both units would be greatly decreased to meet objectives. Hunters would most likely have utilize preference points to draw a limited license depending on the degree of limitation on bull licenses, however, success rates would be expected to increase from current levels. Private landowners that charge for elk hunting in E-35 would no longer be guaranteed that specific hunter could get bull licenses. **NOTE: This alternative management plan can only be developed after the unit is nominated by the public to become limited and is accepted by the Wildlife Commission. At that time, specific sex ratios and management strategies could be developed.**

RESULTS OF THE 1998 E-35 SURVEY AND 2006 PUBLIC MEETINGS

In 1998, public comment questionnaires were distributed to obtain public input on the management of D-40 and E-35. Results of the E-35 portion of the survey are shown in Appendix 1. A total of 111 questionnaires were returned (82% resident; 18% non-resident). Seventy-four percent of all respondents desired an increase in the E-35 elk population.

In September of 2006 a public meeting was held in Montrose to collect more recent public input on how elk should be managed in E-35. A total of 9 people attended the meeting. Eighty percent of attendees that responded indicated that they were happy with the current elk numbers, while the general feeling from the other attendees was that they would like to see more elk. In regards to desired population objective, 29% of respondents indicated they would prefer alternative 1 (4,500-5,000), 14% preferred alternative 2 (5,000-5,500), and 57% indicated they would prefer alternative 3 (5,500-6,000). In regards to desired sex ratio objective, 100% of respondents indicated they would prefer alternative 2 (20-25 bulls/100 cows).

CDOW PREFERRED OBJECTIVES & ALTERNATIVES

The CDOW's objectives for E-35, approved by the Wildlife Commission in January 2007 are to manage for a post-hunt population of **5,000 – 5,500 (Alternative 2)** elk with an observed, post-hunt ratio of **20-25 bulls/100 cows** and over-the-counter licenses (**Alternative 2**).

Reasons for selecting *post-hunt population Alternative 2 (5,000-5,500 elk)*:

- Setting the population objective higher could severely impair habitat quality and increase damage issues, while setting the population objective lower would be contrary to most public sentiment.
- Current management appears to be decreasing the elk population and the objective should be attainable in upcoming years.
- This alternative will still provide abundant hunter opportunity.
- The local economy should not be affected too much, as most late season antlerless licenses, which should decrease as the population gets to objective, are mostly resident hunters.
- A population objective range will allow the CDOW to try and manage the elk herd at various levels based on conditions (ie. lower end of range during drought conditions)

The potential negative impacts of selecting *post-hunt population Alternative 2*:

- Based on rate of housing and commercial development, conflict occurrences may increase in future even with a population objective below current population estimates.
- With stable to increasing pressure in the DAU, issues will continue to exist with elk moving to private land where they are not accessible to hunters.
- The objective would be above the local HPP committees recommended population objective of 4,000-5,000.

Reasons for selecting *management Alternative 2 (Status quo OTC, 20-25 bulls:100 cows)*:

- It will allow the CDOW to manage E-35 for opportunity to sportsmen, while sustaining some diversity in bull age classes within the DAU.
- Based on the abundance of private land and limited 1st and 4th rifle seasons, the preferred sex ratio is manageable.
- The public has to nominate GMUs to go limited, so until this happens Alternative 3 is not an option.
- Local economy will not be affected.
- The local HPP committee supports the preferred alternative, even though sex ratios are not identified in their current habitat management plan.

The potential negative impacts of *management Alternative 2*:

- With stable to increasing hunting pressure in the DAU, particularly during the early seasons, issue will continue to exist with elk moving off of public land to private land where they are not as accessible to hunters.
- Success rates will likely not increase based on hunting pressure during the OTC seasons.

Ultimately, the selection of the local CDOW's staff recommendations would not change the current management of the Cimarron elk herd and would provide a middle ground to the variety of constituents interested in E-35.

APPENDIX 1

PUBLIC INPUT QUESTIONNAIRE

DISTRIBUTION & RETURN

In September 1998, a press release providing information about the public comment questionnaire for deer and elk management in Units 64 & 65 was sent to all newspapers in and around Units 64 & 65.

Between September 1998 and November 30, 1998, a sign was posted at the CDOW's Montrose Service Center informing the public of the questionnaire. Questionnaires were available only on request and recipients were asked to identify the group they felt their opinions most represented.

During the 1998 archery, muzzleloader, and three combined rifle seasons, hunters contacted in the field in Units 64 & 65 by CDOW Area 18 officers and the terrestrial biologist were informed about the questionnaire and copies were provided on request. Recipients were asked to identify the group they felt their opinions most represented.

Questionnaires were mailed or delivered to the following groups in October 1998: 1) all landowners in Units 64 & 65 on the Uncompahgre Habitat Partnership Program list; 2) registered outfitters operating in Units 64 & 65; 3) wild meat processors and taxidermist in the surrounding area; 3) locally owned sporting goods businesses in the surrounding area; 4) USFS, BLM, and DPOR employees and local county and municipal governments.

111 questionnaires were returned (Table 3).

Table 3. Distribution and return of E-35 public input questionnaires.

GROUP	RETURNED
Rancher/Farmer	14
Business	4
Landowner	4
Guide/Outfitter	5
Local Government/Government Employee	2
Hunter/Sportsperson	73
Environmental/Conservation Interest	6
Unknown	7
TOTAL	111

RESULTS

Results are presented in the same format as the questionnaire. Results are presented for all 111 respondents.

E-35 PUBLIC INPUT QUESTIONNAIRE RESULTS

Section A. BACKGROUND INFORMATION

A-1. Are you . . . a resident of CO a non-resident of CO
82% 18%

A-2. Do you live in GMUs 64 or 65?

54% No
 46% Yes avg yrs in GMU 64 avg yrs in GMU 65
15 21

A-3. Do you own or lease property in GMUs 64 or 65?

57% No
 43% Yes acres in GMU 64 acres in GMU 65
7,043 27,721

A-4. During the past 12 months, have you participated in outdoor recreational activities other than hunting (e.g. snowmobiling, 4-wheeling, camping, etc) in GMUs 64 or 65?

19% No 81% Yes

A-5. Are you . . . 89% Male 11% Female

A-6. What is your age?

20 or less 21-40 yrs 41-60 yrs 61-80 yrs 80+ yrs
 1% 30% 48% 21% 0%

A-7. Which group(s) do your opinions about deer & elk management in GMUs 64 & 65 most represent? *(Check all that apply)*

Answer to Question A-8 below:

a. 27%	Rancher/Farmer	13%
b. 19%	Business Owner	4%
c. 29%	Landowner	4%
d. 14%	Guide/Outfitter	5%
e. 10%	Government Employee	2%
f. 84%	Hunter/Sportsperson	67%
g. 34%	Environmental/Conservation Interest	5%

A-8. If you checked more than one response in Question A-7 above, write the letter of the one group listed that you MOST represent: **see above**

Section B. PEOPLE & ELK

B-1. Please indicate how interested you are in doing each of the following. (Circle one number for each item). How interested are you in

	No Interest	1	2	3	4	5	Very Interested
Watching or photographing elk?						4.2
Hunting elk in GMUs 64 & 65?						4.5
Seeing elk in GMUs 64 & 65?						4.8
Learning more about elk management in GMUs 64 & 65?						4.3
Providing input for decisions about elk management in GMUs 64 & 65?						4.6

B-2. Please indicate how concerned you are about each of the following in GMUs 64 & 65. (Circle one number for each item). How concerned are you about.....

	No Concern	1	2	3	4	5	Very Concerned	Personally Affected
a. Elk-Auto accidents						2.4	6%
b. Economic losses to ranchers/farmers from elk damage to rangelands/hay/ crops/fences						2.9	15%
c. Damage from elk to homeowners' trees, shrubs & gardens						2.0	6%
d. Predation on the elk population from coyotes, bears and mountain lions						3.8	25%
e. The reduction of elk habitat due to increased human population & development						4.4	33%
f. The potential of starvation of elk during the winter						3.8	15%
g. Elk spreading diseases to livestock, pets or humans						2.4	4%
h. Elk competing with livestock for forage						3.1	16%
i. The revenue that elk hunting or viewing provides for local businesses						2.9	19%

B-3. Have you personally been affected by any of the concerns listed in Question B-2 in GMUs 64 or 65?

<u>No</u>	<u>Yes</u>
38%	62%

(please circle the letter(s) below corresponding to those elk-related concerns from Question 2 that you have personally been affected by in GUMs 64 or 65.)

% of yes answers are listed in Question B-2:

a b c d e f g h i

B-4. How do you personally feel about elk in GMUs 64 & 65? (Check one)

- 0%** I do not enjoy the presence of elk in GMUs 64 & 65 AND regard them as nuisances.
- 34%** I enjoy the presence of elk in GMUs 64 & 65, BUT I worry about problems elk may cause.
- 66%** I enjoy the presence of elk in GMUs 64 & 65, AND I do not worry about problems elk may cause.
- 0%** I have no particular feelings about elk in GMUs 64 & 65.

Section C. ELK MANAGEMENT

C-1. How would you like the elk population in GMUs 64 & 65 change, if at all? (Check one)

- 1%** Decrease greatly (over 50%)
- 3%** Decrease moderately (26-50%)
- 4%** Decrease slightly (1-25%)
- 16%** No change
- 27%** Increase slightly (1-25%)
- 30%** Increase moderately (26-50%)
- 17%** Increase greatly (over 50%)
- 2%** Don't know

All respondents: 8% want decrease, 74% increase

C-2. How important to you is the change in the size of the elk population that you indicated in Question 1 above? (Circle one).

Not	Slightly		Very	Don't
<u>Important</u>	<u>Important</u>	<u>Important</u>	<u>Important</u>	<u>Know</u>
2%	7%	44%	45%	2%

C-3. If you indicated that you would like an **increase in the elk population** in Question C-1 above, what methods would you support or oppose to increase the elk population? *(Circle one number for each item)*

	Strongly Oppose <u>1</u>	Oppose <u>2</u>	No Opinion <u>3</u>	Support <u>4</u>	Strongly Support <u>5</u>
Reduce hunter harvest of cows				2.9
Predator control				4.1
Controlled burning to improve habitat				4.3
Mechanical treatment to improve habitat (e.g. cutting, roller-chopping, chaining)				4.0
Chemical treatment to improve habitat (e.g. herbicide, fertilizer)				3.3
Controlled livestock grazing to improve habitat (holistic management)				4.9
Reduce elk numbers				1.7
Reduce livestock grazing on public lands				3.5
Restrict public access to important elk calving and wintering areas				3.9
Supplemental winter feeding of elk				3.4
Other, please specify:				4.4

C-4. How would you like the number of bull (male) elk in GMUs 64 & 65 to change, if at all? *(Check one)*

- 0%** Decrease greatly (less than 5 bulls/100 cows)
- 1%** Decrease moderately (10 bulls/100 cows)
- 1%** Decrease slightly (15 bulls/100 cows)
- 12%** No change (20bulls /100 cows)
- 25%** Increase slightly (25 bulls/100 cows)
- 33%** Increase moderately (30 bulls/100 cows)
- 26%** Increase greatly (over 35 bulls/100 cows)
- 2%** Don't know

All respondents: 2% want decrease, 84% increase

C-5. If you indicated that you would like an **increase in the bull population** in Question C-4 above, what methods would you support or oppose to increase the bull/cow ratio? *(Circle one number for each item)*

	Strongly Oppose	Oppose	No Opinion	Support	Strongly Support
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Minimum antler-point restrictions (eg., 5 or more points)					3.3
Maximum antler-point restrictions (eg. spikes only)					2.5
Fewer bull licenses					3.6
Shorter bull seasons					2.9
No bull hunting during the rut					3.2
More expensive bull licenses					2.8
Increased cow harvest					3.2
More restricted motorized access during hunting season					3.7
Other, please specify:					4.4

C-6. Which methods would you support or oppose to keep the elk population from exceeding the population objectives? *(Circle one number for each item)*

	Strongly Oppose	Oppose	No Opinion	Support	Strongly Support
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Limited antlerless rifle licenses valid during December for the public					3.5
Limited antlerless rifle licenses valid Sept-Jan for the public					3.1
In addition to regular limited licenses, a limited number of antlerless license applications made available to landowners for their distribution for dispersal hunts outside the regular season structure					3.0
A specified quota of private-land-only either-sex licenses made available for landowners to sell at any price					2.1
Over-the-counter either-sex elk licenses for 2 nd and 3 rd rifle seasons					3.0
Other, please specify					4.2

Section D. ELK HUNTING

D-1. Have you ever hunted elk in Colorado?

8% No (Please go to page 18)
92% Yes How many years? **18.3** years

D-2. Have you ever hunted elk in GMUs 64 or 65?

11% No (Please go to page 18)
89% Yes How many years? in GMU 64? in GMU 65?
Avg. 4.9 **Avg. 11.9**

D-3. Overall, how satisfied or dissatisfied have you been with your past elk hunting experiences in GMUs 64 & 65? (Circle one number for each GMU you have hunted)

	Very <u>Dissatisfied</u>		Slightly <u>Dissatisfied</u>	<u>Neutral</u>	Slightly <u>Satisfied</u>		Very <u>Satisfied</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
GMU 64						3.7
GMU 65						4.5

D-4. Rank the following items from 1 to 5 in the order that they would be most likely to improve your elk hunting experience in GMUs 64 & 65. (1=most likely to improve, 5=least likely to improve) Do not use any number more than once.

<u>GMU 64</u>		<u>GMU 65</u>	
2.5	Less hunter crowding	2.6	Less hunter crowding
4.0	Higher hunter success rate	4.0	Higher hunter success rate
3.3	Less motorized vehicle access	3.5	Less motorized vehicle access
2.3	Seeing more mature bulls	2.3	Seeing more mature bulls
2.9	Seeing more elk	2.9	Seeing more elk

D-5. Would you like to see more or less of the following as they relate to elk hunting in GMUs 64 and 65? (Circle one number for each item)

	Much Less	Less	Same	More	Much More	No Opinion
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
Landowner license preference					2.9
Non-resident elk hunters					2.2
Resident elk hunters					3.1
Temporary road closures during hunting season					3.4
Permanent road closures					3.0

D-6. Overall, how would you rate the quality of elk hunting opportunities available in GMUs 64 & 65? (Circle one number for each GMU you have hunted)

Poor	Fair	Good	Excellent	No Opinion
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>

GMU 64 2.7

GMU 65 2.4

D-7. Currently, an unlimited number of over-the-counter bull licenses are available in GMUs 64 and 65.

If all elk licenses were to become limited in GMUs 64 and 65, elk hunters interested in hunting these GMUs would have to apply for a license through the drawing process in early April each year. Only successful applicants would be allowed to hunt and an applicant might not successfully draw an elk license in GMUs 64 and 65 every year if all elk licenses become limited.

Do you support or oppose a total limitation of elk licenses in GMUs 64 and 65? (Circle one)

Strongly Oppose	Somewhat Oppose	Slightly Oppose	No Opinion	Slightly Support	Somewhat Support	Strongly Support
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>

..... 3.9