BUFFALO PEAKS
ELK MANAGEMENT PLAN

DATA ANALYSIS UNIT E-22

GAME MANAGEMENT UNITS
49, 57, 58

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BUFFALO PEAKS ELK MANAGEMENT PLAN

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DAU E-22 (Buffalo Peaks)
EXECUTIVE SUMMARY
10/10/05

GMUs: 49, 57, and 58
Land Ownership: 41% Private, 27% USFS, 23% BLM, 9% State of Colorado
Posthunt Population: Objective 3,150 2004 Estimate 3,350 Proposed Objective 3,150-3,500
Posthunt Sex Ratio: Objective 35 2004 Observed 17 2004 Modeled 51 Proposed Objective 35-40

Figure 1. E-22 Population Estimate

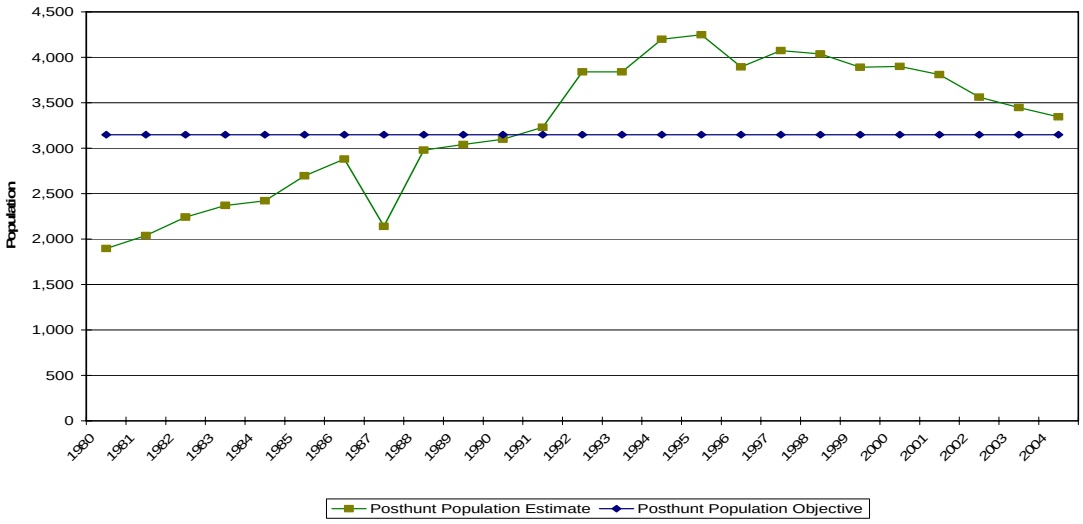
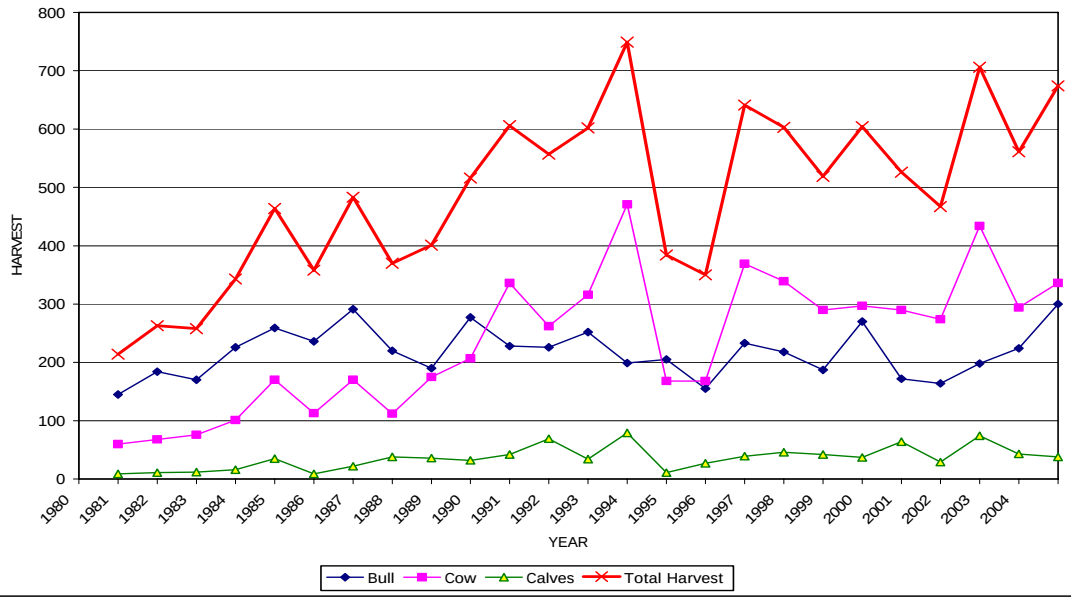
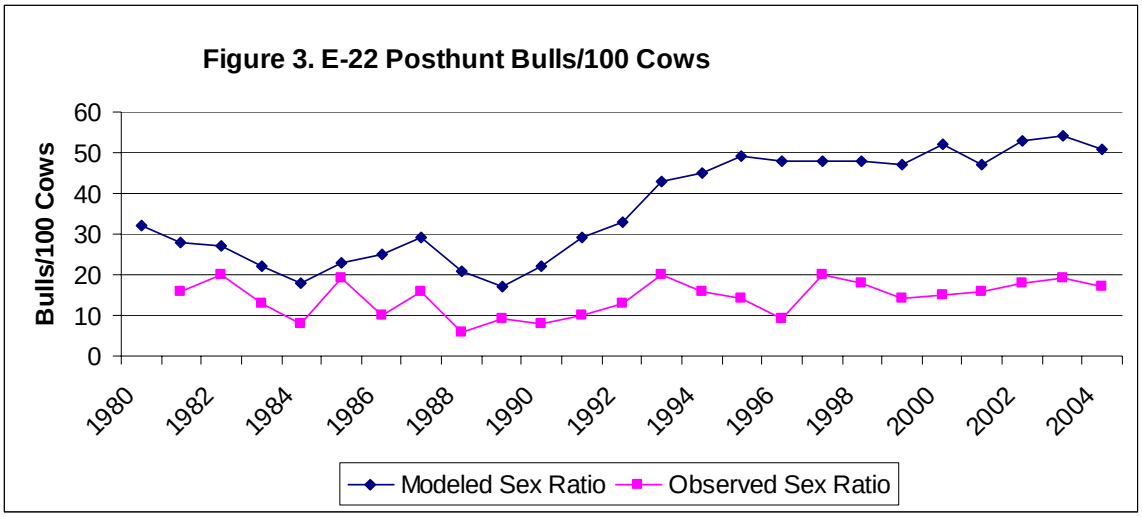


Figure 2. E-22 Harvest





E-22 Background

This DAU has been managed as a quality hunting area since the early 1970s with limited bull licenses. GMU 49 has been a premier hunting unit for many years. GMUs 57 and 58 are traditionally more difficult hunting because of the variety of weather caused movements into and through the units each fall and winter. Snow tends to move elk out of 49 to 57 and eventually into 58. Two late cow seasons in 57 and 58 have been successful in gradually reducing the population to its current level. Three years ago a few landowners requested an extended private land only cow season in those two units and it has successfully aided with conflicts in much of the area. To encourage winter use by elk on the public land portions of unit 57 the two late seasons in unit 57 have been closed and the number of extended PLO licenses has been increased. There is relatively little hay production in this DAU and game damage is much less of a problem than in adjacent DAUs.

This herd has gradually been reduced and is approaching the current population objective. As a result of those efforts, antlerless harvest has exceeded antlered harvest every year but one in the last 15 years. Unit 49 has a steady harvest level while units 57 and 58 are much more variable. Snow fall, or the lack of it, before and during the hunting seasons generally causes this annual fluctuation.

Public comments generally support increasing the elk population objective with 68% of the respondents recommending an increase and 11% wanting a decrease. The two Habitat Partnership Program committees are actively promoting habitat improvements in areas that can support more elk. The goal of this effort is to move as much of the elk use as possible to habitats on public lands where there are no or very limited conflicts. Support for the quality designation and the resultant limitation on numbers of antlered hunters is also

very strong in this DAU with 80% supporting retention of the quality designation. 54% of the respondents to the mail survey strongly support the designation.

Due to the relatively mild winters in most of this DAU, observed bull/cow ratios are very low compared to estimated sex ratios. Bulls are able to winter throughout the area and are difficult to find during counts. Cow/calf groups, on the other hand, often spend the winter in very open areas and are disproportionately represented in age and sex ratio counts. Actual bull/cow ratios are significantly higher than the observed average of 17 though probably not as high as the calculated ratios (51) from the model.

E-22 Management Alternatives

Three population objectives were considered, 1) A 10% reduction from the current objective 2,500 to 2,800; 2) The current alternative 2,800 to 3,150; and 3) A 10% increase 3,150 to 3,500. The recommended alternative is 3,150 to 3,500. The population estimate is currently at this level. The habitat can sustain this population and there is currently very little reported conflict in this DAU. What complaints there are, relate to concentrations of elk in particularly desirable areas while other habitats are underutilized. The HPP habitat improvement projects proposed for the DAU, along with the closure of the two late seasons in GMU 57 will help to redistribute the current elk population into suitable habitats where they will not cause conflicts.

Three sex ratio alternatives were also considered, 1) 25 to 30 bulls per 100 cows; 2) Continue at 35 to 40 bulls per 100 cows; and 3) 45 to 50 bulls per 100 cows. The “quality unit” designation in this DAU requires a minimum of 35 bulls per 100 cows. With the strong hunter satisfaction and support for quality unit designation the recommendation is to continue the 35 to 40 bulls per 100 cows, sex ratio objective.

This DAU plan was approved by the Colorado Wildlife Commission in October, 2005

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 objective" approach (Figure 4). 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

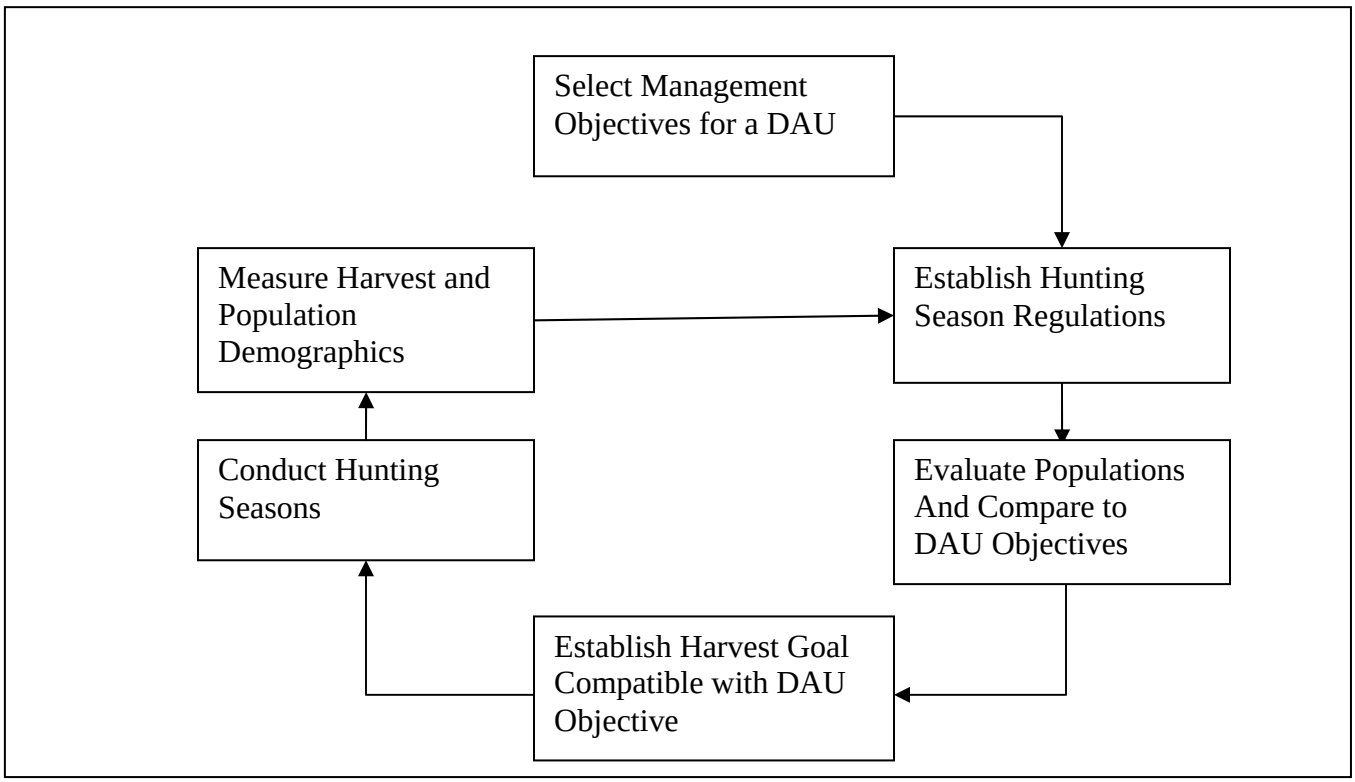


Figure 4. Management by objective process used by the CDOW to manage big game populations on a DAU basis.

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:

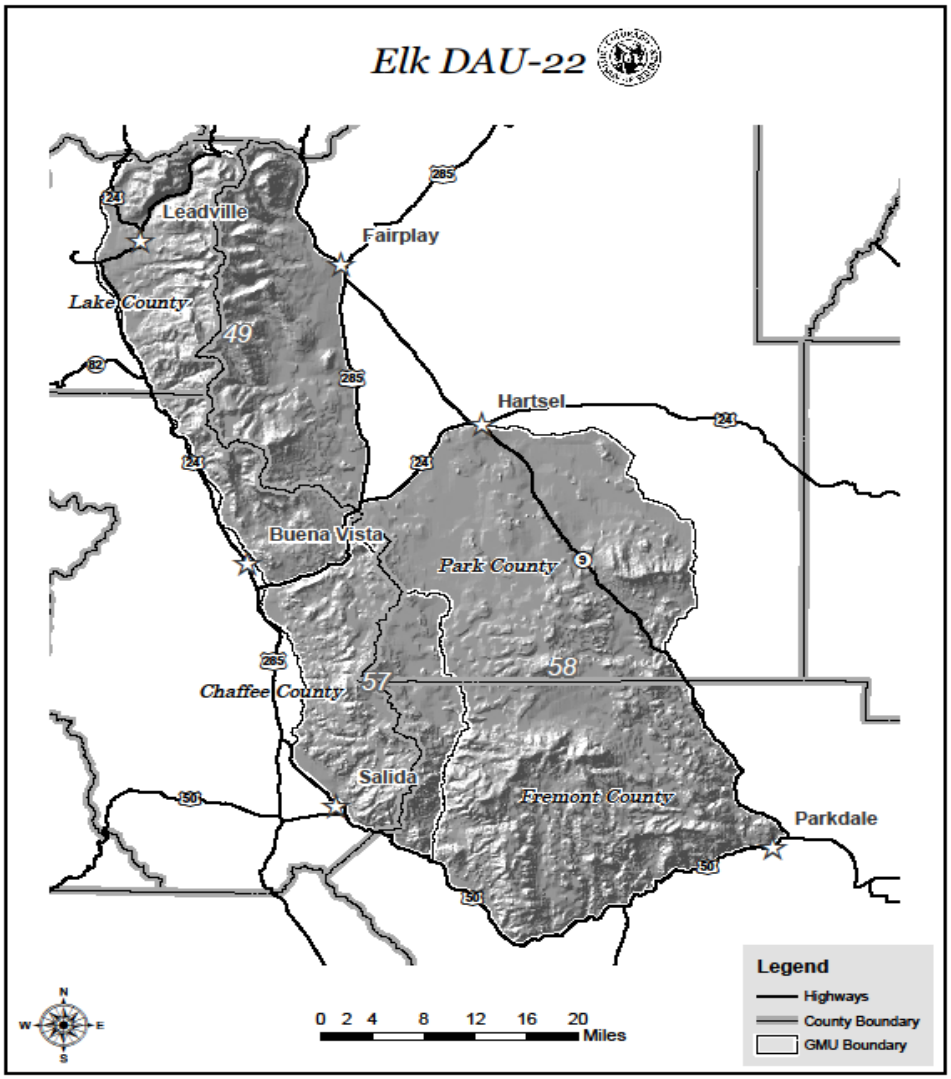
- Harvest estimates determined by hunter surveys
- Post-hunt sex and age ratios determined by counts
- Estimated wounding loss, illegal kill, and survival rates based on field observations and telemetry studies.

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 objective.

Description of Data Analysis Unit E-22

Location

The Buffalo Peaks elk data analysis unit (DAU) encompasses an area of 1,678.6 square miles in central Colorado, approximately 60 miles west of Denver and 40 miles west of Colorado Springs. It includes game management units 49, 57, and 58. The DAU is bounded on the north by the Continental Divide, on the east by Colorado Highway 9, U. S. highways 285 and 24, and Park County road 59, and on the south and west by the Arkansas River. The DAU covers the southwestern one third of Park County, the northwestern quarter of Fremont County and the eastern one third of Lake and Chaffee counties.



Physiography

The area comprises the western and southern edges of South Park, as well as approximately one quarter of South Park itself. The three game management units descend steeply on both sides of the Mosquito Range to the flats of South Park on the east as well as into the bottom of the Arkansas River canyon east and north of Salida. Elevations range from 14,284 at Mount Lincoln, west of Fairplay to 5,720 feet at Parkdale west of the Royal Gorge where the Arkansas River leaves the DAU. The Mosquito Mountain Range runs north to south and comprises the divide between the South Platte River and the Arkansas River drainage.

Vegetation

The western border of the DAU is alpine tundra (above 11,500') and is characterized by sedges, forbs and stunted willows. As the elevation drops, the next ecosystem is subalpine forest (9,000'-11,500') dominated by subalpine fir, Engelmann spruce, aspen and bristlecone pine. The montane forest (5,600'-9,000), contains primarily ponderosa pine, Douglas-fir, lodgepole pine, and aspen. The semidesert shrubland areas (7,000'-8,000'), support sagebrush, rabbitbrush, mountain mahogany, grasses and numerous forbs. The pinon-juniper woodlands (6,800'-8,000'), contain primarily pinon pine, juniper, mountain mahogany, rabbitbrush, forbs and cactus. The riparian ecosystems extend along all of the drainages and include narrowleaf cottonwood, willow, cinquefoil, current and forbs and grasses. The shortgrass prairie of South Park supports grasses and forbs with fringed sage and rabbitbrush creating a low overstory. Agricultural cropland in the DAU is very limited and consists mainly of native grass and a few alfalfa hay fields in the Arkansas River valley bottom and along tributaries. Appendix 2 indicates the acres of each vegetative type found in the DAU and approximate forage production for each type.

Climate

As with all of mountainous Colorado, the climate varies significantly with season, elevation and aspect. Elevations below 7,500 feet are usually hot and dry in the summer and generally remain snowfree during most of the winter. Elevations between 7,500 feet and 9,500 feet have slightly cooler and wetter summers with persistent snow cover on north slopes during the winter. South facing slopes normally remain open or have minimal snow cover throughout the winter. Above 9,500 feet elevation is much cooler and wetter during the summers and north slopes are snowcovered all winter except for windswept ridges above timberline.

Annual precipitation varies from seven inches per year in portions of South Park to over 25 inches at the highest elevations. Snowfall accounts for the majority of the precipitation in the DAU with thunderstorms adding significant localized volumes in the summer.

Average daily high temperatures range from 41 degrees in winter to 82 degrees in summer, in Salida. Average lows range from 12 degrees in winter to 46 degrees in summer. In Leadville and Fairplay, daily high temperatures range from 30 degrees in winter to 67 degrees in summer while daily low temperatures average 0 degrees in the winter and 36 degrees in the summer.

Land Status

The Buffalo Peaks elk DAU encompasses 1, 679 square miles (Figure 5). Private lands total 640 square miles which is 38% of the DAU. The higher elevation portions of the DAU are in the Pike/San Isabel National Forest divided between the Leadville, Salida, Fairplay and San Carlos Ranger Districts. Forest Service lands total 558 square miles and comprise 33% of the DAU. Lower elevation public lands, managed by the Royal Gorge field office of the Bureau of Land Management, are generally scattered between the lower edge of the USFS lands and private lands. BLM lands total 343 square miles which is 20% of the DAU. Occasional parcels of State Trust Lands are dispersed through the private land portion of the DAU totaling 139 square miles (8% of the DAU).

Figure 5. Land ownership within E-22 (square miles, percent of GMU).

GMU	Private	% Private	USFS	% USFS	BLM	% BLM	Colorado	% Colo.
49	139.2	26.0%	328.6	61.5%	45.7	8.6%	18.4	3.4%
57	62.2	22.4%	151	54.5%	46.9	16.9%	17.2	6.2%
58	438.1	50.3%	78.8	9.1%	249.9	28.7%	103.6	11.9%
Total DAU	639.5	38.1%	558.4	33.3%	342.5	20.4%	139.2	8.3%

Land Use

Land use in this DAU has changed significantly in the last 20 years. Multiple uses of the public lands in the DAU include heavy recreational use of both USFS and BLM lands throughout the year. Additionally, most of the public lands have seasonal grazing allotments. There is a small amount of logging, primarily for disease control or salvage timber sales of beetle killed trees or for habitat improvement for deer and elk. Mining has been a significant historic use of public and private lands but has decreased to a very low level of activity at the current time. Private lands are generally in agricultural production, either by livestock grazing or hay production, however, there has been a steady and

accelerating rate of conversion from agricultural status to subdivision for residential development. Much of the important winter range for this elk herd has already been converted or is vulnerable to this change in land use.

Elk Distribution

Elk occupy all of the DAU at some time of the year. Densities are low in the lower elevation habitats year-round but especially during the summer when most elk move up to traditional calving and summering areas in higher elevation habitats. During the winter, most elk move to lower elevation winter ranges as snow accumulates on the higher elevations and north slopes. Because of the relative mild and dry winters, winter ranges often extend to over 10,000 feet in elevation. Some elk will use windswept ridges at higher elevations during the winter. Approximately two thirds of the DAU can and does serve as winter range in normal winters with some concentration occurring in preferred habitats. During severe winter periods, habitat utilization is reduced to approximately one fifth of the size of the overall range (Figure 6).

In recent years an increasing number of elk are remaining in lower elevation habitats that have traditionally been used only by deer. They then seek refuge in new subdivisions which have created de facto refuges where elk can not be hunted.

Figure 6. E-22 habitat categories (square miles).

GMU	Overall Range	Winter Range	Severe Winter Range	Winter Concentration Area
49	536.5	217.5	88.2	14.7
57	247.3	198.1	105.0	12.7
58	714.1	565.7	101.0	137.6
DAU Total	1497.9	981.3	294.2	165.0

Herd Management

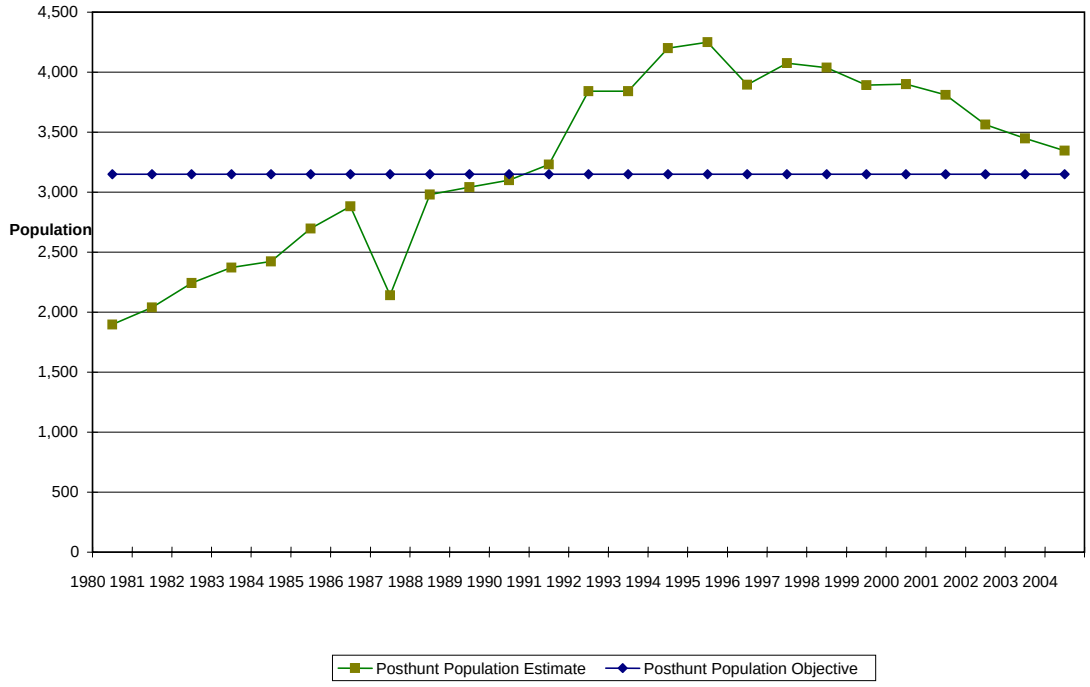
Management of the elk herd in E-17 is conducted like most herds in Colorado. Hunting season regulations and license numbers are set based on the current estimated post-hunt population and the long term population and sex ratio objectives established by the Wildlife Commission in this DAU Plan. Those population objectives are considered to be the most reasonable goal for this herd based on the quantity and quality of available habitat for elk, the recreational, economic and political desires of the people of the state, the level of conflicts

between the elk herd and agricultural producers in the area, and the comments of land management agencies.

The post-season population size is estimated each winter from a computer model utilizing annual harvest data gathered by the Division of Wildlife, age and sex ratio sample counts done by DOW personnel, and population trend estimates based on all of the above data. Estimating numbers of free ranging elk over this large of a geographic area is an extremely difficult and approximate science. Thus the population objectives considered in this plan are designated as ranges to reflect the fact that each year's population estimate may vary according to changes in hunting and counting conditions, survival rates, and winter snow conditions.

E-22 has been a "Specified" management herd with limited antlered elk hunting since 1967 in GMU 58, 1970 in GMU 57 and since 1972 in GMU 49. It was established as a "quality" elk hunting unit when that designation first started. While not impacting the population size, this management regime has kept the bull/cow ratio higher than unlimited bull hunting would have allowed. Additionally, managing the DAU as a quality area has limited hunter crowding during the hunting seasons.

Figure 7. E-22 Population Estimate

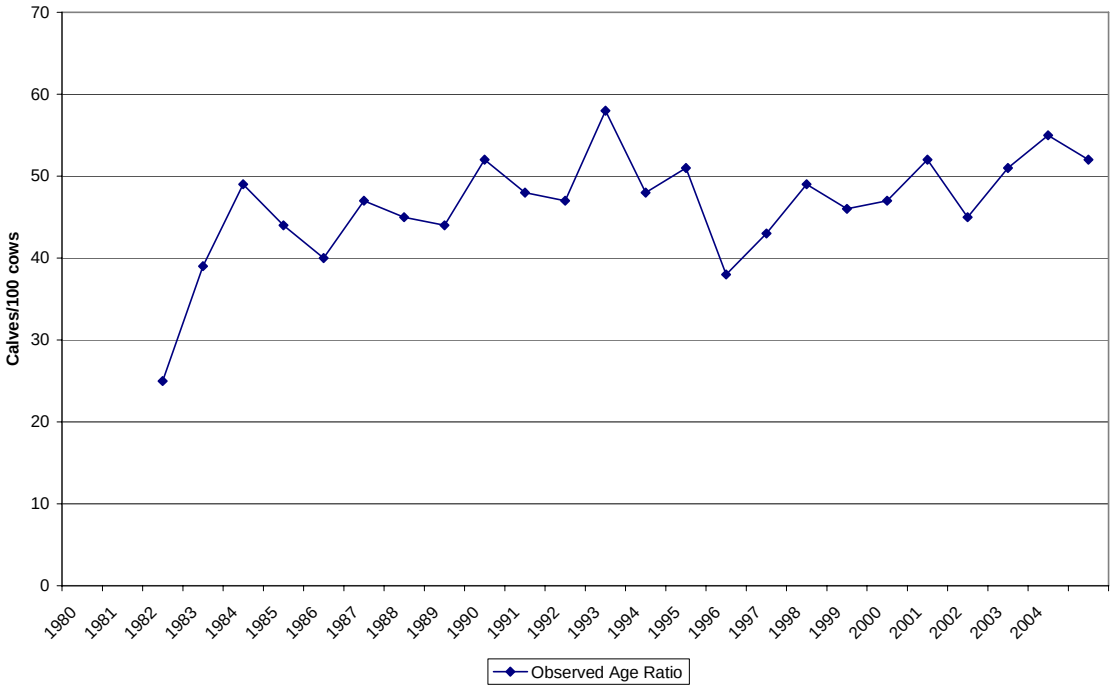


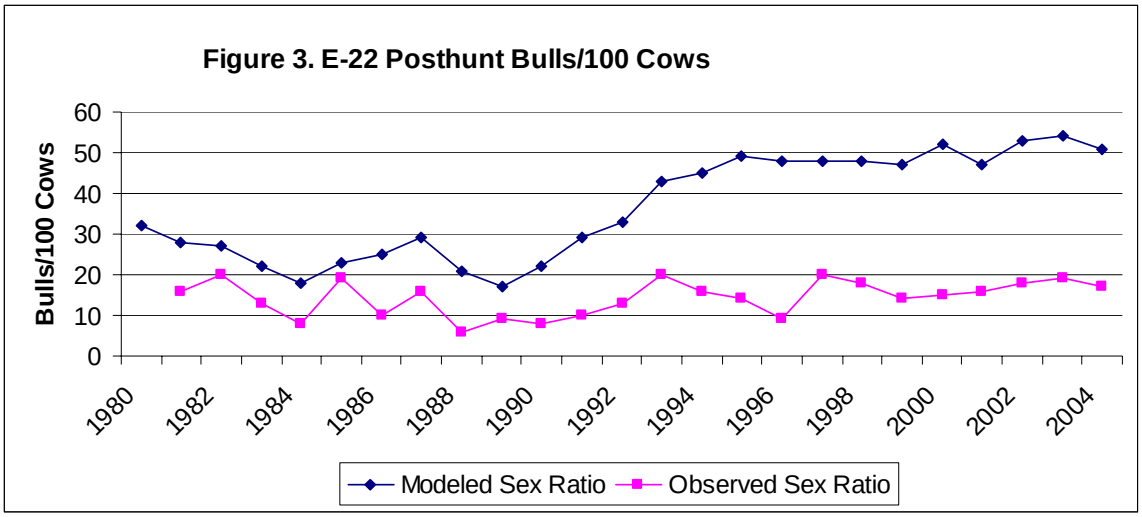
Post Season Herd Composition

Herd composition data has been acquired with a combination of helicopter and ground counts by DOW personnel from the end of November to mid January of each year. Aerial count sample sizes have ranged from 339 elk classified in 2002 to 2,154 classified in 1998, with a ten year average sample size of 1,317 elk classified from 1995 through 2004. Ground classification counts have varied from 238 elk classified in 1991 to 2,282 classified in 2004 with a nine year average sample size of 1,021 elk classified. Ground counts often reclassify groups of animals that have already been classified in previous day's counts. Figure 8 shows the age ratio data from the combined counts.

Sex ratios are obtained in the same combination of aerial and ground counts as age ratios. Both types of counts favor the classification of groups of elk containing cows, calves and younger bulls. Thanks to the limited amount of snow in this DAU and the tendency of mature bulls to winter in heavier cover and at higher altitudes, they are harder to find and are under-represented in classification counts. Observed ratios of bulls, therefore, are much lower than calculated bull/cow ratios. Harvest calculations and population models both suggest the actual ratios are at least in the range of 35 to 45 bulls per 100 cows and may be higher but counts are not able to verify that estimate. Figure 9 shows both the observed and calculated sex ratios for E-22.

Figure 8. Observed Age Ratio, 1981 through 2004





Harvest

Harvest in E-22 has varied through the years, primarily due to weather conditions during the hunting seasons. Total license numbers have increases by more than 150% in the last 15 years as the population approached and exceeded the objective. Antlerless permits have made up the bulk of the increase in the effort to hold the population at the current goal. Figure 10 shows the total harvest with each age and sex component for the last 25 years. Antlerless harvest has exceeded antlered harvest fifteen out of the last seventeen years. As a result, the current population estimate is approaching the current long term objective.

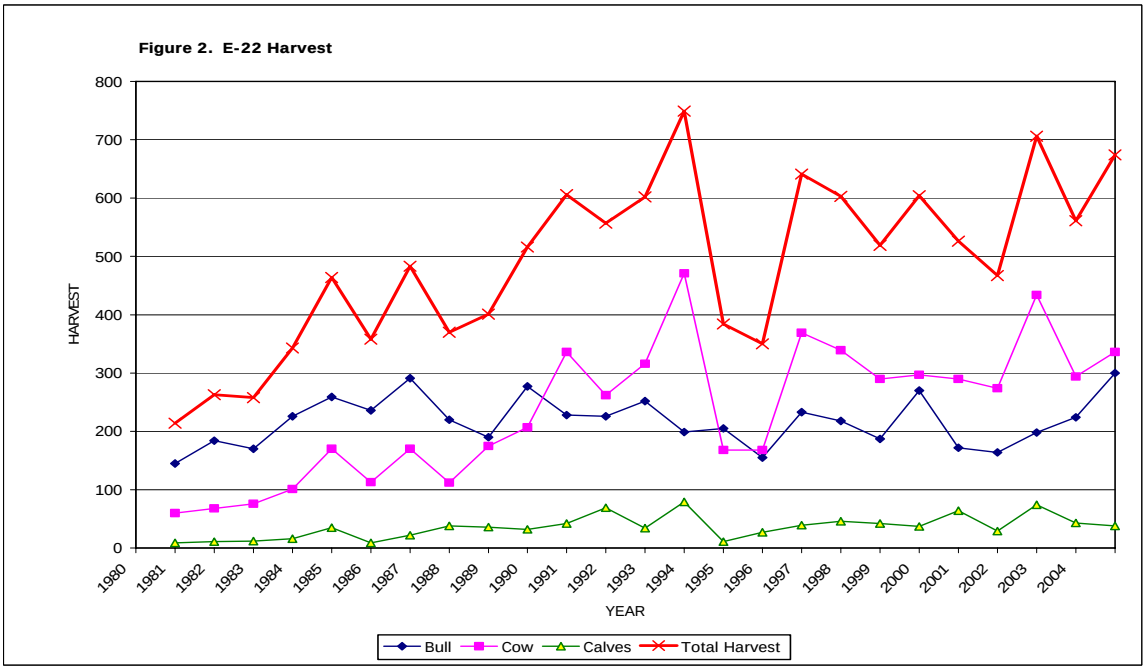
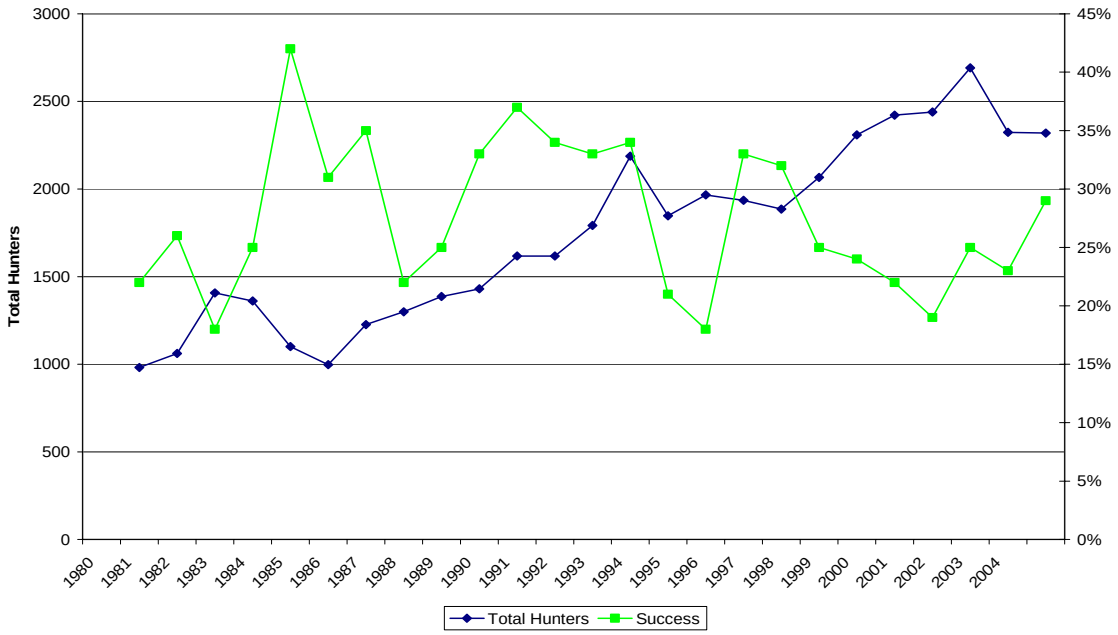


Figure 11 gives the total hunter number and hunter success for the same time period. As the number of licenses has increased, hunter success has decreased. The total harvest has thus leveled out averaging 589 elk per year since 1996.

Figure 11. Total hunters and percent success, 1980 through 2004.



Current Herd Management

The current post-hunt objectives for E-22 are 3,150 for population with a bull/cow ratio of 35. These provisional objectives have been in effect since a draft DAU management plan was developed in 1988.

E-22 has been managed as a quality elk herd for over 30 years. As such, antlered licenses have been limited to provide a less crowded experience for hunters and maintain a sex ratio at or above 35 bulls per 100 cows.

Current Management Problems

E-22 is a large area for the current population. Large portions of the DAU are not utilized by elk most of the year and elk utilization in GMU 57 is well below what the public lands in that unit could support. GMU 49 is mostly public land and supports the largest portion of the elk herd. During the fall and winter, elk move out of 49 and pass through GMU 57 on their way to wintering areas in GMU 58. Large numbers of elk winter on the public, private and state lands around Black Mountain on the southern edge of South Park. Because of this

movement, the hunting seasons were established so that hunters could hunt both GMU 57 and GMU 58 to increase the opportunity to catch elk either as they are moving or after they reach their winter ranges. To increase harvest, two late cow seasons were established and those hunters could also hunt both units. During the last 17 years, efforts to reduce the E-22 population to objective have created heavy hunter pressure on the public lands section of both GMU 57 and 58. As a result of that hunting pressure, elk use of the public lands, especially in GMU 57, has declined dramatically. In an effort to retrain the elk to winter on the public lands in GMU 57, the two late seasons have been closed in 57 starting in 2005. At the same time, the number of permits for the extended private-land-only cow elk season in GMU 57 and 58 has been increased. Hopefully, the combination of the late hunts in GMU 58 and PLO cow licenses in both units will move elk to the public lands in 57.

The Arkansas River Habitat Partnership Program committee is developing a landscape scale habitat improvement project for the public lands in unit 57 that will also attract wintering elk back onto those public lands.

Additional habitat improvement has resulted from the current increase in pine beetle caused mortality in the transitional zone and winter ranges on the east side of GMU 49. The control efforts of the U. S. Forest Service to limit this mortality, as well as the tree mortality itself, has resulted in opening up previously heavily forested areas that are now better able to attract and support wintering elk. The South Park Habitat Partnership Program committee has joined with the USFS in improving additional winter range areas in an effort to attract wintering elk back to public lands from adjacent private lands in GMU 49.

There has been a significant loss of elk habitat due to changes in land use in this DAU. Most of the conversion from agricultural to residential use has occurred in winter and transitional ranges which are critical in determining the carrying capacity of this area. Impacts from development include direct loss of habitat capability as well as the loss of the ability to hunt those lands.

Traditionally, because of the relative small amount of hay production in this DAU, there has been very little game damage conflict. Following the recent drought, when elk use patterns changed in response to reduced amounts of green forage, there has been an increase in complaints about elk use of the few alfalfa and grass hay fields in the DAU. The attractiveness of these fields attracts elk use away from available native ranges. While there is adequate forage to support a larger elk population, the concentration of elk in these conflict areas may become a problem in the future. Hopefully, the early management efforts to redirect elk use patterns, combined with the extended PLO cow hunt, will alleviate those conflicts.

While one long term objective for this DAU is maintaining an elevated sex ratio, there is not an effective way to monitor the actual bull/cow ratios. Thanks to the relative mild climate on the lee side of the Mosquito and Sawatch Mountain Ranges, bull elk are able to spend the winter in areas where they are difficult, if not impossible, to count. For that reason observed sex ratios have ranged from 6 to 20 bulls per 100 cows. Harvest calculations and population models both suggest the actual ratios are at least in the range of 35 to 40 bulls per 100 cows but neither ground nor aerial counts are able to verify that estimate. At this time there is no way to confirm that D-22 is actually meeting that objective however, sex ratios are significantly higher than the observed average of 17, though probably not as high as the calculated ratios (51) from the model.

Much of the South Park area has a high incidence of locoweed which does impact this elk herd. During years with low precipitation in the early spring significant numbers of elk develop symptoms of locoism. The highest documented impact to E-22 was over 200 elk killed in one summer. Normal years result in an average of less than 25 elk killed by this poisonous plant. Due to habitat use patterns by bulls versus cows, there is a greater impact to the male segment of the population. Additionally, some areas have noticed deformed antler development as a result of the alkaloid toxin affecting hormone levels in bulls. While locoism does not present a threat to the population as a whole, it can affect bull survival rates and may impact sex ratios in some years.

Development of Alternatives

Three population alternatives and three sex ratio alternatives were considered for long term objectives for E-22. The population alternatives included: 1) 2,500 to 2,800 elk which is a 10% reduction from the current objective 2) 2,800 to 3,150 which is the current objective with a range below it; and 3) 3,150 to 3,500, a 10% increase from the current objective. Sex ratio alternatives included: 1) 25 to 30 bulls/100 cows; 2) 35 to 40 bulls/100 cows; and 3) 45 to 50 bulls/100 cows.

Two public meetings were held to discuss this plan and the alternatives in 2001 and two meetings in September, 2005. Additionally, a mail survey was sent to sportsmen, landowners and businesses in the area in 2001.

Population Alternative Discussion

1) Decrease the current population objective by 10%, to a range of 2,500 to 2,800 elk.

This objective range would result in a density of 1.7 to 1.8 elk per square mile of overall habitat or 2.5 to 2.8 elk per square mile of winter range.

The increased level of antlerless licenses would continue until the population reaches the lower level. Once the population reached the desired level, licenses for both antlered and antlerless animals would decrease because of the smaller population available to support hunting. Since the current level of damage conflicts results from localized concentrations of elk in attractive habitats, some of which are hay fields, the reduced population objective would have no impact on those complaints. Site specific management will need to be implemented to reduce those complaints no matter which population objective is chosen.

2) Maintain an objective range of 2,800 to 3,150 elk, the top of which is the current objective.

This objective range would result in a density of 1.8 to 2.1 elk per square mile of overall habitat or 2.8 to 3.2 elk per mile of winter range. The current, increased level of cow licenses would continue until the population reached 3,150. There would be more antlerless licenses required than for alternative 1 to maintain the population within the objective range. Like alternative 1, conflicts would not be affected by the choice of this population objective.

3) Increase the current population objective by 10%, to a range of 3,150 to 3,500 elk.

This objective range would result in a density of 2.1 to 2.3 elk per square mile of overall habitat or 3.2 to 3.6 elk per square mile of winter range. E-22 is currently estimated to be at this level. This objective would support more antlered and antlerless licenses than either of the first two alternatives. The current low level of conflicts would also not be affected by the choice of this option. More aggressive use of private-land-only and even distribution hunts, will be needed to reduce elk densities near hay fields. This population level would support more antlered and antlerless licenses and provide more hunting opportunity than the lower two objectives

Sex Ratio Alternative Discussion

1) Reduce the post-hunt objective to 25 to 30 bulls per 100 cows.

This objective range would allow higher numbers of bull licenses and a higher bull harvest. There would be a corresponding increase in hunter crowding and an expected decrease in hunter success and age of bulls harvested with the lower sex ratio objective. This objective would not meet the minimum requirement for a “quality” elk herd.

2) Maintain the current objective at 35 to 40 bulls per 100 cows.

The "quality" designation of this DAU requires a minimum sex ratio of 35 bulls per 100 cows. The DAU would continue to provide high hunter success levels and numbers of mature bulls in the harvest with this sex ratio. This objective will not allow as large of an annual harvest and hunter participation as alternative 1.

3) Increase the post-hunt objective to 45 to 50 bulls per 100 cows.
This objective range would exceed the requirement for a "quality" unit. This range would probably provide higher success levels and more mature bulls in the harvest than the previous two alternatives. However, hunter numbers and recreational opportunity would be more limited. It could be difficult to maintain this sex ratio due to movement of surplus bulls into game management units to the east of the DAU that have lower sex ratios.

Recommended Objectives

The Division of Wildlife recommends the following objectives for E-22:

1) Increase the population objective to 3,150 to 3,500. The current population estimate is currently at this level. Public comments generally support increasing the population objective with 68% of the respondents supporting increase and 11% preferring a decrease. The two Habitat Partnership Program committees involved in E-22 are actively promoting habitat improvements in areas that can support more elk. The goal of this effort is to move as much of the elk use as possible to habitats that can support more use. The average elk density is very low but the challenge will be to move elk concentrations out of attractive areas. The combination of habitat improvements and hunting season changes should accomplish that task and keep conflicts to a minimum.

2) Continue the sex ratio objective at 35 to 40 bulls per 100 cows. E-22 is estimated to be at that level at this time. Support for the "quality" designation and the resultant limitation on antlered elk hunters is very strong (80%) while only 10% of respondents prefer over-the-counter bull licenses.