MOUNT EVANS ELK HERD MANAGEMENT PLAN
DATA ANALYSIS UNIT E-39
GAME MANAGEMENT UNITS 39, 391, 46, and 461

Prepared for:

Colorado Parks and Wildlife

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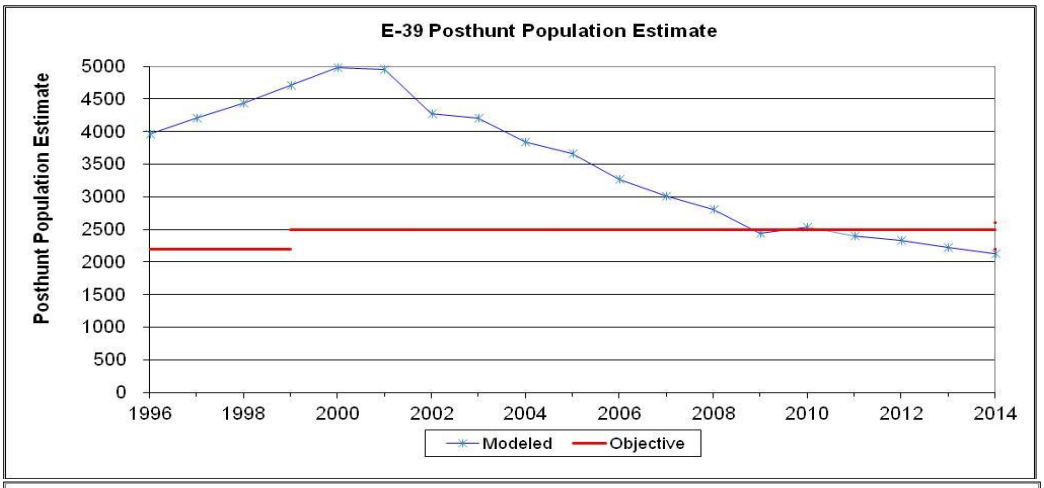
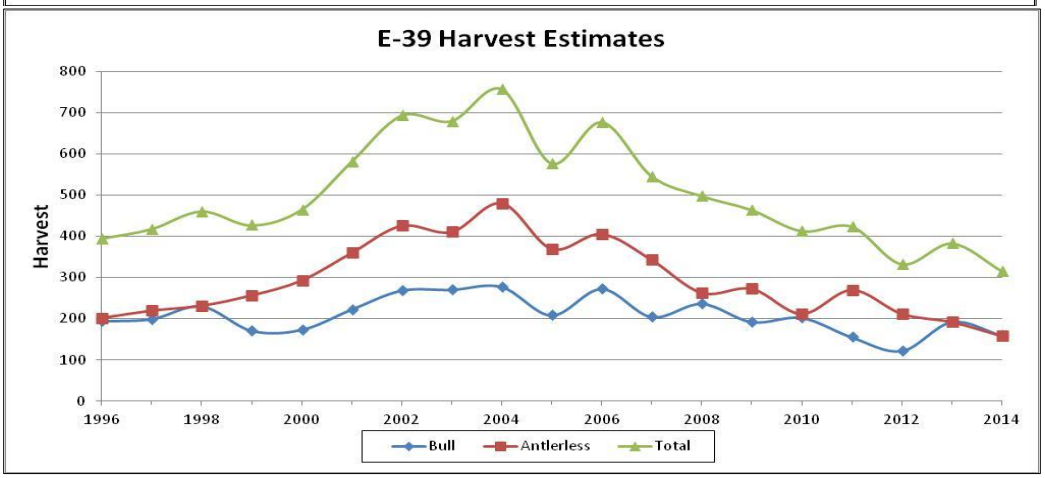
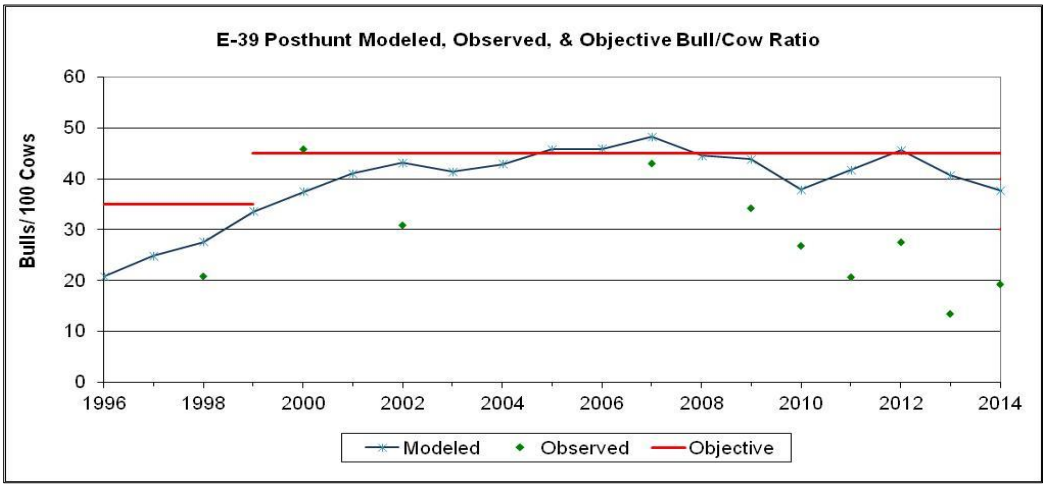
EXECUTIVE SUMMARY – THE MOUNT EVANS ELK HERD, E-39

Game Management Units: 39, 391, 46, & 461
Land Ownership: 51% Private, 38% USFS, 8% Local Government, 1% Nongovernmental Organizations, 1% CPW, <1% State Land Board, <1% Other Federal, & < 1% BLM
Post-hunt Population: Previous Objective 2,500 2014 Model Estimate 2,100
Current Post-hunt Objective Range: 2,200 – 2,600
Post-hunt Sex Ratio: Previous Objective 45 bulls:100 cows 2014 Model Estimate 38 bulls:100 cows
Current Post-hunt Objective Range: 30 - 40 bulls: 100 cows







Background

The Mount Evans elk herd, Data Analysis Unit (DAU) E-39, is composed of game management units (GMU) 39, 391, 46, and 461. It is located in central Colorado in parts of Arapahoe, Clear Creek, Denver, Douglas, Jefferson, and Park counties. Denver and the surrounding metropolitan areas compose the eastern one-third of the DAU. The DAU is approximately 1,003 mi^2, of which, approximately 40% is public land open to hunting.

Population models indicate that the elk herd has been on a declining trajectory since 2002 and below the previous population objective, of 2,500 elk, for the last 4 years. The models also indicate that since 2010, the bull to cow ratio has been on a relatively stable trend of approximately 40 bulls: 100 cows. All licenses are limited, meaning over-the-counter licenses are not available.

Management Issues

Several of the issues that existed during the development of the 1998 herd management plan are relevant today. Loss, degradation, and fragmentation of the habitat of several wildlife species, including elk, due to human population growth and development are still major concerns. Development has occurred throughout the area, but most significantly in the eastern two-thirds of the herd management area, which is primarily private lands. In addition, achieving and maintaining a desirable distribution of elk on the landscape is challenging. Anthropogenic pressures and winter conditions move elk from public land in the western portion of the DAU to refuges in the east. The refuges are created by hunting restrictions on county, city, and private lands. The refuges can lead to high concentrations of elk in subdivisions and open space resulting in increased conflicts. An example is the resident elk herd in Evergreen and the conflicts experienced by home and landowners in the area and the local golf course. According to the public survey, people living in the herd management area are concerned with habitat loss, revenue generated from elk-related tourism, and elk-vehicle collisions. Some people are concerned about elk damage to agriculture production and private residences. However, the majority of residents are not concerned with the current level of elk conflicts experienced by businesses not related to agriculture production. The majority of people would like to see an increase in population size, especially on USFS land and the southern GMUs, and would also like to see bull hunting opportunity maintained or the number of mature bulls on the landscape increased.

Management Alternatives

Post-hunt Population Objective Alternatives

Alternative 1: 1,800 - 2,200

This alternative range is 28% to 12% lower than the previous population objective. This alternative may be the most effective strategy to reduce elk conflicts. However, of the three alternatives, elk harvest, elk hunting opportunities, and elk viewing opportunities would decline the most. Conversely, this alternative may result in increased conflicts through elk using refuges for longer periods of time due to increased hunting pressure. This alternative may not be achieved by hunting alone. Additionally, commerce in the area related to elk hunting and elk viewing would likely decline. This alternative would result in more licenses available in the short term, but fewer licenses available in the long term.

***Alternative 2*: 2,200 – 2,600**

The previous population objective lies within this alternative range. However, the alternative range also encompasses a 12% reduction to a 4% increase from the previous population objective. This alternative will result in elk hunting, elk harvest, elk viewing opportunities, and human-elk conflicts similar the previous population objective.

Commerce in the area related to elk hunting and elk viewing will likely remain stable. This alternative will result in similar license availability in the future.

Alternative 3: 2,600 - 3,000

This alternative range is 4% to 20% higher than the previous population objective. This alternative would provide the greatest elk harvest, elk hunting opportunity, and elk viewing opportunities. However, this alternative may result in the greatest number of elk related conflicts. Commerce in the area related to elk hunting and elk viewing may increase. This alternative would result in fewer licenses available in the short term, but more licenses available in the long term.

Herd Composition – Post-hunt Sex Ratio Objective Alternatives

Alternative 1: 20 - 30 bulls: 100 cows

This alternative range is a 55% to 33% reduction from the previous objective. This alternative would result in the most bull hunting opportunity, but will cause the greatest decrease in both bull harvest success and number of bulls on the landscape. This alternative is least favorable for bull elk viewing; as the fewest mature bulls will be on the landscape. For a given population size, this alternative would result in a more productive elk herd and the greatest number of bull licenses available in the future.

Alternative 2: **30 - 40 bulls: 100 cows**

This alternative range is a 33% to 11% reduction from the previous objective. Compared to the other alternatives, this alternative will result in an intermediate level of bull hunting opportunity, bull viewing opportunity, and number of bulls on the landscape. Commerce in the area related to elk hunting may increase, while commerce related to elk viewing may decrease. For a given population size, this alternative will result in more bull licenses in the short term.

Alternative 3: 40 - 50 bulls: 100 cows

The previous objective is within this alternative range and would result in an 11% reduction to an 11% increase from the previous objective. This alternative is the best strategy to maintain the greatest number of mature bulls on the landscape and elk viewing opportunities. This alternative would likely maintain tourism related to elk viewing, such as viewing rutting behavior in Elk Meadows. The opportunity to draw a bull license in the herd area will be the same, if the population objective remains near the previous objective. However, of the 3 alternatives, this alternative most limits the opportunity to draw a bull license. Commerce in the area related to elk hunting and elk viewing would likely remain stable. For a given population size, this alternative would result in the same number of bull licenses available in the future.

Selected Alternatives

Post-hunt Population Range – Alternative 2, 2,200 – 2,600 elk:

This alternative will result in elk hunting, harvest, viewing opportunities, elk-related commerce, and conflicts similar to what is currently experienced. This alternative was selected because public outreach indicated that the public wants to maintain or slightly increase the current number of elk in the DAU. This alternative is below the biological carrying capacity and it is likely that social factors may limit increases to the population size.

Post-hunt Herd Composition Range – Alternative 2, 30-40 bull: 100 cows:

This alternative was selected because it provides intermediate levels of bull hunting opportunity, bull viewing opportunity, and bulls on the landscape. In addition, there is potential that conflicts related to bulls, especially in residential areas, may be reduced from what is currently experienced.

This herd management plan was approved by the Colorado Parks and Wildlife Commission on 19 March 2016.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION AND PURPOSE

Colorado Parks and Wildlife (CPW) manages wildlife for the use, benefit and enjoyment of the people of the state in accordance with CPW's Strategic Plan and mandates from the Parks and 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 human impacts. To manage big game populations, CPW uses a "Management by Objective" approach (Figure 1).

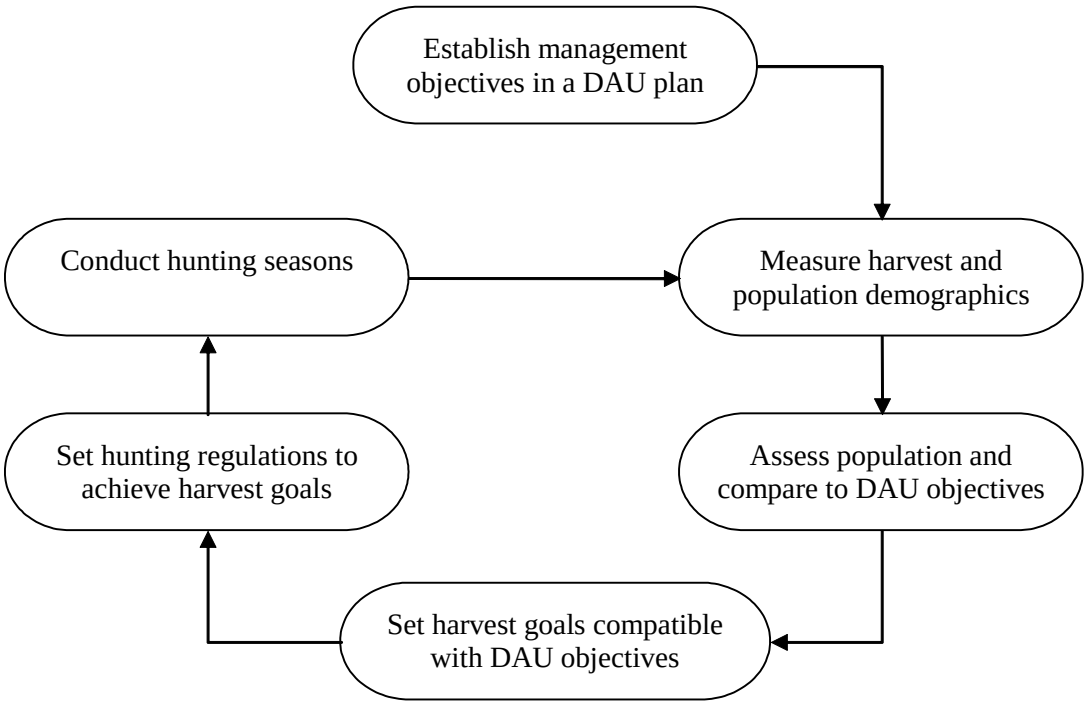


Figure 1: Management by Objective process used by Colorado Parks and Wildlife to manage big game populations by Data Analysis Unit (DAU).

Using this approach, big game populations are managed to achieve herd objectives established for a Data Analysis Unit (DAU), also referred to as a herd management area. A DAU is the geographic area which includes the year-round range of a big game herd. A DAU is the area where the majority of the animals in a herd are born, live, and die. The DAU boundary delineates the seasonal ranges of a specific herd, while minimizing interchange of adjacent herds. A DAU may be divided into several game management units (GMUs) in order to distribute hunters and harvest within the DAU.

Management decisions within a DAU are based on a herd management plan. The primary purpose of a herd management plan is to establish 1) a population size objective range, 2) a herd composition objective range (i.e., the sex ratio or the number of males per 100 females), and 3) population performance metrics for the

herd. There are many factors that are considered when selecting objectives for a particular DAU, including the social and biological carrying capacities of the area, population dynamics, and the concept of maximum sustained yield (Appendix A). Herd management plans also identify limiting factors to the population, conservation efforts, and priority areas.

During the DAU planning process, public input is solicited and collected by way of questionnaires, public meetings, and comments to the Parks and Wildlife Commission in order to select the herd objectives. The intentions of CPW are integrated with the concerns and ideas of various stakeholders including the United States Forest Service (USFS), the Bureau of Land Management (BLM), hunters, guides and outfitters, private landowners, local chambers of commerce, and the general public. In preparing a herd management plan, agency personnel attempt to balance the biological capabilities of the herd and the habitat with the public's demand for wildlife recreational opportunities.

The selection of population and herd composition objectives drive important decisions in the big game season setting process, specifically, how many animals need to be harvested to maintain or move towards the objectives and what types of hunting seasons are required to achieve the harvest objective. The herd management plan describes the strategies and techniques that will be used to achieve the herd objectives. The herd management plan then serves as the basis for the annual herd management cycle. In this cycle, the size and composition of the herd is assessed and compared to the objectives defined in the herd management plan. Hunting seasons are then set and licenses are allocated to either maintain or move toward the objectives. Herd management plans are approved by the Parks and Wildlife Commission and are reviewed and updated approximately every 10 years.

DESCRIPTION OF THE HERD MANAGEMENT AREA

Location

The Mount Evans elk herd, DAU E-39, is located in central Colorado in portions of Arapahoe, Clear Creek, Denver, Douglas, Jefferson, and Park counties. The herd management area consists of GMUs 39, 391, 46, and 461 (Figure 2). The Mount Evans elk herd management area is bounded on north by U.S. 40 and I-70; on east by I-25 and South Platte River; on south by North Fork of the South Platte River and U.S. 285; on west by North Fork of South Platte River and the Continental Divide. Municipalities include Bailey, Bergen Park, Conifer, Denver and surrounding metro areas, Evergreen, Georgetown, Idaho Springs, and Morrison. Major roadways in the area include I-70, U.S. 40, CO 103, CO 74, U.S. 285, and CRs 381 and 62 (Guanella Pass Road). The DAU is approximately 1003 mi^2.

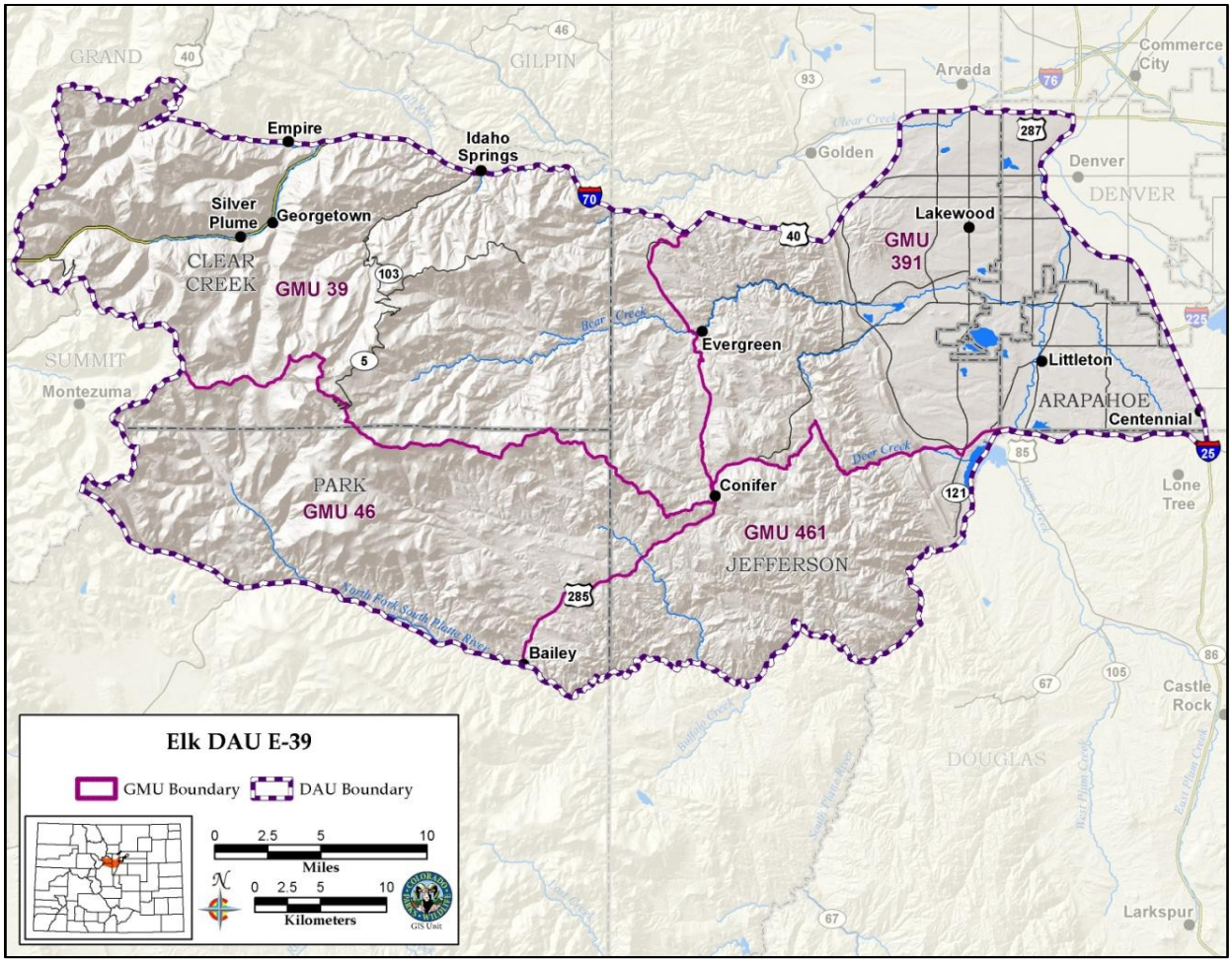


Figure 2: Geographic location of the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, composed of Game Management Units (GMU) 39, 391, 46, and 461.

Topography

This herd management area lies on the Front Range, from the Continental Divide in the west, down to the plains in the east. The west-to-east elevation gradient goes from over 14,000 ft. in the west, down to approximately 5,200 ft. in the east. There are four peaks over 14,000 ft., including the DAU's namesake, Mount Evans. With the exception of the plains and fans ecoregions in the east, E-39 is mountainous and the topography varies greatly (Figure 2).

All drainages flow into the South Platte River watershed. Major drainages include Clear Creek, Bear Creek, Turkey Creek, Deer Creek, and the South Platte River.

Climate and Precipitation

Climate and precipitation vary across the DAU as a function of altitude along the west-to-east elevation gradient. In general, the western portion has comparatively cooler summer temperatures and much colder winters with snow covering timbered areas and north facing slopes from November through May. The eastern portion of the

DAU has comparatively warm summer temperatures and mild winters. Snow often melts within a few days after storms in the eastern portion of the DAU.

The following is a summary of climate trends in the DAU from the alpine in the west to the plains in the east. In the western area of E-39, is Mount Evans (elevation 14,265 ft.). On Mount Evans, the average warmest month is July and the average coolest month is December (Figure 3). Mount Evans has one the lowest average annual temperatures in the lower 48 states (33°F). The highest recorded temperature was 84°F in 1979 (www.weather.com), while temperatures below -40°F have been recorded at the summit. The average annual precipitation is 34 in., with most precipitation occurring in either April or August (Figure 4). The average annual snowfall on Mount Evans is 304 in., with the most snowfall occurring in April (Figure 5). In Evergreen, near the center of the DAU, at 7,200 ft., the warmest month is July, while the coolest month is January (Figure 3). The highest recorded temperature was 97°F in 2012, while the lowest recorded temperature was -38°F in 1963 (www.weather.com). On average, the annual precipitation is 18 in., with the most precipitation occurring in May (Figure 4). The average annual snowfall in Evergreen is 84 in., with the most snowfall occurring in March (Figure 5). In Lakewood, in the eastern area of the DAU at 5,500 ft. in elevation, the warmest month is July, while the coolest month is December (Figure 3). The highest recorded temperature was 104°F in 1994, while the lowest recorded temperature was -26°F in 1963 (www.weather.com). On average, the annual precipitation is 16 in., with the most precipitation occurring in May (Figure 4). The average annual snowfall in Lakewood is 56 in., with the most snowfall occurring in March (Figure 5).

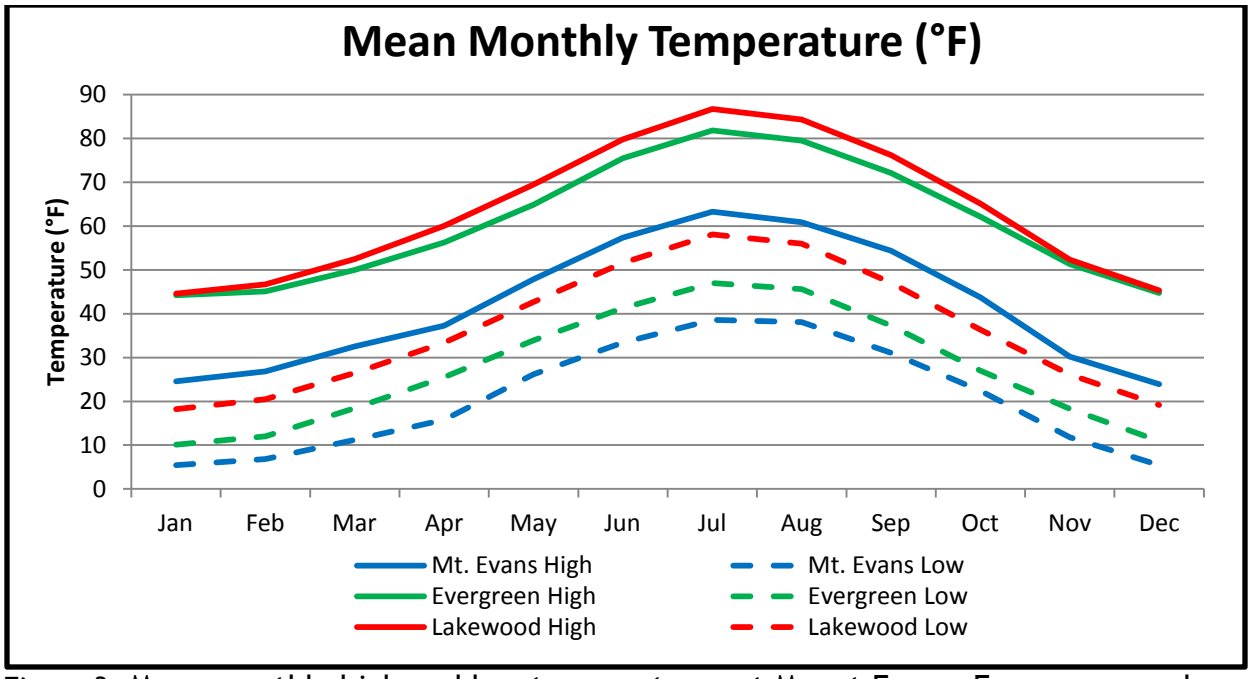


Figure 3: Mean monthly high and low temperatures at Mount Evans, Evergreen, and Lakewood, CO (Colorado Climate Center, http://climate.atmos.colostate.edu/dataaccess.php). Mount Evans data 1983-1999, Evergreen data 1961-2013, and Lakewood data 1962-2010.

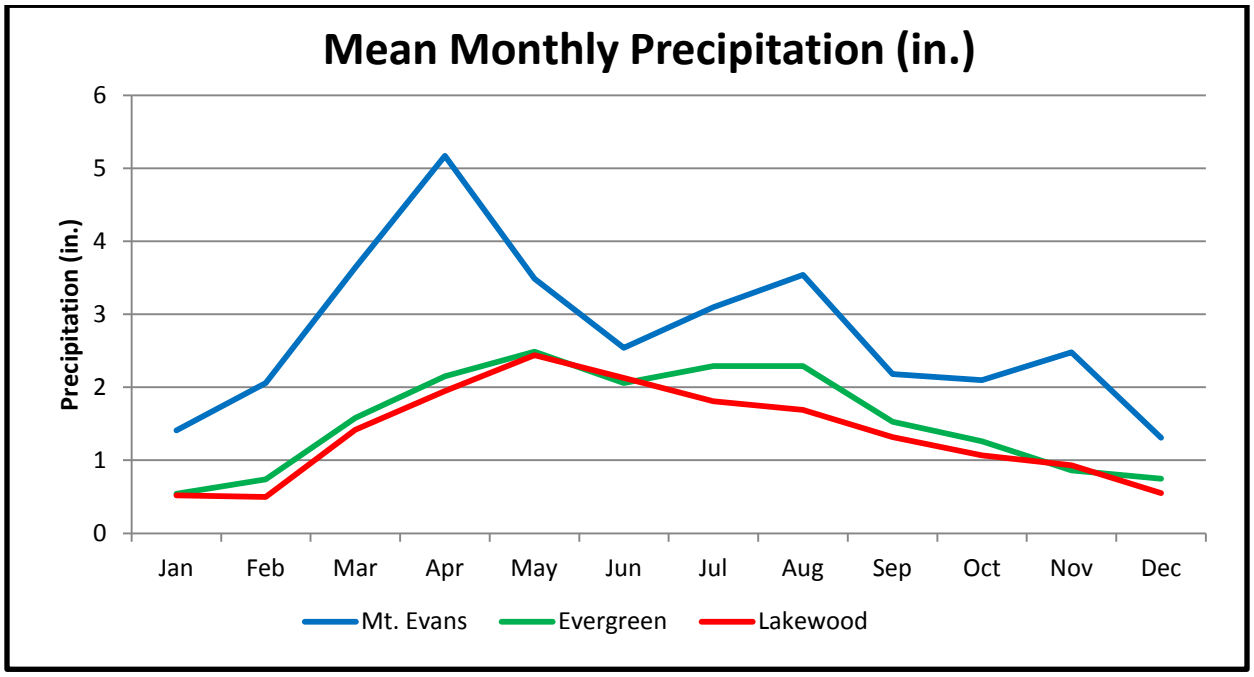


Figure 4: Mean monthly precipitation for Mount Evans, Evergreen, and Lakewood, CO (Colorado Climate Center, http://climate.atmos.colostate.edu/dataaccess.php). Mount Evans data 1983-1999, Evergreen data 1961-2013, and Lakewood data 1962-2010.

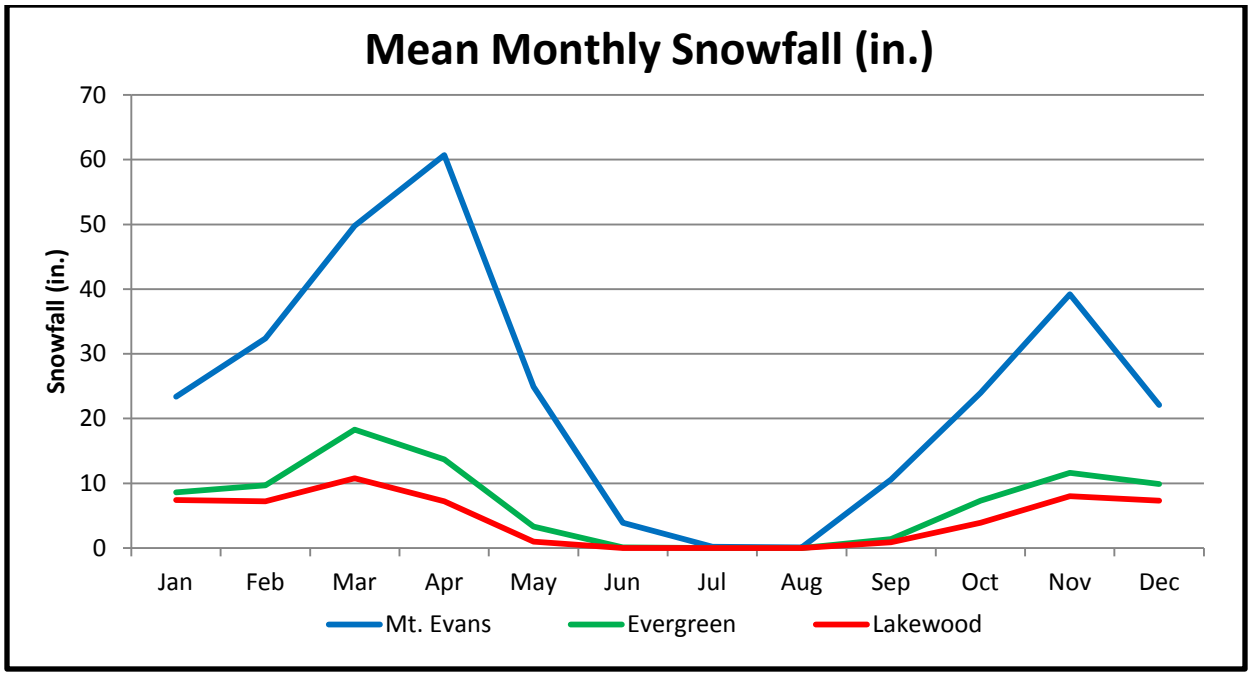


Figure 5: Mean monthly snowfall at Mount Evans, Evergreen, and Lakewood, CO (Colorado Climate Center, http://climate.atmos.colostate.edu/dataaccess.php). Mount Evans data 1983-1999, Evergreen data 1961-2013, and Lakewood data 1962-2010.

Relative to other mountainous regions in Colorado, much of E-39 has relatively mild winters. Typically, high winds, combined with mild and sunny conditions on elk winter range, maintain snow-free conditions on southern and western exposures during much of the winter. Chinook winds, which are warm, dry, down-slope winds, can quickly melt snow and maintain open areas, even on alpine ridges. Much of the landscape that is used by elk as winter range has comparatively mild temperatures and winter weather. Below 9,000 ft., snow seldom stays for more than a few days. However, higher elevations have more severe climates with colder winters, abundant snowfall, and cooler summers. Several snowfall events can occur throughout the winter, but these events are usually quickly followed by warming and snowmelt. Mortality related to winter severity is not thought to be a major factor in the Mount Evans elk herd.

Ecoregions and Vegetation

Appropriately, classification of ecoregions also follows the west-to-east elevation gradient (Chapman et al. 2006). The Environmental Protection Agency (EPA) classifies seven different level IV ecoregions within the herd management area (Table 1).

Table 1: Total area (mi^2) and percent of area in the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, designated by level IV ecoregions according to the Environmental Protection Agency (EPA). E-39 is composed of Game Management Units 39, 391, 46, and 461.

Ecoregion	mi^2	% of Total Area
Alpine Zone	164	16%
Crystalline Subalpine Forests	227	23%
Crystalline Mid-Elevation Forests	377	38%
Foothill Shrublands	53	5%
Moderate Relief Plains	4	<1%
Flat to Rolling Plains	87	9%
Front Range Fans	91	9%

The western most ecoregion is the alpine zone, followed to the east by the subalpine forests, mid-elevation forests, foothill shrublands, Front Range fans, flat to rolling plains, and moderate relief plains (Figure 6). The Front Range fans, flat to rolling plains, and moderate relief plains ecoregions have been lost to development.

Vegetation within the DAU is diverse and dependent on elevation and aspect (Figure 7). The most common vegetation type in the DAU is coniferous, followed by grass/forbs and then developed areas (Table 2). Alpine areas occur at the highest elevations in the DAU on high mountain peaks and basins. Grass/forb, coniferous, and barren cover types are the most frequent vegetation types in the alpine. High-altitude alpine tundra plant communities include grasses, forbs, sedges, shrubs, and willows (*Salix sp.*), krummholz, meadow complexes, shrubby riparian corridors, rock, talus, scree, perennial snow fields, bare soil, and high elevation lakes. The alpine tundra contains rare plants and plant communities due to unique microclimates. Subalpine forests occur from ~8,500 ft. up to timberline (~ 11,600 ft.). The coniferous vegetation types are by far the most common followed by deciduous, grass/forbs, and mixed forest types. Lodgepole (*Pinus contorta*)/spruce (*Picea sp.*)/Douglas-fir (*Pseudotsuga menziisii*) stands, Engelmann Spruce (*Picea engelmannii*)/fir, lodgepole pine, aspen (*Populus tremuloides*), and ponderosa pine (*Pinus ponderosa*) stands, in that order, make up the majority of the forest. Spruce/fir stands interspersed with meadows dominate the higher subalpine areas up to timberline. Stands of limber (*Pinus flexilus*) and bristlecone pine (*Pinus arista*) also occur at higher elevations. Below this, lodgepole pine with aspen is dominant up to 10,500 ft. Aspen, Douglas-fir, lodgepole, and ponderosa occur in mixed and single species stands at the lower elevations of the subalpine ecoregion.

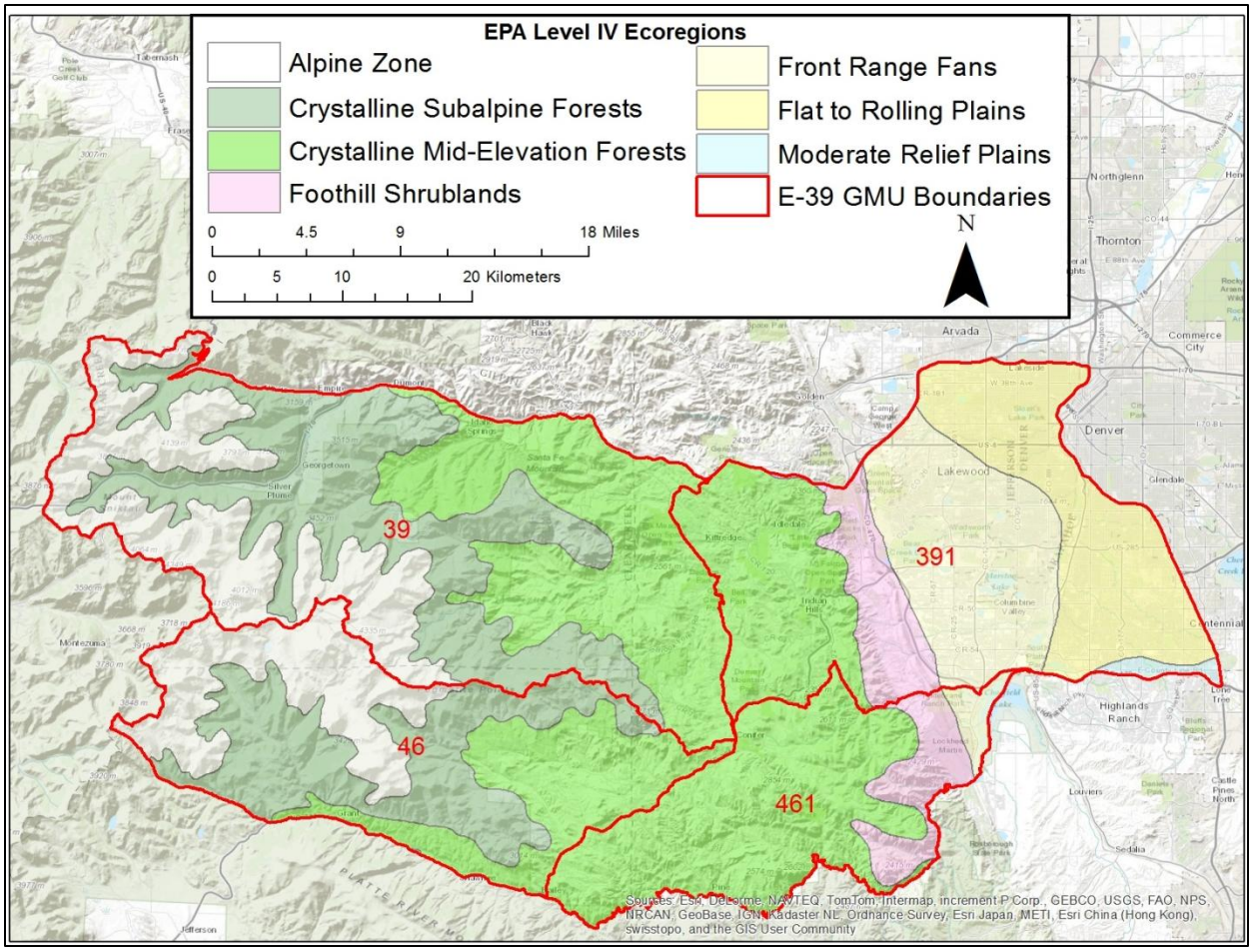


Figure 6: Environmental Protection Agency (EPA) level IV ecoregion designation within DAU E-39. E-39 is composed of Game Management Units (GMU) 39, 391, 46, and 461. Data compiled from Chapman et al. 2006.

At the mid-elevation forest ecoregion, conifer stands are again the most common vegetation type, but grass/forb, shrub/scrub, and riparian vegetation become more common. Ponderosa pine, ponderosa pine/Douglas-fir, Douglas-fir, grassy meadows, lodgepole pine, grass/forb meadow complexes, ponderosa pine/Gambel oak (*Quercus gambelii*), mixed coniferous/deciduous forests, and Gambel oak stands are the most common vegetation types (in that order). Riparian communities are found along streams, wetlands and irrigation ditches from 5,600 to 11,000 ft. Riparian communities support the greatest diversity of plant and animal species. Willows, chokecherries (*Prunus sp.*), alders (*Alnus sp.*), and cottonwoods (*Populus sp.*) are common species. Ponderosa pine dominated communities are found up to 8,500 ft., with Douglas-fir occupying many north-facing slopes in the foothills. There are some agricultural fields, mainly pasture crops, found in suitable areas primarily below 9000 ft.

Foothill shrublands range from approximately 5,500 ft. up to 7,500 ft. In the foothill shrublands, grass/forbs and shrub/scrub rangelands becomes more frequent than

forest stands. Residential and commercial development also becomes more prevalent. Gambel oak, grass and grass/forb meadows, ponderosa pine/shrub, and mixed shrublands are common (in that order). Common shrubs include mountain mahogany (*Cercocarpus sp.*), antelope bitterbrush (*Purshia tridentata*), snowberry (*Symphoricarpos sp.*), serviceberry (*Amelanchier sp.*), sagebrush (*Artemisia sp.*), currant (*Ribes sp.*), juniper (*Juniperus sp.*), and rabbitbrush (*Chrysothamnus sp.*).

The most developed areas occur in the eastern portion of the DAU and along I-70, CO 74, and U.S. 285. As mentioned earlier, the native vegetation of the Front Range fans, flat to rolling plains, and moderate relief plains ecoregions have been lost to development. Development has become the most common land cover type for those three eastern ecoregions. The native grass/forb vegetation has been either developed or replaced with introduced plant species. Agriculture and water storage are also more common in the eastern ecoregions.

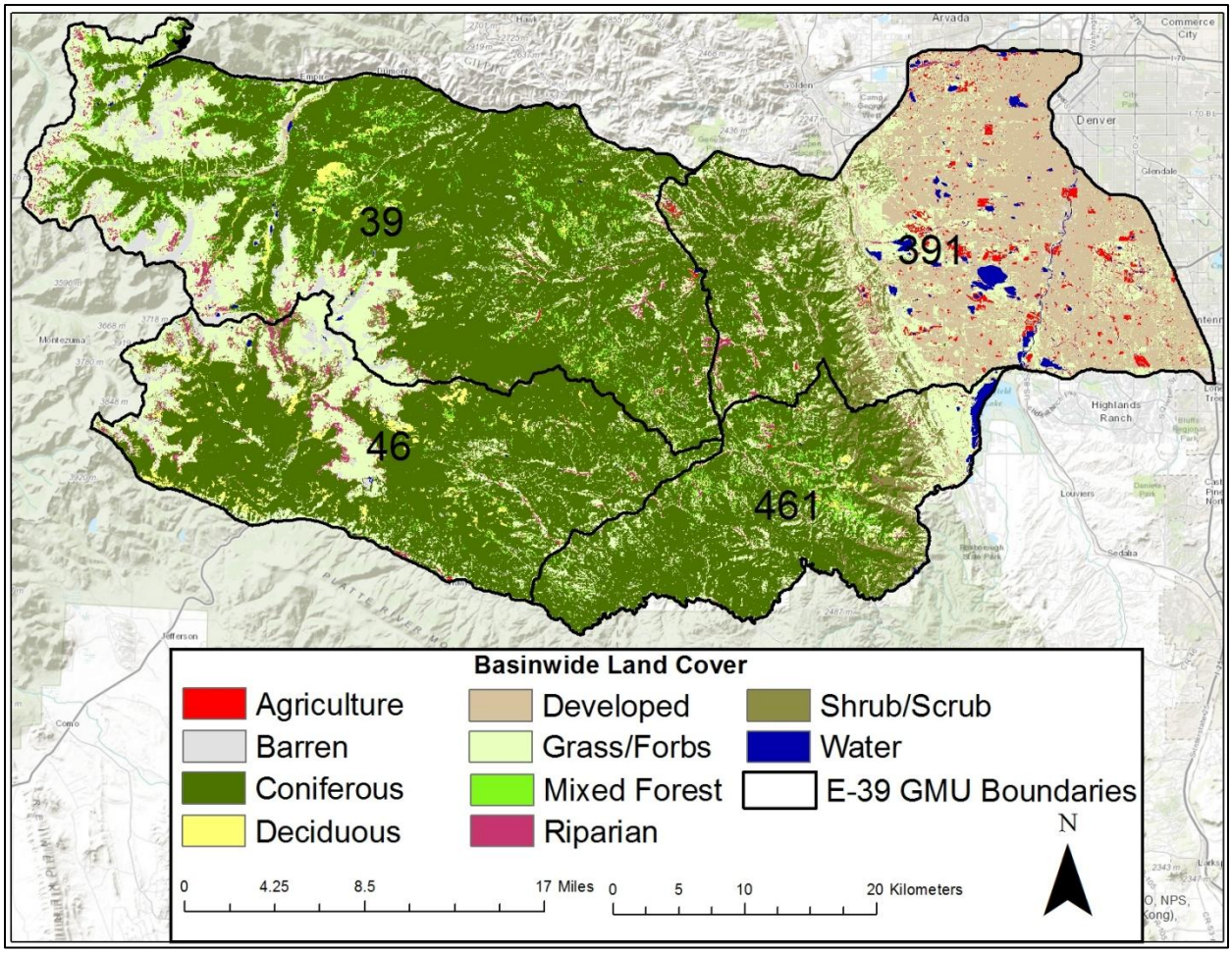


Figure 7: Vegetation types in the Mount Evans elk herd management area, Data Analysis Unit (DAU) E-39, composed of Game Management Units (GMU) 39, 391, 46 and 461. Data compiled from Colorado Parks and Wildlife Basinwide layer package (Simpson et al. 2013).

Table 2: Percent of vegetation type within the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, and individual ecoregions. Compiled from Colorado Parks and Wildlife Basinwide layer package (Simpson et al. 2013). Ecoregions compiled from Environmental Protection Agency (EPA) level IV ecoregions (Chapman et al 2006). E-39 is composed of Game Management Units 39, 391, 46, and 461.

Vegetation Type	DAU	Alpine	Subalpine Forest	Mid-elevation Forest	Foothill Shrublands	Front Range Fans	Moderate Relief Plains	Flat-Rolling Plains
Agriculture	1	0	0	0	1	4	7	4
Barren	4	14	2	1	2	1	8	1
Coniferous	51	21	82	74	15	0	0	0
Deciduous	2	0	5	1	1	0	0	0
Developed	13	0	1	1	10	56	67	76
Grass/Forbs	21	53	5	14	39	31	17	15
Mixed Forest	2	2	4	3	0	0	0	0
Riparian	2	6	0	2	2	1	1	2
Shrub/Scrub	5	3	1	4	30	2	1	0
Water	0	0	0	0	1	5	0	2

HABITAT RESOURCES AND CAPABILITIES

Land Status

Land ownership within the DAU is a varied mosaic on the landscape (Table 3). Roughly one-half of the DAU's 1,003 mi^2 is private land. Most of this private land is within GMUs 391 and 461 in the east, while most of the public land is within GMUs 39 and 46 in the west (Figure 8). The majority of the public lands in the DAU are managed by the USFS. Portions of Arapaho (Clear Creek Ranger District) and Pike (South Platte Ranger District) National Forests are within the DAU. The USFS land is primarily located in the western portion of the DAU (Figure 8). The Mount Evans wilderness area, also managed by the USFS, is approximately 116 mi^2. The Mount Evans State Wildlife Area provides valuable wildlife habitat and recreation related to wildlife and is located west of Evergreen.

Table 3: Land ownership within the Mount Evans elk herd, Data Analysis Unit (DAU), E-39, by DAU and Game Management Unit (GMU). E-39 is composed of GMUs 39, 391, 46, and 461.

	DAU		GMU 39	GMU 46	GMU 391	GMU 461
LAND OWNER	% of DAU	mi²	mi²	mi²	mi²	mi²
Private	51	510	118	50	229	112
USFS	38	380	217	156	0	7
Local Government	8	77	23	<1	42	11
NGO	1	11	<1	<1	4	7
CPW	1	10	5	5	0	0
State Land Board	<1	9	4	2	<1	3
Other Federal	<1	5	0	0	2	3
BLM	<1	0.5	<1	<1	0	<1
Total Area		1003	368	213	278	144

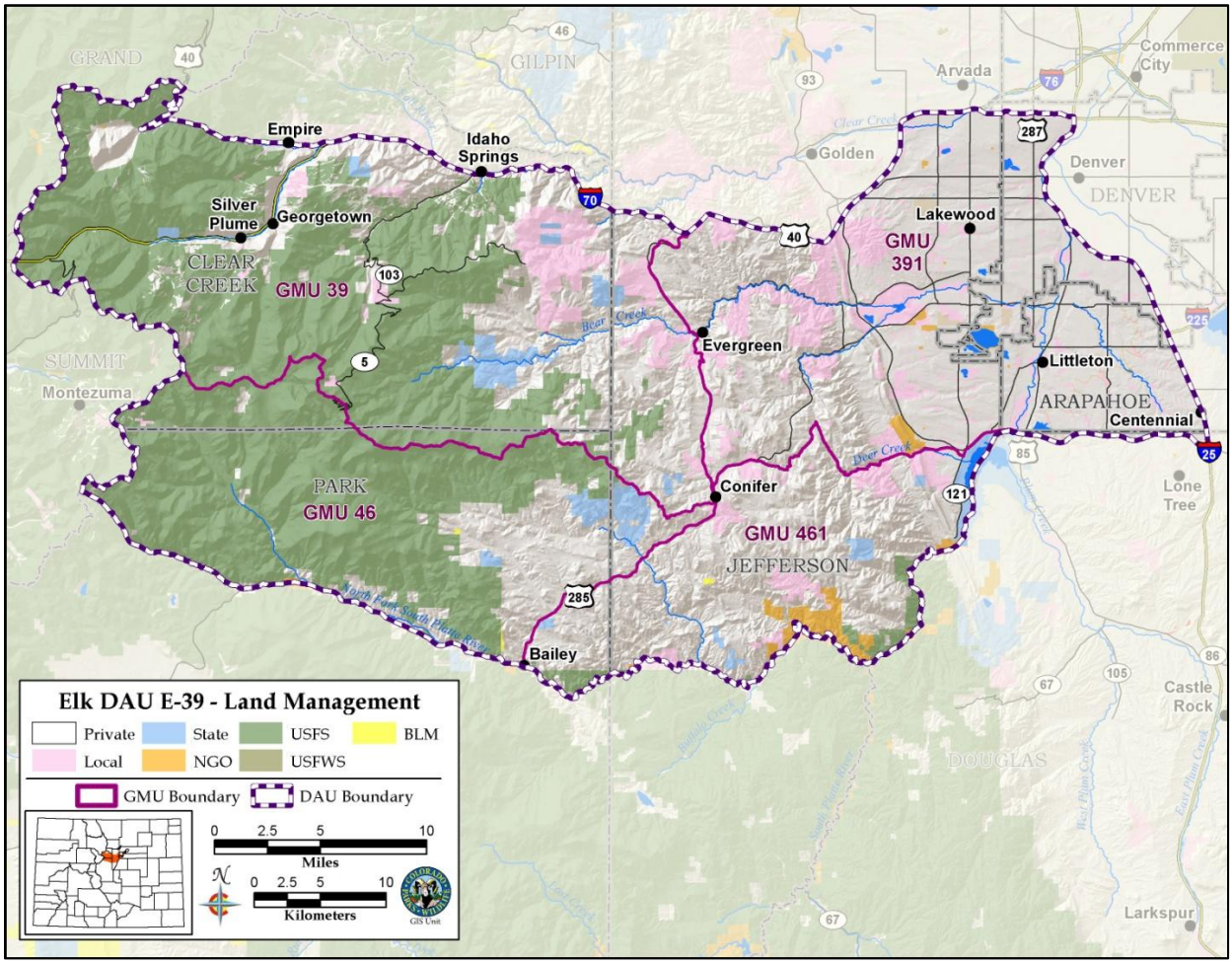


Figure 8: Land ownership within the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, composed of Game Management Units (GMU) 39, 391, 46, and 461.

Denver and surrounding metropolitan areas are within the eastern portion of the herd management area. The central area has smaller municipalities and unincorporated subdivisions, while the western area is composed primarily of USFS land. The majority of private lands and city and county open space properties that provide elk habitat are located in the central and eastern areas of the DAU (Figure 8). Much of the private land in this area has been developed, while the remaining undeveloped land has the potential to be developed. Evergreen, Morrison, and Conifer serve as bedroom communities to the Denver metropolitan area.

With the exception of the greater Denver-metro area, due to habitat loss from development, the entire DAU falls under the broad category of overall elk range (Figure 9). Of the 1003 mi^2 in the Mount Evans herd management area, over 828 mi^2 are considered overall elk range. Overall elk range is defined as the area which encompasses all known seasonal activity areas within the observed range of an elk population. All of GMUs 39 and 46 are considered overall range, while 38% and 99% of GMUs 391 and 461, respectively, are considered overall elk range. Overall elk range is predominantly all of the area in the herd management area west of C-470.

Snow and winter weather force most elk onto winter range at lower elevations. However, some elk remain at high elevation areas, such as the alpine, throughout the winter. Winter range is roughly 40% of the area in the DAU (~400 mi^2). Winter range is defined as that part of the overall range of a species where 90% of the individuals are located during the average five out of ten winters from the first heavy snowfall to spring green-up, or during a site specific period of winter as defined for each DAU. Almost 80% of GMU 461 is winter range (113 mi^2). Mountain valleys in GMUs 39 and 46, and mid-elevation forests and foothill shrublands ecoregions in the eastern portions of GMUs 39 and 46 and western portions of 391 and 461 are areas where most of the winter range in the DAU occurs. Roughly 10% of the DAU is considered winter concentration areas (103 mi^2). Winter concentration areas are defined as that part of the winter range of a species where densities are at least 200% greater than the surrounding winter range density during the same period used to define winter range in the average five out of ten winters. Most of the winter concentration occurs in GMU 391. Only 8% of the DAU is considered severe winter range (84 mi^2). Severe winter range is defined as that part of the range of a species where 90% of the individuals are located when the annual snow pack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten. The majority of winter range in E-39 is private, USFS, and local government (Table 4). The majority of severe winter range occurs around Evergreen and in the foothill shrublands. Winter conditions are seldom severe enough to concentrate elk onto severe winter range in E-39.

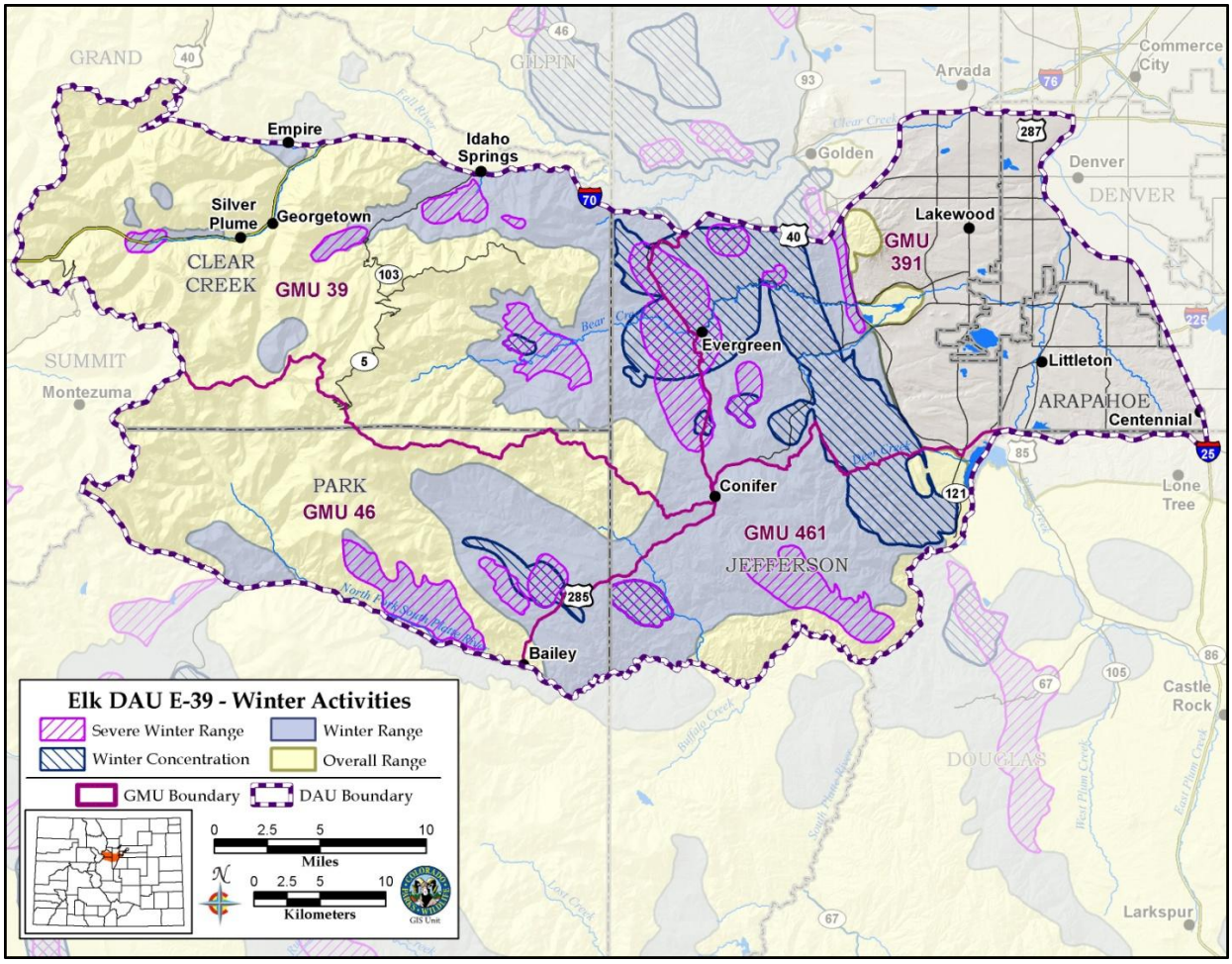


Figure 9: Overall, summer, and winter ranges of the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, composed of Game Management Units (GMU) 39, 391, 46 and 461.

Table 4: Land ownership within the winter range of the Mount Evans elk herd, Data Analysis Unit (DAU) E-39. E-39 is composed of Game Management Units (GMU) 39, 391, 46, and 461.

	DAU		GMU 39	GMU 46	GMU 391	GMU 461
LAND OWNER	% of DAU	mi²	mi²	mi²	mi²	mi²
Private	71	285	73	38	77	99
USFS	15	59	26	29	0	3
Local Government	11	42	14	0	20	8
NGO	<1	4	0	0	1	2
CPW	<1	4	3	1	0	0
State Land Board	1	6	4	1	0	2
Other Federal	0	0	0	0	0	0
BLM	0	0	0	0	0	0
Total Area		400	120	69	98	113

Seasonal Ranges and Elk Distribution

The alpine areas provide excellent summer range because of the high quantity and quality of forage available and refuges from insects. Below the alpine, spruce/fir stands also provide excellent summer forage and security cover. Doulgas fir, aspen, and aspen/conifer stands also provide productive understory, which provides forage and cover for elk, during the summer and fall. Lodgepole stands provide little forage, but good cover due to the high stand density.

High elevation summer range is abandoned by most elk in the colder months for low elevation winter range. Winter range occurs in the foothills, central portions of the DAU, and mountain valleys in the western areas of the DAU. Large resident elk herds also occur year-round in and around Evergreen. Some ponderosa pine stands provide good transitional and winter range, but fire suppression has resulted in the majority of ponderosa stands having unproductive understory. The foothill shrublands and mid-elevation forests grasses, forbs, and browse provide an important forage resource for elk in the winter. However, elk are also observed wintering on the windswept alpine ridges of Mount Evans.

Evergreen Elk Radio-telemetry Study

A small-scale study was conducted in the Evergreen area to examine elk distribution and survival. Radio-collars were initially deployed in September of 2010 and collaring continued for 2 years. If mortalities occurred, radio-collars were redeployed. A total of 21 elk (7 bulls and 14 cows) were collared over the course of the study.

The study confirmed a resident elk herd used the greater Evergreen area. Cow/calf and young bull groups stayed in the area annually. The only exception being when heavy snowfall events occurred, radio-collared elk would move east to the foothills to lower elevations. During severe snowfall events, some radio-collared cows would move north of I-70 into the areas west of Golden (outside of the DAU). For example, in February 2013, three out of 10 collars moved to areas west of Golden during a large snow event. In addition, one radio-collared cow spent some time each summer north of Idaho Springs, which is also outside of the DAU. Finally, some radio-collared bulls that spent the rut in northern Evergreen area would spend the summer and winter north of I-70, again outside of the DAU.

Two bulls and one cow were censored in at least one year of the study because two radio-collars detached prematurely (2 bulls) and one radio-collar stopped functioning (1 cow). All male mortality was due to harvest (n=4), while female mortality was due to harvest (n=2) and vehicle collisions (n=1). Collar deployment and fate are summarized in the table below (Table 5).

Table 5: Radio-collar fates, including survival and mortality information, from the Evergreen elk study during October 2010 to September 2013.

	Oct. 2010 - Sept. 2011			Oct. 2011 - Sept. 2012			Oct. 2012 - Sept. 2013		
	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes
Active Collars	**5**	**11**	**16**	**3**	**12**	**15**	**1**	**10**	**11**
Mortalities	**4**	**1**	**5**	**1**	**2**	**3**	**0**	**0**	**0**
-Harvest	3	1	4	1	1	2	0	0	0
-Roadkill	0	0	0	0	1	1	0	0	0
-Unknown	1	0	1	0	0	0	0	0	0
Survivors	1	10	11	2	10	12	1	10	11
Survival Rate	**0.20**	**0.91**	**0.69**	**0.67**	**0.83**	**0.80**	**1.00**	**1.00**	**1.00**

Land Use

The land use within E-39 is diverse including, but not limited to, industrial sites, metropolitan areas, residential areas, multiple-use public land, and wilderness areas. Human population growth and concurrent commercial, residential, and industrial development, along with associated road infrastructure, have resulted in substantial wildlife habitat loss, degradation, and fragmentation. Much of the private land has been, or has the potential to be, developed into residential, commercial, or industrial sites. Approximately 13% of the herd management area has been developed (Simpson et al. 2013). According to the Colorado Department of Local Affairs (http://www.colorado.gov/cs/Satellite/DOLA-Main/CBON/1251593300013), since 1980, the human population has nearly doubled within the counties that intersect the Mount Evans elk herd management area (Figure 10). Development has occurred throughout the herd management area, but most pervasively in the eastern portion of the DAU in GMUs 391 and 461 in the foothills and plains. Development continues to advance into the more mountainous areas in the west.

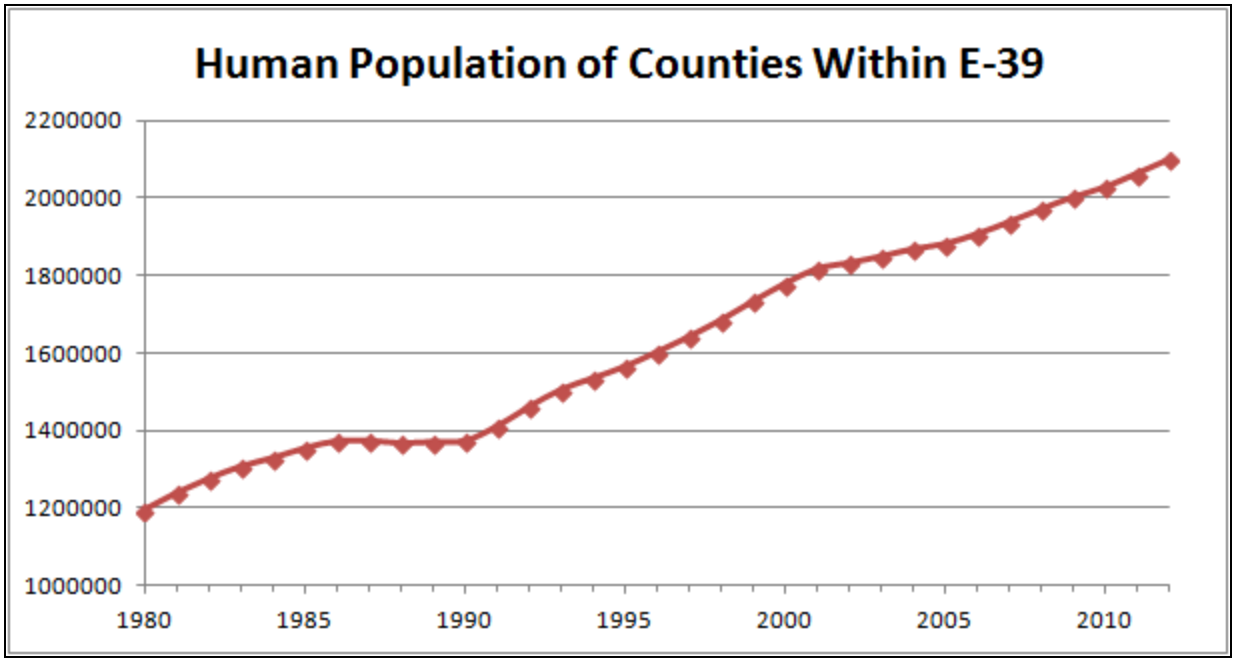


Figure 10: Human population estimates from 1980 to 2012 in Arapahoe, Clear Creek, Denver, Douglas, Jefferson, and Park counties. Source, the Colorado Department of Local Affairs.

Due to development, areas of Arapahoe, Denver, and Douglas counties that are within E-39, no longer provide big game habitat. Few major industries in the above counties are land-use based. Some dryland and irrigated farming and mining operations (gravel and rock extraction) still exist. Major industries include the following: services, trade transportation and utilities, professional and business services, government, education and health services, and construction (Colorado Department of Labor and Employment and city-data.com).

Within the areas of Clear Creek, Jefferson, and Park counties that lie within E-39, land-use based industries still exist (Colorado Department of Labor and Employment). Outdoor recreation and those businesses and services related to outdoor recreation and tourism are important land-based industries. Outdoor recreation on public lands is substantial and ever present. Due to the proximity to the Denver metropolitan area, most lands open to public outdoor recreation are heavily used. The amount of outdoor recreation is at levels that likely impact habitat use of most wildlife species. The USFS lands provide hiking, horseback riding, hunting, fishing, biking, off-road vehicle use, camping, backpacking, skiing, and watchable wildlife opportunities. Rafting also occurs on sections of Clear Creek and the South Platte River. The Loveland Ski Area is on the western boundary of GMU 39, south of I-70. The Mount Evans Wilderness Area, the sole wilderness area in the DAU, is well known for scenic beauty and watchable wildlife. City and county open space and parks also provide

opportunities for outdoor recreation, but hunting is not permitted. The private sector also provides outdoor recreation opportunities on private lands.

Crop production also occurs in the DAU. Less than 1% of the DAU land area is in fallow, dryland, and irrigated croplands (Simpson et al. 2013). Agricultural operations in the foothills and mountains include grass hay production and grazing on private lands up to 9,000 ft. However, few traditional ranching operations still exist. There are currently four cattle grazing allotments in GMU 46, in the South Platter Ranger District, but only two allotments are active (Table 6). Grazing allotments occur in the Clear Creek Ranger District, but information was not available during the DAU planning process. Limited timber harvest also occurs on private and public lands. Mining is still an important industry in Clear Creek County. Real estate development and construction are also important industries to the area.

Table 6: Grazing allotments in the Mount Evans elk herd, Data Analysis Unit (DAU) E-39. E-39 is composed of Game Management Units (GMU) 39, 391, 46, and 461. AUM – Animal Unit Month.

Allotment	GMU	Status	Type	AUMs	Stocking Number
Elk Creek	46	Vacant			
Crow Gulch	46	Active	Cattle	157	30 pair herd
Geneva	46	Active	Cattle	500	85 pair herd
Kenosha	46	Vacant			

Habitat Condition and Capability

Based upon observed and modeled population metrics (population size and recruitment) and habitat conditions, it's likely that the Mount Evans elk herd is below the biological carrying capacity of the DAU. Since 2001, intentional increases in annual harvest have significantly decreased the herd size. No recent CPW studies have been conducted, but based upon observation of the overall DAU, overutilization of important habitat types and forage resources, such as riparian areas and winter range, is not currently an issue. Heavy utilization of forage resources in and around unincorporated subdivisions and refuges is occurring in isolated areas of the DAU. It's not likely that we will observe habitat indicators of the herd approaching carrying capacity because social carrying capacity of the herd is lower than the biological carrying capacity.

The quantity and quality of winter range is likely the most limiting biological factor of the Mount Evans elk herd. However, the link between traditional winter range and elk population dynamics in E-39 is not as direct a relationship as is observed in elk herds dependent on undeveloped ranges in Colorado. In E-39, mild winters,

anthropogenic conditions resulting from development, and the adaptability of elk commonly result in situations of elk using unique and novel environments during the winter. However, omnipresent development has drastically reduced the quantity of winter habitat available resulting from habitat loss, degradation, and fragmentation. While housing sprawl has had an overriding detrimental effect of displacing elk, some elk have adapted to living in and around residential areas. In certain areas, the secondary effects of residential development may have artificially increased habitat productivity to elk by increasing forage quality (via manicured lawns and ornamental plants and reducing natural predation rates of elk in residential areas). The extensive road network in the DAU has added to habitat fragmentation and increased mortality due to vehicle strikes. As mentioned above, elk also winter on the alpine.

The habitat quality of winter and transitional range is fair. Fire suppression has decreased range productivity through succession and maturation of plant communities. During the last century, succession has decreased the amount and quality of elk forage. However, in areas where wildfires, controlled burns, and mechanical habitat treatments have occurred, habitat quality has improved. The USFS has recently conducted fuels mitigation work in the wildland-urban interface near Harris Park and will continue similar projects south of Deer Creek in the coming years. Habitat improvement projects are continually being implemented on the Mount Evans and Bergen Peak State Wildlife Areas. In addition, the Habitat Partnership Program (HPP) is active in GMUs 46 and 461. Habitat Partnership Program projects in the DAU have included fencing, fertilization, well installation, solar pump installation, and willow removal. Burns and forest thinning have occurred on Staunton State Park. In addition, Jefferson County is improving elk habitat on private land within Jefferson County through forestry projects. Large-scale habitat improvements, in those habitat types that historically experience regular disturbances (e.g., ponderosa pine stands), would be beneficial for all wildlife in the area. The Natural Resources Conservation Service (NRCS) has also contributed to habitat improvement projects in the DAU.

Conservation easements on large natural and intact areas that have the potential to be developed will also be beneficial to all wildlife. Mountain Area Land Trust, Clear Creek County, and the USFS collaborated to secure the Beaverbrook Watershed conservation easement. The easement is located in GMU 39, northwest of Evergreen. The 1,382 acre easement prevented the development of an area which was zoned and approved for 40 houses. Other conservation easements include the Deer Creek Ranch in GMUs 46 and 461 and the Lockheed-Martin and Resort Valley Ranch in GMU 461.

High elevation summer ranges remain productive areas for elk. However, it is possible that the high levels of outdoor recreation are reducing the availability of

summer range to elk via displacement and avoidance. The level of outdoor recreation may even increase elk conflicts, if elk are displaced onto private lands.

Some areas of the DAU are currently experiencing a beetle infestation. Infestations are occurring at elevations where mixed stands of ponderosa and lodgepole pine occur. Mountain pine beetle activity in ponderosa pine is expected to continue or increase over the next several years. While there is a great deal of information on the effects of the mountain pine beetle on forest health, little is known about the effects of this infestation on wild ungulate populations. In addition, the USFS South Platte Ranger District indicated that spruce beetles may affect Engelmann spruce locally in the future. Current speculation suggests that the death of beetle-killed trees and the consequent opening of the forest canopy will enhance understory forage for ungulates in the future, but may change elk distribution. On a statewide basis, the USFS and CPW will continue to monitor the pine and spruce beetle infestations and their effects on ungulate habitat and distribution. Finally, western portions of the DAU have experienced wide-scale forest blow-down. In GMU 39, a large area of spruce forest blow-down occurred in the Mount Evans Wilderness Area. In GMU 46, blow-down may have impacted elk distribution and migration corridors.

Bighorn sheep, moose, mountain goat, mule deer, and white-tailed deer populations overlap with the Mount Evans elk herd. Although range overlap of the above ungulates with elk does occur, the overlap is predominantly spatially and temporally segregated. In addition, the densities of each of these big game species are likely low enough that little competition with elk exists. If competition does manifest with elk and any of the above species, it's likely that the competitive effects on elk productivity are limited and that elk will outcompete the other species. Elk typically have the competitive advantage because they are able to shift their diet to the most available forage resources (grazing or browsing), use a wide variety of habitats, and have a relatively high fecundity rate (Boer 2007).

Elk primarily overlap with bighorn and mountain goat in the summer when the availability of forage resources is at its apex. This overlap occurs in the very rugged topography of the highest elevations of the DAU. Elk competition with moose can occur for willow along riparian corridors and wetlands. The moose population in the DAU is small, but expanding and thought to be in an irruptive stage of population growth. However, moose are obligate browsers and most likely will not be able to compete with the adaptable foraging behavior of elk. In addition, elk and moose tend to segregate in the winter. In winter, elk generally move to lower elevations to evade deep snow, while moose are tolerant of greater snow depths. Limited competition between elk and deer may occur on winter range in and near residential areas, private land refuges, and open space refuges. However, due to the reasons stated

above, regarding foraging adaptability and the larger size of elk, elk outcompete deer for forage resources and space. Competition between elk and deer on other public lands is likely not an issue because of relatively low elk and deer densities. In studies, commensalism browsing by moose, deer, and elk that benefits those species by maintaining forest edge and meadow openings has been documented (Boer 2007).

Conflicts with Agriculture

Opinions of agriculture producers in the DAU regarding the appropriate social carrying capacity of elk are mixed (see Public Involvement section below). In areas where sedentary resident elk herds occur in and around developed areas, some producers enjoy elk, while other producers feel there are too many elk. In areas where elk densities are low or have been historically higher, producers are concerned about the low number of elk currently on the landscape. Overall, it appears the elk herd is below the social carrying capacity of the DAU, but in isolated areas producers that experience more elk conflicts have more varied opinions.

Elk game damage claims in the DAU are infrequent (Figure 11). Elk damage claims fluctuated from 1995 to 2002, spiked in 2003, and then declined markedly from 2004 to 2013. In 2013, no elk damage claims were paid in E-39. The decline in claims paid coincides with the decline in the elk population size (Figure 12). However, with the exception of no elk on the landscape, it's likely that there is a lower threshold in elk damage claims paid, regardless of how small the elk population becomes.

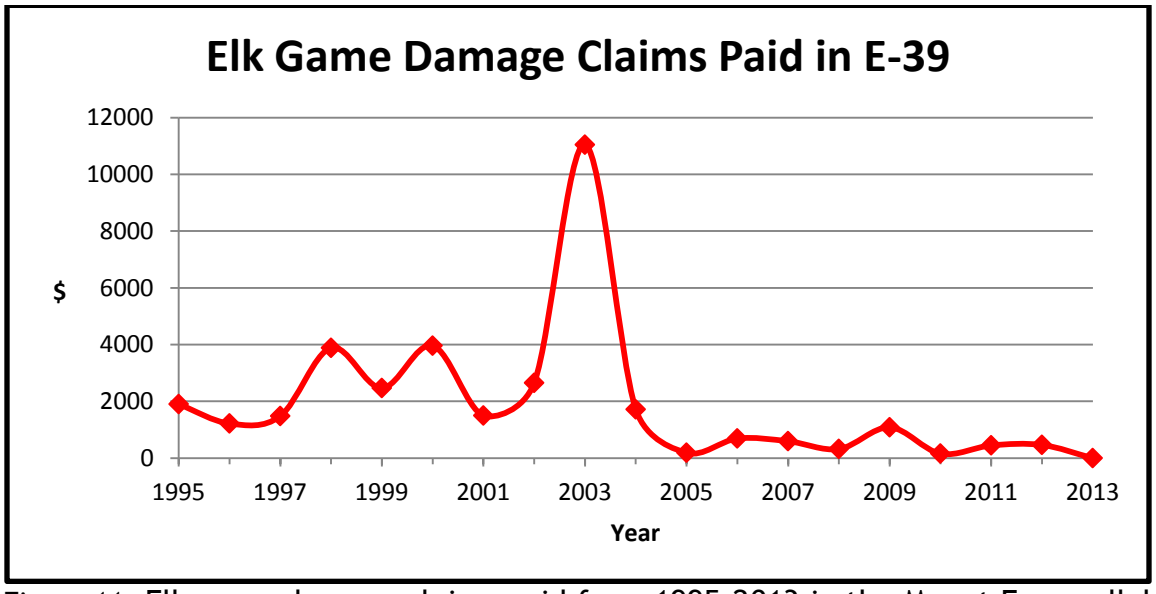


Figure 11: Elk game damage claims paid from 1995-2013 in the Mount Evans elk herd, Data Analysis Unit (DAU) E-39. The Mount Evans elk herd is composed of Game Management Units 39, 391, 46, and 461.

Agricultural conflicts with elk in the Mount Evans herd are limited. Agricultural conflicts are defined here as wildlife conflicts with an agriculture producer operating as an agriculture business. Livestock and elk competition in the DAU is minimal and isolated. Low elk and domestic stock densities result in few conflicts. Livestock grazing may compete with big game for forage resources, but it is unlikely that the current level of elk grazing has a competitive effect on livestock grazing. This is because sometimes livestock is confined to small areas or water sources by fencing, while elk tend to exhibit more roaming behavior. Some studies suggest that moderate grazing may promote grass and shrub productivity and benefit both livestock and big game.

HERD MANAGEMENT HISTORY

Estimating numbers of wild animals over large geographic areas is a difficult and approximate science. Numerous attempts have been made to accurately count known numbers of wild animals in large fenced areas. All of these efforts have failed to count 100% of the animals. Colorado Parks and Wildlife recognizes the difficulties of estimating the size of big game populations as a challenge in managing populations. The agency continually attempts to maximize the accuracy of those estimates by using the latest technology and inventory methodology available. As better information and techniques become available (e.g., new estimates of survival/mortality, wounding loss, sex ratios, density, or new modeling techniques and software), they are evaluated and used where appropriate.

Population estimates are derived from population models created with the help of computers. Starting in the early 1970s, CPW biologists derived population estimates with ONE POP software. In the early 1980s, population estimation software was updated to the POP II software. After 1999, spreadsheet models replaced POP II. In 2008, the spreadsheet models were standardized based upon population modeling methods developed by White and Lubow (2002). This approach integrates multiple biological factors, including mortality rates, initial population size, sex ratio at birth, observed sex and age ratios, hunter harvest, and wounding loss. The models are aligned on post-hunt sex ratios observed during winter classification. For some herds, abundance estimates are derived from either line transect or quadrat surveys.

When herd management plans are revised, a suite of population models is constructed and the best model(s) are selected. During the population modeling process, new models may fit better than old models and provide new and different population and sex ratio estimates. The process of altering population estimates when new and better models and/or data become available is termed indexing. When indexing occurs, adjustments to population objectives and estimates can occur in the absence

of changes to license numbers. The population estimates presented in this document should, therefore, not be considered a completely accurate enumeration of the animals in the herd.

Elk in this herd are difficult to count and classify. Elk frequently use residential and forested areas, which greatly reduces sightability from the air and ground. Aerial surveys are not effective because of high winds, lack of consistent snow cover, and elk use of residential areas. Observed data are collected primarily via ground surveys. The Mount Evans elk herd population estimate is not based upon direct estimates of density or abundance. Herd size is estimated using computer generated population models that utilize estimated harvest along with age and sex ratios.

Classification surveys in this herd are conducted primarily by coordinated ground classification surveys when elk are present on winter range. Classification surveys are conducted at the conclusion of hunting seasons. During classification surveys, elk are classified as cows, calves, yearling bulls, 2 year-old bulls, mature bulls, and unknown. The surveys produce actual field observations and are not the result of computer modeling. All classification counts are summarized as the number of males or number of young of the year per 100 females. Bull: cow ratios include bulls of all ages, with the exception of the young of the year. Bull: cow ratios are often underestimated because of differential sightability of bulls vs. cows due to behavioral differences between bulls vs. cows and calves. During winter, cows, calves, and young bulls often congregate into large groups, while older bulls form smaller bachelor groups. It is more difficult to locate smaller groups of animals, so small bull groups are missed more frequently than large cow-calf groups. The sightability differences result in negatively biased observed bull:cow ratio estimates.

Post-hunt Population Size

Historically, elk were abundant in Colorado. By the early 1900s, market hunters, supplying the mining industry, had depleted the elk herds. Reintroductions in the early 1900s and restrictions on harvest slowly increased elk numbers over the 20th century.

According to population models at the time, the Mount Evans elk herd post-hunt population size increased linearly from approximately 1,650 elk in 1980 to approximately 2,500 elk in 1997 (George 1998). Recent population models indicate the post-hunt population increased from the mid 1990s to around the year 2000 and then began a long decline to present (Figure 12). The population decline at the turn of the century was due to increased license quotas and harvest in an attempt to bring the population down towards the objective and reduce human-elk conflicts in suburban and unincorporated residential areas of the DAU.

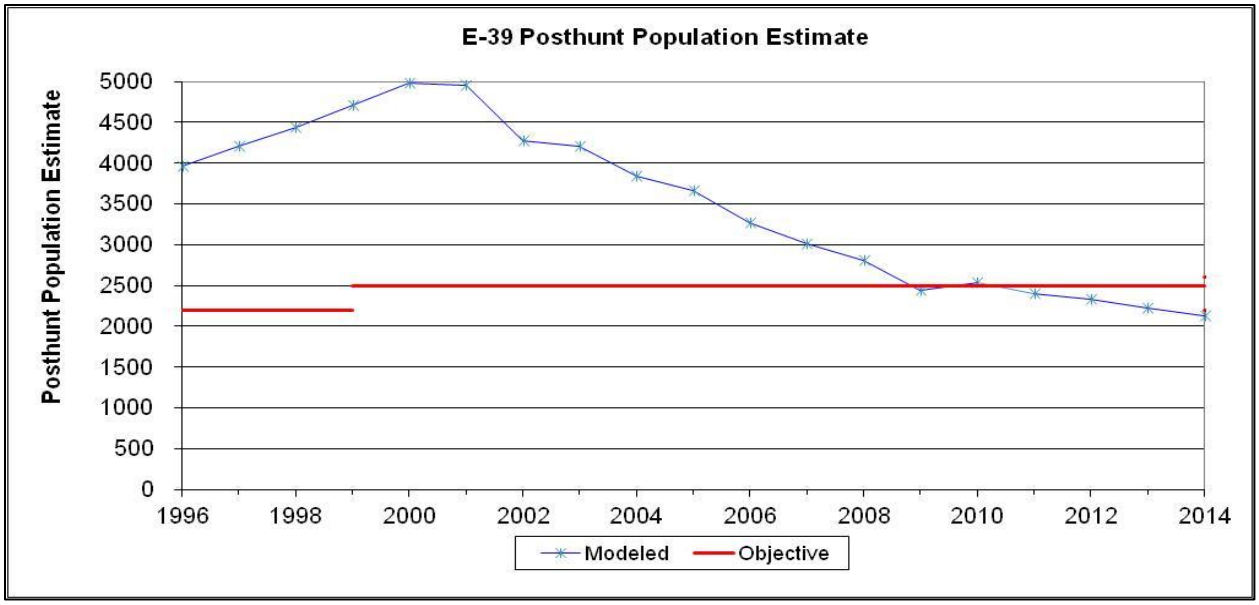


Figure 12: Post-hunt modeled estimate and objective population size from 1996 to 2014 of the Mount Evans elk herd, Data Analysis Unit E-39, composed of Game Management Units 39, 391, 46 and 461.

Post-hunt Herd Composition

Bull: Cow Ratio

The bull:cow ratio, expressed as the number of bulls per 100 cows, is used as an index of bull hunting opportunity and bull age at harvest (i.e., antler size). Historically, the Mount Evans elk herd was recognized as a quality elk hunting area (George 1998). More recently, bull hunting has been managed more towards bull hunting opportunity rather than older, large-antlered bulls (i.e., more bull licenses have been offered relative to the estimated population size).

There are ten years of observed post-hunt sex ratio data between 1996 and 2013 (Figure 13). Observed bull: cow ratios indicate a declining trend after 2007, whereas modeled estimates indicate a mostly stable trend over the same time period. As mentioned above, population models are an approximate science. Considering observed bull: cow ratios are biased low, the true bull: cow ratio likely lies somewhere between the observed and modeled estimates. However, based upon CPW observations, license quotas, success rates, and public comments, it is likely that the bull: cow ratio has been declining.

Calf: Cow Ratio

The post-hunt calf:cow ratio, expressed as the number of calves per 100 cows, is used as an index of herd productivity. The index roughly reflects the combined summer natality and summer-to-early winter survival rate of calves relative to cows. There are nine years of observed post-hunt age ratio data between 1996 and 2013, concurrent with the observed sex ratio data (Figure 14). The current 3 year average

(2011-2013) is 45 calves: 100 cows, which is average to above average relative to other elk herds in Colorado at present.

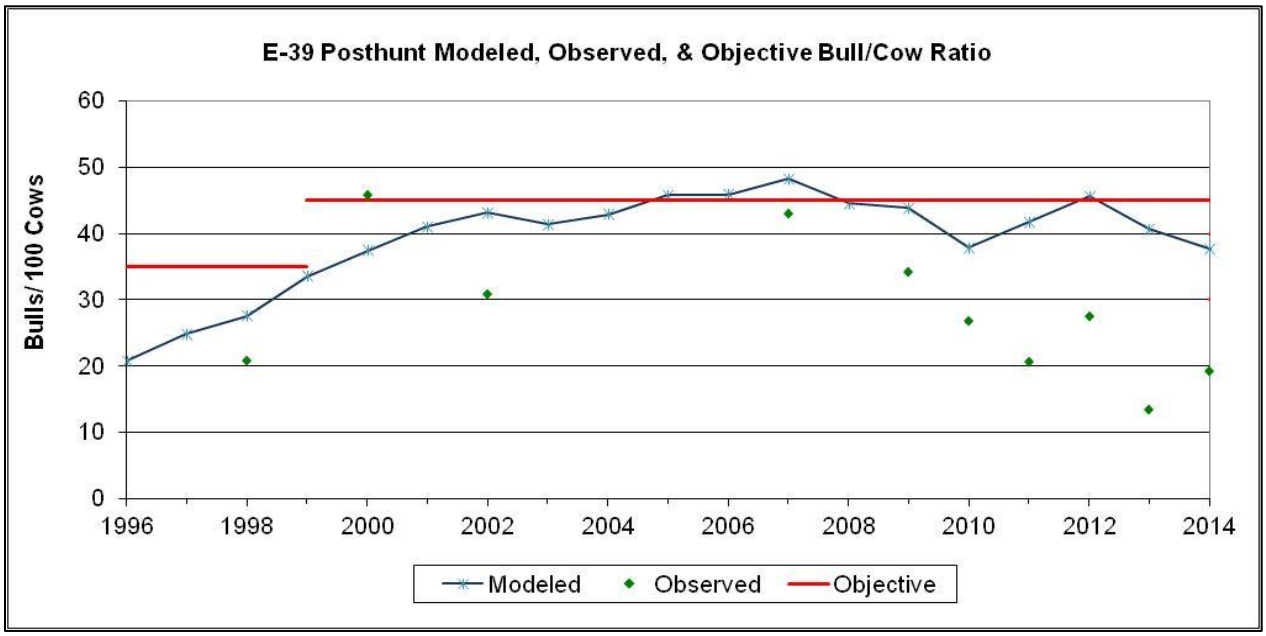


Figure 13: Modeled, observed, & objective sex ratio from 1996 to 2014 of the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, composed of Game Management Units (GMU) 39, 391, 46, and 461.

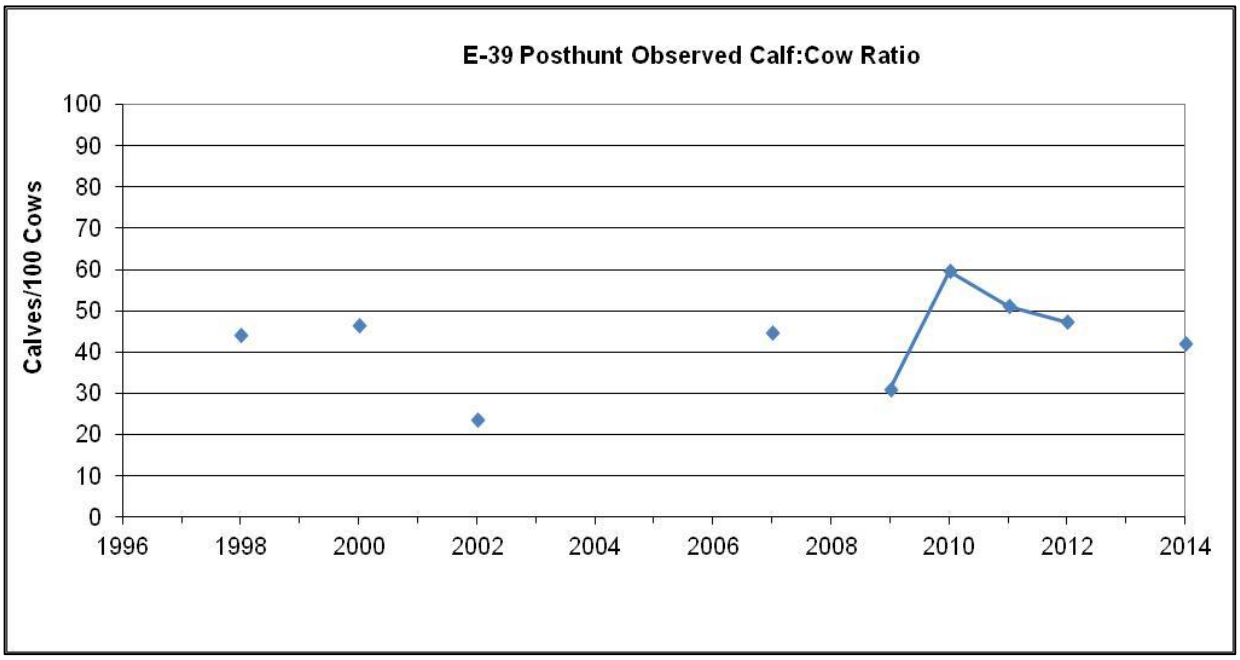


Figure 14: Observed age ratio from 1996 to 2014 of the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, composed of Game Management Units (GMU) 39, 391, 46 and 461.

Harvest and Hunters

License Allocation

Hunting seasons in E-39 have included archery, muzzleloader, rifle, and antlerless private-land-only (PLO) seasons. In 1986, the Wildlife Commission approved the statewide implementation of three combined deer and elk rifle seasons to reduce hunter crowding. The adopted 1986 season structure encompassed E-39. After 2000, each GMU within E-39 consisted of a single archery season, one muzzleloader season, four rifles seasons, and one PLO cow season. The only exception to the above statement is GMU 391, which does not offer any of the four regular rifle antlerless seasons. In GMU 391, hunting is only available on private land. Therefore, all rifle antlerless hunting is through PLO licenses. The PLO licenses are valid only on private lands from September 1st through January 31st.

Licenses for the Mount Evans elk herd have been limited in availability for a substantial period. This means that over-the-counter licenses have not been available. Over the last 28 years, seasons and license numbers have changed. Since 2000, the number of seasons in E-39 has remained the same. Previous license allocation for GMUs 39, 391, 46, and 461 are shown in Tables 7, 8, 9, and 10, respectively.

The number of licenses issued in E-39 has increased substantially (Figure 15). Since 1987, the number of elk licenses available increased to the apex of 3,455 in 2006. The number of licenses was on a moderately increasing trend from 1987 to 1998, a sharply increasing trend from 1998 to 2002, and a slightly increasing trend from 2002 to 2008. The increase in licenses available from 1987 to 2008, PLO seasons, and 4th seasons were all implemented to reduce the size of the herd. The number of licenses available has been on a decreasing trend from 2008 to 2014. After 2008, the number of licenses available was reduced because the 1) size of the elk herd declined towards the population objective and 2) elk conflicts declined.

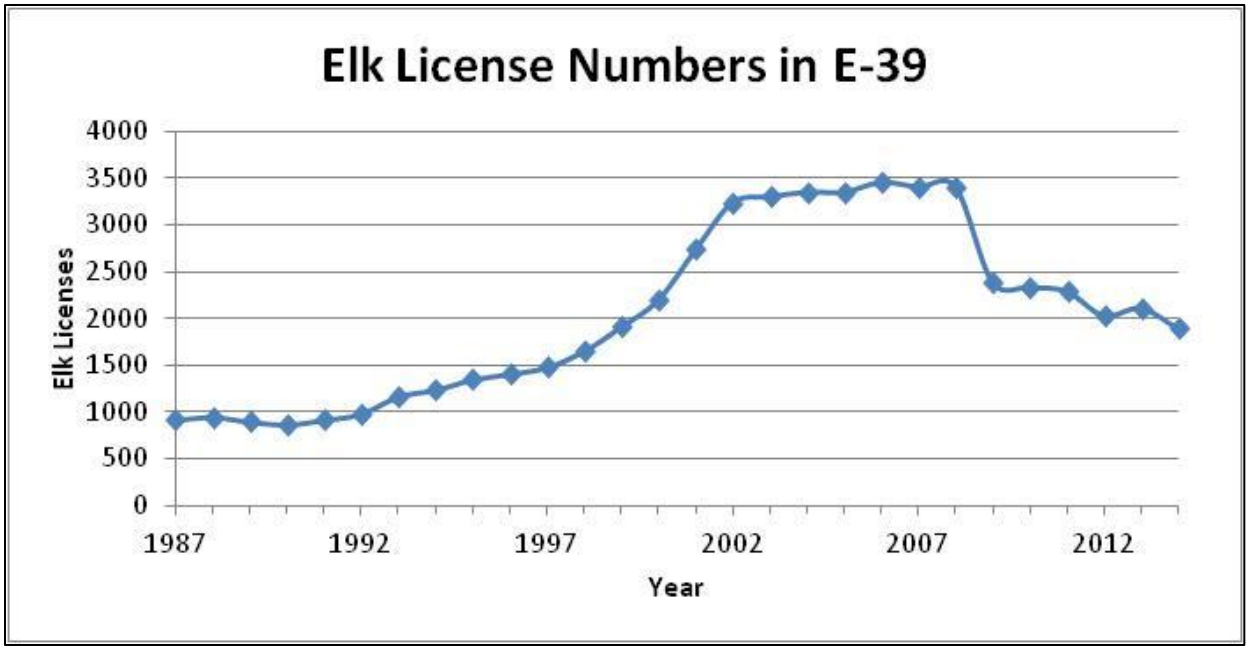


Figure 15: Elk licenses issued in the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, composed of Game Management Units (GMU) 39, 391, 46 and 461.

Table 7: Number of elk licenses in Game Management Unit (GMU) 39 from 1987 to 2014. Arch = Archery; Muzzle = Muzzleloader; ES = Either Sex; blank cell = not an established season ; PLO = Private-Land-Only; " = Float, * - combined with Muzzle Cow.

Season	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Arch ES	100	130	130	110	110	110	110	110	110	110	110	110	110	110	130	130	130	130	130	130	130	130	90	90	90	100	110	110
Muzzle Cow	45	110	20	0	0	25	70	70	70	70	70	70	70	70	70	70	80	80	80	80	80	80	60	60	60	60	60	60
Rifle Cow 1	220	135	135	170	175	45	70	70	60	60	60	60	60	60	60	60	60	60	60	60	60	60	30	30	30	30	30	30
Rifle Cow 2	"	"	"	"	"	125	145	145	125	125	125	185	185	185	185	185	185	185	185	185	185	185	150	150	150	150	150	150
Rifle Cow 3	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Rifle Cow 4														"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
PLO Cow									80	80	120	160	150	175	225	300	325	325	325	425	425	425	250	250	250	150	150	150
Muzzle Bull	*	*	95	95	100	105	90	105	105	105	105	105	105	105	125	125	125	125	125	125	125	125	80	80	80	70	80	80
Rifle Bull 1	150	175	165	135	125	125	100	100	150	150	150	200	150	45	90	100	100	100	100	100	100	100	70	70	70	60	70	70
Rifle Bull 2	"	"	"	"	"	"	"	"	"	"	"	"	"	105	90	90	90	90	90	90	90	90	70	70	70	60	70	70
Rifle Bull 3	"	"	"	"	"	"	"	"	"	"	"	"	"	"	80	80	80	80	80	80	80	80	70	70	70	70	70	70
Rifle Bull 4														"	30	30	30	30	30	30	30	30	20	20	20	20	20	20

Table 8: Number of elk licenses in Game Management Unit (GMU) 391 from 1987 to 2014. Arch = Archery; Muzzle = Muzzleloader; ES = Either Sex; blank cell = not an established season; PLO = Private-Land-Only; " = Float.

Season	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Arch ES													50	50	50	50	50	50	50	50	50	50	40	40	40	40	40	40
Muzzle Cow													50	50	50	20	20	20	20	20	20	20	20	20	20	20	20	20
Rifle Cow 1													15															
Rifle Cow 2													30															
Rifle Cow 3													"															
Rifle Cow 4																												
PLO Cow													50	200	300	400	400	450	450	450	450	450	300	300	300	225	225	225
Muzzle Bull													30	30	50	50	50	50	50	50	50	50	35	35	35	30	35	35
Rifle Bull 1													30	30	30	50	75	75	75	75	75	75	60	60	60	50	60	60
Rifle Bull 2													"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Rifle Bull 3													"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Rifle Bull 4														"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

Table 9: Number of elk licenses in Game Management Unit (GMU) 46, 1987 to 2014. Arch = Archery; Muzzle = Muzzleloader; ES = Either Sex; blank cell = not an established season; PLO = Private-Land-Only; " = Float, * - combined with Muzzle Cow.

Season	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Arch ES	70	50	60	50	50	50	50	50	50	60	60	60	60	60	80	100	100	100	100	80	80	80	60	60	60	60	60	60
Muzzle Cow	30	35	5	0	0	5	30	30	30	40	40	40	40	40	40	40	40	40	40	25	25	25	25	25	25	25	25	25
Rifle Cow 1	175	100	60	95	95	25	40	40	40	40	40	40	40	40	40	50	50	50	50	25	25	25	25	25	25	25	25	25
Rifle Cow 2	"	"	"	"	"	80	130	130	130	130	130	130	130	130	130	150	150	150	150	150	150	150	150	150	150	150	150	80
Rifle Cow 3	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Rifle Cow 4														"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
PLO Cow													15	25	50	100	100	100	100	150	150	150	75	75	75	50	50	50
Muzzle Bull	*	*	30	35	35	35	35	35	35	50	50	50	50	50	50	75	75	75	75	50	50	50	30	30	30	25	30	30
Rifle Bull 1	120	100	125	95	95	95	100	100	100	125	125	125	125	30	30	60	60	60	60	50	50	50	30	30	30	25	30	30
Rifle Bull 2	"	"	"	"	"	"	"	"	"	"	"	"	"	95	95	120	120	120	120	120	120	120	80	80	80	80	80	80
Rifle Bull 3	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Rifle Bull 4														"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

Table 10: Number of elk licenses in Game Management Unit (GMU) 461 from 1987 to 2014. Arch = Archery; Muzzle = Muzzleloader; ES = Either Sex; blank cell = not an established season; PLO = Private-Land-Only; " = Float, * - combined with Muzzle Cow.

Season	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Arch ES		30	15	15	30	30	30	30	30	30	30	30	40	80	80	80	80	80	80	80	80	80	70	70	55	55	55	55
Muzzle Cow		25	5	0	0	10	20	20	20	20	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Rifle Cow 1						15	20	20	20	20	20	20	20	50	50	50	50	50	50	100	50	50	50	50	50	50	50	50
Rifle Cow 2		20	20	35	45	45	70	70	70	70	70	70	70	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Rifle Cow 3		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Rifle Cow 4														"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
PLO Cow								50	50	50	75	100	125	250	350	500	500	500	500	500	500	500	300	250	250	250	250	100
Muzzle Bull		*	15	20	35	35	35	35	35	35	35	35	35	35	50	50	50	50	50	50	50	50	40	40	30	25	30	30
Rifle Bull 1		35	15	20	20	20	20	25	35	35	35	35	50	75	100	100	100	100	100	100	100	100	80	80	60	50	60	60
Rifle Bull 2		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Rifle Bull 3		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Rifle Bull 4														"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

Harvest

Harvest is estimated with surveys based upon the principles of survey sampling. The trend in harvest mirrors the trend in the license availability. Harvest increased from 1987 to 2004 to the estimated high of 757 (Figure 16). After 2004, harvest has been on a decreasing trend because licenses have been reduced as the elk herd has declined towards the population objective.

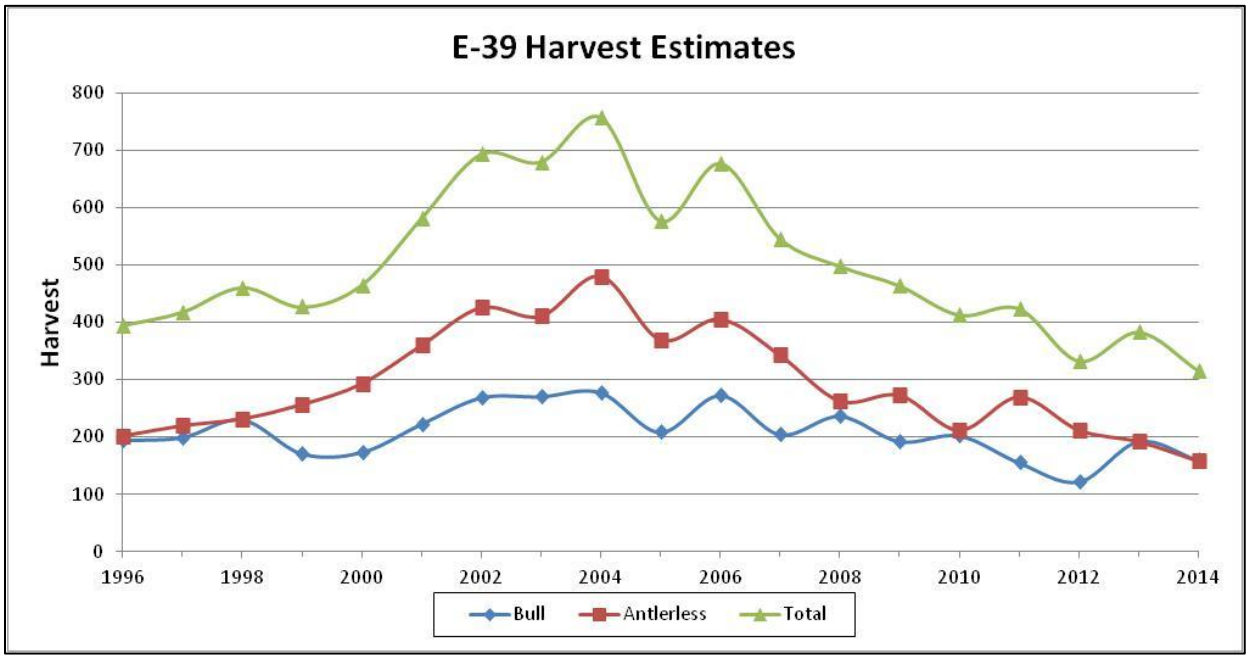


Figure 16: Estimated bull, antlerless, and total harvest of the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, composed of Game Management Units (GMU) 39, 391, 46 and 461 from 1987 to 2014.

More elk are harvested in the northern GMUs (Figure 17). Singularly, harvest in GMU 39 is often similar to the cumulative harvest in GMUs 391, 46, and 461.

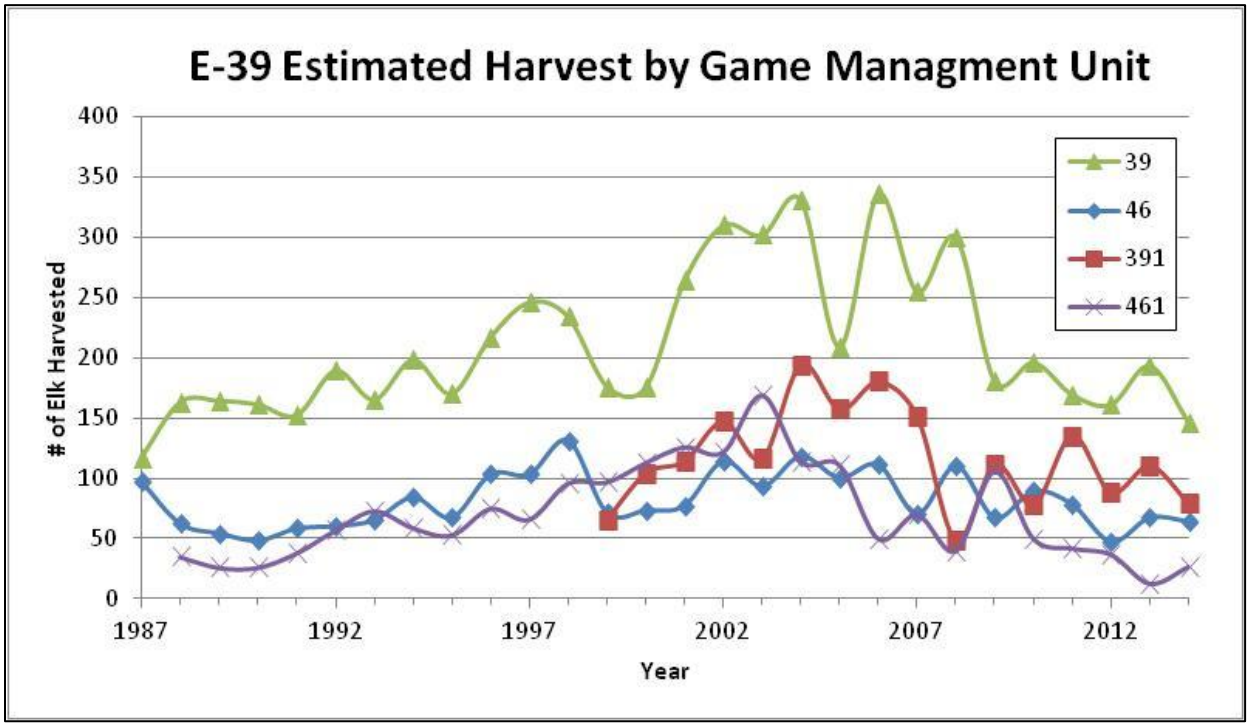


Figure 17: Estimated elk harvest of the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, by Game Management Unit (GMU) 39, 391, 46 and 461.

Hunter Numbers

Because all elk licenses in E-39 are limited, the number of hunters is determined by the license quota. License availability is the most important determinant of hunters afield and hunters afield is the most important determinant of harvest. Therefore, license availability is the most important factor determining the number of elk harvested.

The number of hunters afield mirrors the trend in licenses issued (Figure 18). The number of hunters has been on a decline since 2004 because the number of licenses available has been reduced as the elk herd has moved towards the previous population objective and elk conflicts have declined.

As license numbers and harvest are highest in GMU 39, the number of hunters is also highest in GMU 39 (Figure 19). The number of hunters is higher in the western GMUs, containing predominantly more public land, than the eastern GMUs, containing predominantly more private land.

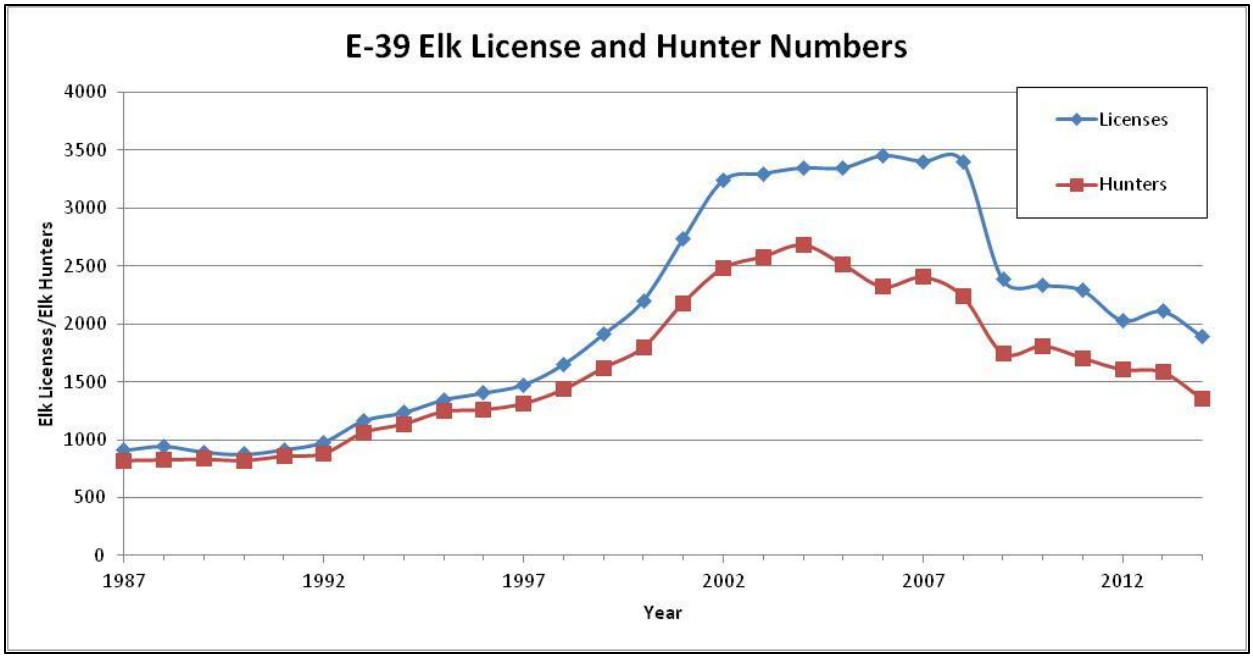


Figure 18: Elk licenses available and hunters in the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, composed of Game Management Units (GMU) 39, 391, 46 and 461.

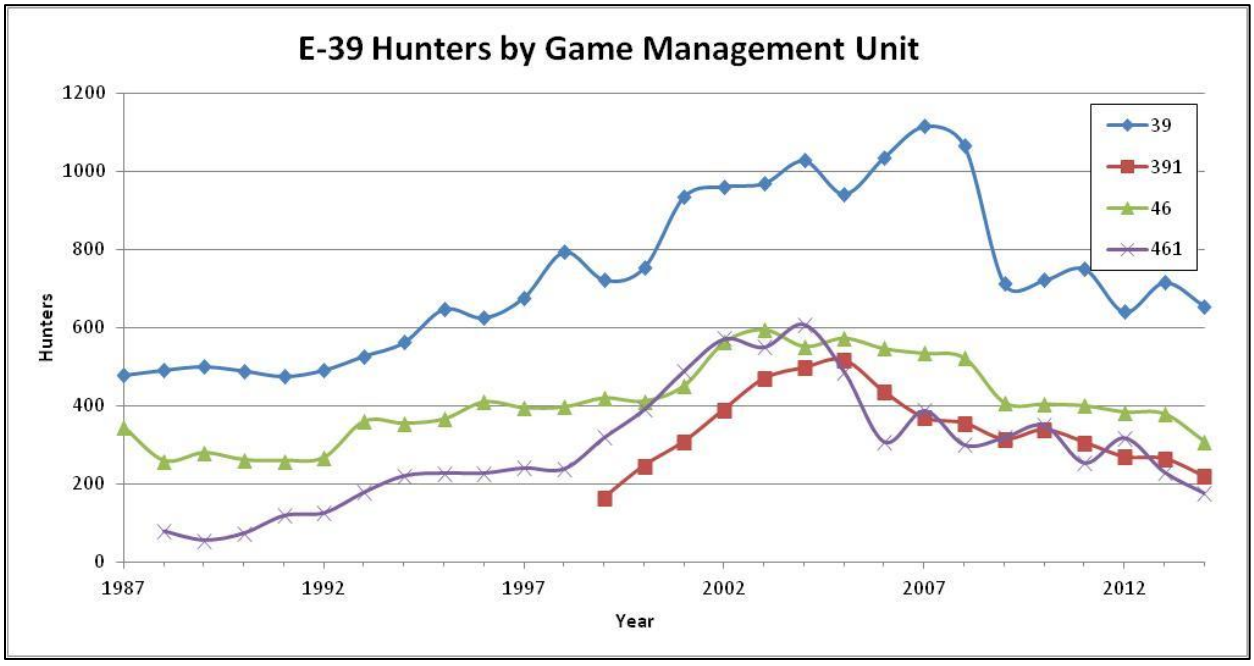


Figure 19: Total numbers of hunters in Game Management Units (GMU) 39, 391, 46, and 461 of the Mount Evans elk herd, Data Analysis Unit (DAU) E-39.

Success Rates

Success rates, calculated here as total harvest divided by the total number of hunters afield, in E-39 vary annually. However, success rates across all methods of take have been declining (Figure 20). The 25 year average annual success rate is 28%, with a high of 35% in 1988 and 1992, and a low of 21% in 2012. The PLO antlerless seasons have higher success rates than the regular rifle antlerless, archery, and antlerless muzzleloader seasons. The antlered muzzleloader and first rifle season have higher success rates than the other antlered rifle and archery seasons. Success rates in E-39 have an inverse relationship with the number of licenses available. As the number of available licenses increases, success rates decline (Figure 21).

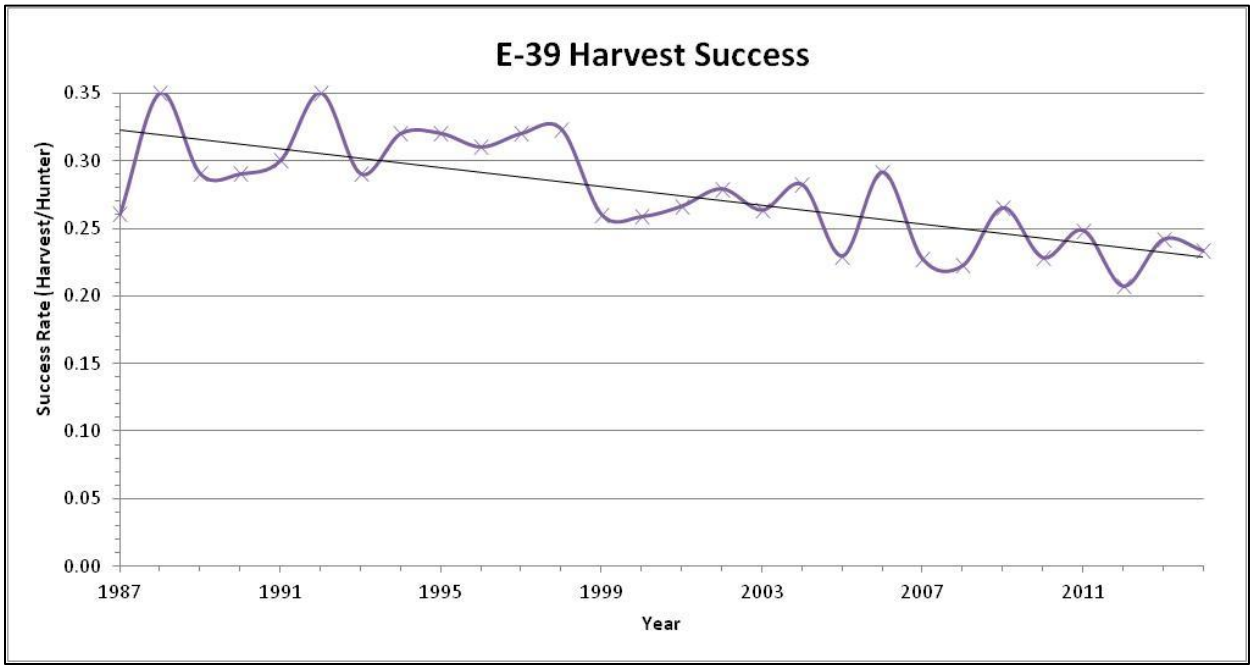


Figure 20: Harvest success (calculated as total harvest divided by the total number of hunters) with best fit line of the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, composed of Game Management Units (GMU) 39, 391, 46 and 461.

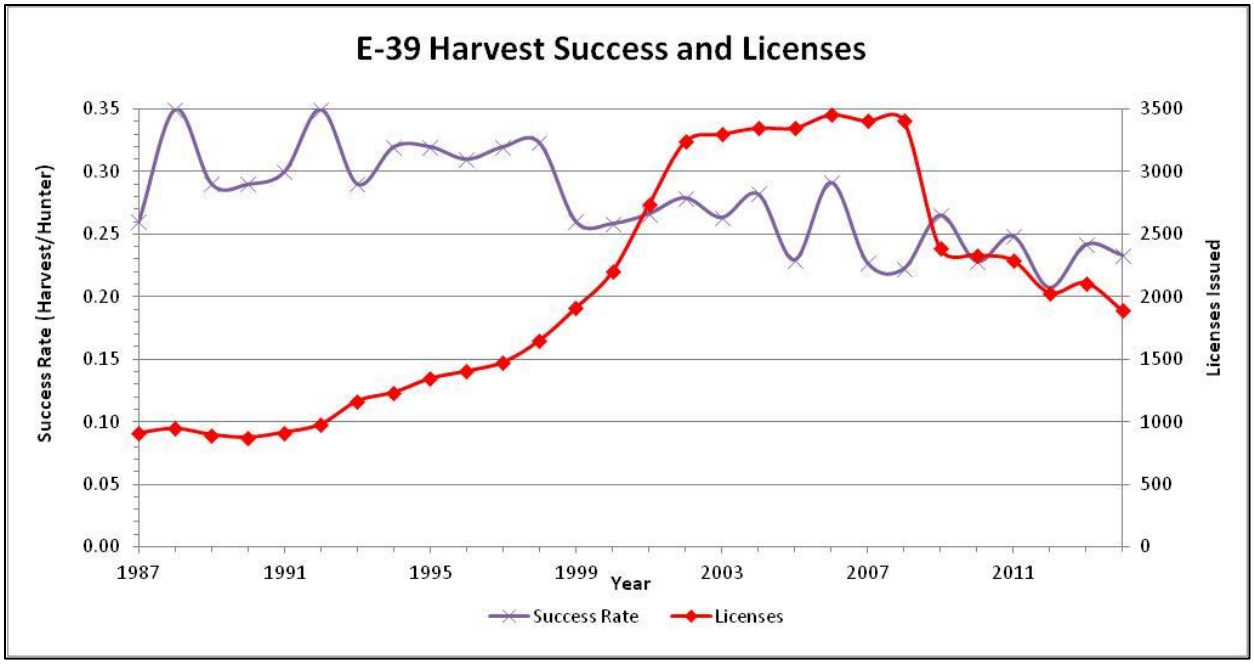


Figure 21: Harvest success (calculated as total harvest divided by the total number of hunters) and elk licenses available in the Mount Evans elk herd, Data Analysis Unit (DAU) E-39, composed of Game Management Units (GMU) 39, 391, 46 and 461.

Demand and Preference Points Required

Preference points are required to draw certain hunt codes in E-39. As with other hunt codes in the state, due to an increased demand for licenses, the overall trend in preference points is an increase in the number of preference points required to draw a license in those hunt codes requiring preference points (Table 11).

Access and Refuges

The USFS provides the greatest public land access for hunters. However, acquisition of private lands by city and county open space and parks has reduced hunting access to lands that were privately owned. Some city and county open space areas are now refuges for elk. Development of private open space into housing and subdivisions has also eliminated hunting access to areas that elk were historically hunted.

Economic Impact

Elk hunters provide monies to local economies in the area through the use of lodging services and the purchase of goods and services. However, elk are also an economic cost through landscape and agriculture damage, along with vehicle collisions.

Past Management Strategies

The Mount Evans elk herd has a long history of limited license allocation. Since at least 1986, neither over-the-counter licenses have been available, nor have antler point restrictions been utilized. In addition, late seasons have not been implemented

in E-39. Despite elk conflicts driving population objectives, it is very rare that special damage and dispersal type licenses are issued. For example, over the last 20 years, only 38 damage/special license types have been issued.

Table 11: The minimum number of preference points required for residents to draw a license in hunt codes requiring preference points in the Mount Evans elk herd, Data Analysis Unit (DAU E-39). E-39 is composed of Game Management Units (GMU) 39, 491, 46, and 461.

	Minimum Preference Points Required To Draw A License					
Year	39 Archery	39 Bull Muzzleloader	391 Bull Muzzleloader	46 Bull Muzzleloader	46 1st Season Rifle Cow	461 1st Season Rifle Cow
2014	1	2	0	2	0	0
2013	1	2	0	2	1	0
2012	1	2	0	2	1	0
2011	1	2	0	2	0	0
2010	1	1	0	1	0	0
2009	1	1	0	1	0	0
2008	1	0	0	1	0	0
2007	1	0	0	1	0	0
2006	0	1	0	0	0	0
2005	0	1	0	0	0	0
2004	1	1	1	0	0	1
2003	0	0	0	0	0	0

Historically, the Mount Evans elk herd was managed to provide quality bull elk hunting. Less bull licenses were available with the goal of producing large-antlered and old-aged males along with high success rates for bull hunters. The limited licenses and resultant high bull: cow ratio provided a quality hunting experience. A byproduct of the quality bull management was elk as watchable wildlife. Elk viewing occurred along the Mount Evans highway in summer and early fall, on several city and county open space and parks properties in the fall and winter, and on private land by local residents. During the 1998 herd management planning process, there was a majority consensus among residents and managing agencies to manage the herd for quality bulls, while maintaining the size of the herd (Chase and George 1998). However, the elk herd began to grow and as it increased the quality bull management strategy began to shift towards more of an opportunity bull hunting strategy.

Elk numbers increased throughout the DAU (Figure 12), but most significantly in the eastern portion of the DAU, which is private land and city and county open space and parks (Figure 8). Most private landowners, owning 2 to 35 acre parcels, and all Denver Mountain Parks and Jefferson County Open Space within E-39, did not allow

hunting due to safety concerns. Refuges, created by those hunting and access restrictions, created areas with high elk concentrations. Many elk using the eastern areas of the DAU stopped migrating and resided in those areas on a year-round basis. At the same time, the human population size in the DAU increased and additional elk habitat was developed. It was thought that overall distribution of elk shifted towards the eastern areas of DAU. The above circumstances led to increased conflicts between elk and people. Conflicts included elk-vehicle collisions, complaints of elk damage to landscaping and native vegetation, fence damage, and game damage complaints on growing and stored hay crops. The areas that experienced the most extensive elk conflicts were those areas that restricted hunter access.

In order to reduce elk conflicts, more licenses and license types (for both bulls and cows) became available to hunters to reduce the herd size and redistribute elk. Antlerless private-land-only (PLO) seasons were implemented with the specific goals of shifting elk from private lands experiencing conflicts to public land, along with shifting elk distribution from the eastern GMUs (391 and 461) onto the public land in GMUs 39 and 46. The first PLO season was implemented in GMU 461 in 1994. Later, PLO seasons were added to GMUs 39, 46, and 391 in 1995, 1999, and 1999, respectively. The PLO seasons have been effective at increasing harvest and shown some success in redistributing elk from certain conflict areas, but those seasons have shown marginal success in redistributing elk from unincorporated subdivisions (e.g., Evergreen and Genesee). The antlerless PLO seasons have proven a valuable management tool and now make up a large proportion of licenses and harvest in the DAU. The PLO licenses in GMUs 391 and 461 are List C, meaning a single hunter can purchase as many of those license types as desired until the total license quota in that season has been reached. To provide additional harvest and hunting opportunity, 4th seasons were implemented on a DAU-wide basis in 2000.

In addition to reducing elk conflicts, the new opportunity-hunting management strategy allowed more hunters to draw licenses and hunt more frequently. Although all licensing remained limited, the management shift and herd reduction efforts in the 2000s decreased the total number of elk in the herd (Figure 12), along with the number of quality bulls on the landscape, and reduced hunter success rates (Figure 21). Several concerns developed during this shift in management strategy. In addition to the resident elk herd segments, which are often recognized as associated with conflicts, there are migratory herd segments that use USFS land. The migratory elk provide hunting and watchable wildlife opportunities on Mount Evans and other USFS and CPW properties. There was concern that increases in regular rifle licenses, to reduce resident elk segments, would also result in a reduction of the migratory herd segments. There was also concern that PLO licenses, which are intended to prevent overharvest on public land, were being filled on migratory elk using winter

range located on private land adjacent to USFS land. There has been a large resident herd in the Evergreen area for many years. Elk conflicts still exist in areas of Evergreen where hunting is often restricted, or not feasible, and land management strategies create refuges.

In order to more accurately reflect the working definition of a DAU (i.e., population closure), achieve harvest goals in a more precise geographic manner, reduce hunter crowding, and reduce elk damage, GMUs and GMU boundaries have been amended in E-39 on several occasions. Prior to 1988, the Mount Evans elk herd was composed of GMUs 39 and 46. Game management unit 39 was made up of the area that is now GMUs 39 and 391, while GMU 46 was made up of the area that is now GMU 46 and 461. In 1988, the GMU 46 boundary was redrawn to form GMUs 46 and 461. The new GMU 46 was created in the west and new GMU 461 in the east. In 1989, GMUs 51 and 104 were added to the DAU, but later removed from the DAU in 1997. In 1999, GMU 39 was divided east and west into GMUs 39 and 391, respectively, to form the current GMU configuration of the DAU (Figure 2).

CURRENT HERD MANAGEMENT

Population and Herd Composition Ranges

Previous Post-hunt Objectives (Pre 1998)
Population Size – 2,200
Sex Ratio – 35 bulls: 100 cows

Previous Post-hunt Objectives (1998 to 2015)
Population Size – 2,500
Sex Ratio – 45 bulls: 100 cows

Current Post-hunt Population Estimates (2014)
Population Size (Modeled) – 2,100
Sex Ratio (Modeled) – 38 bulls: 100 cows

Current Objectives (2016)
Population Size Range – 2,200-2,600
Sex Ratio Range – 30-40 bulls: 100 cows

Current Management Issues and Strategies

Many of the issues and strategies identified in the 1998 herd management plan (George 1998) are still relevant today. However, CPW's recent management was primarily focused on resolving elk–related conflicts and providing hunting opportunities, as opposed to providing quality bull hunting opportunities. The greater Evergreen area is still experiencing the greatest number of conflicts, but overall conflicts have declined. Colorado Parks and Wildlife will continue to provide

education to residents regarding living with elk and other wildlife to ameliorate conflicts.

Obtaining harvest in some areas that experience the most conflicts remains a challenge. A relatively large area of the DAU is open space, parks, and unincorporated subdivisions, all of which provide elk refuges from hunters. This situation creates two problems: 1) high elk concentrations and associated elk conflicts and 2) refuges where hunting cannot be used to manage elk distribution and population objectives. Ironically, some hunters are commenting on the lack of elk on public land and reduced hunter success, while residents in unincorporated subdivisions are complaining of too many elk. Hunting is still not allowed on large tracts of public land administered by Jefferson County and the city and county of Denver, where elk often concentrate in large numbers. Colorado Parks and Wildlife will continue to explore opportunities to allow hunting on additional lands, which act as refuges for elk.

As mentioned earlier, achieving and maintaining a desirable distribution of elk in E-39 is challenging, but CPW will continue to use PLO licenses to improve elk distribution by shifting elk use from private land to public land. To improve elk distribution around the greater Evergreen area, a new boundary for the 391 PLO hunt code will be considered. The new hunt boundary will include all private land within GMU 391 and private land within the Jefferson County portion of GMU 39. In order to improve the bull hunting experience, CPW will also consider removing the 1st season rifle antlerless license, or reducing those licenses, to improve hunter densities for early rifle bull hunters.

Habitat loss, fragmentation, and degradation (resulting from development) continue to be an issue for elk in the area. Many valleys and low elevation areas, that were once elk winter range and transitional range, have been developed and are no longer considered suitable as elk habitat. Because of the high monetary value of land in the DAU, along with a decline in the livestock industry, there is great financial incentive for landowners to subdivide and develop into residential housing. In addition, conservation easements are difficult to secure because of the high land values. With only a small percentage of elk winter range on private land that is protected with conservation easements, the need for conserving the remaining habitat on both private and public lands is vital. In an attempt to minimize the effects of development, CPW will seek to work with partners to secure conservation easements. Furthermore, CPW is conducting habitat improvement projects on Mount Evans and Bergen Peak State Wildlife Areas.

The Mount Evans elk herd continues to provide watchable wildlife opportunities on Mount Evans, open space, in and around Evergreen, and some private lands.

However, outdoor recreation including hiking, dog-walking, skiing, mountain biking, ATV riding, jeep touring, dirt-biking, and snowmobiling has increased tremendously. Recreational activities are occurring throughout all elk seasonal ranges, particularly on winter and transitional ranges and during critical periods of winter and calving. Recreational use has expanded into year-round activities and is especially extensive on USFS land. Recent mild winters have increased recreational access into areas later into the fall and earlier in the spring.

This heightened level of human activity on the landscape is a major disturbance to elk and other wildlife that can ultimately lead to reduced fitness (i.e., survival and reproduction). For example, elk increased their travel time and decreased their foraging time in response to off-road recreation activity, with ATV-riding producing the greatest change in behavior, followed by mountain biking, hiking, and horseback-riding (Naylor et al. 2009). Summer calf ratios declined in response to experimental disturbance in the form of recreational hiking (Phillips and Alldredge 2000), but recovered to control levels in subsequent years when human disturbance was experimentally removed (Shively et al. 2005). Dogs both on- and off-leash also contribute to the harassment and mortality of wildlife (e.g., Miller et al. 2001 for mule deer). These behavioral stressors and additional mortality can reduce recruitment of calves into the population directly by limiting calf survival, as well as indirectly by displacing elk from preferred feeding and bedding areas.

There is increasing demand for more recreational trails, as well as frequent use and expansion of unofficial trails, all of which will impinge upon wildlife habitat. With human and wildlife activities competing for the same land, if wildlife are to be adequately protected, then wildlife conservation must be a factor and consideration in land use planning. Measures to minimize the negative impacts of outdoor recreation on wildlife, including timing restrictions and regulation of certain activities, need to be enforced. This is especially true for critical periods affecting elk and deer survival (winter through calving/fawning).

The level of outdoor recreation has also led to competition among photographers, ATV riders, mountain bikers, dirt bikers, and hunters in the fall for use of public lands. Complaints are becoming more common from hunters about other recreationists disturbing elk and deer due to noise and an increase in numbers of people using the landscape. Colorado Parks and Wildlife hopes to decrease the negative impacts of outdoor recreation on wildlife and improve the consumptive use experience by seasonally limiting access to the Mount Evans State Wildlife Area to people that possess valid hunting or fishing licenses.

Hunter numbers in the DAU will continue to be controlled with limited licensing. Archery, muzzleloader, rifle, and PLO licenses will be issued to meet herd objectives and provide hunting opportunities.

Chronic Wasting Disease

Chronic wasting disease has been detected in GMUs 39, 391, and 461, but not GMU 46. The estimated annual CWD prevalence rates for the DAU, which is based upon hunter harvest, is very low for the years the DAU has been sampled, 2002 – 2013 (Figure 22). The highest detected annual prevalence rate, based upon elk 2 years old or greater that were harvested by hunters, was only 3.4%. However, sample size has been low for all years sampled. Sample size has been very low from 2008 to 2013, so low that those estimates may not be informative.

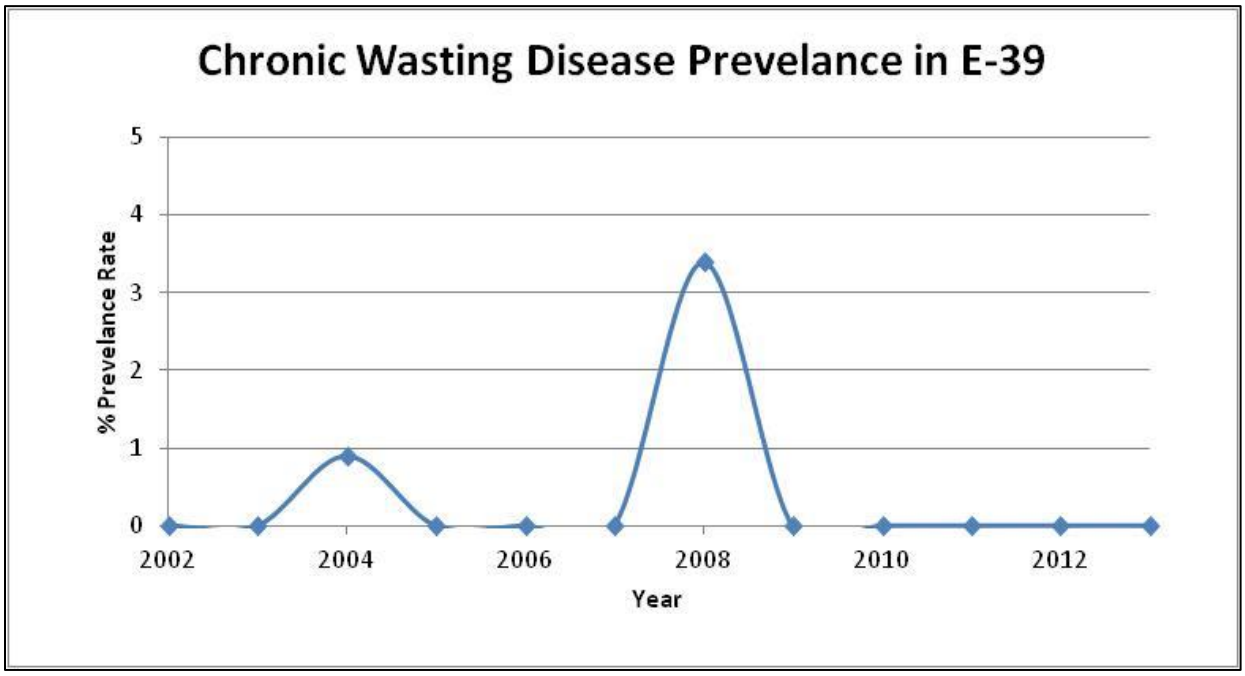


Figure 22: Annual chronic wasting disease (CWD) prevalence rate estimates of the Mount Evans elk herd, Data Analysis Unit (DAU) E-39. Prevalence estimates are based upon hunter submitted elk ≥ 2 years old. E-39 is composed of Game Management Units (GMU) 39, 391, 46, and 461.

PUBLIC INVOLVEMENT

Public input into the management of the Mount Evans elk herd was solicited through three public open houses, a survey, and draft comment period. The open houses were announced by CPW through various media outlets, via press release, and announced on the CPW website. The open houses were held in Bailey, Dumont, and Evergreen on November 18th, 19th, and 20th 2013, respectively. The format of the open houses was to exhibit information on the herd, answer questions from the

public, and have the participants complete a survey regarding management of the Mount Evans elk herd (Appendix C). Just over 40 people attended the Bailey open house, 1 person attended the Dumont open house, and 42 people attended the Evergreen open house.

In addition to the open houses, the survey was also available to the public on the CPW website from December 1st, 2013 to January 1st, 2014. The survey's availability and background information on the herd was announced with a press release by CPW announced on CPW's website. In addition, 1000 postcards soliciting the survey were randomly mailed to hunters that had applied for a license in the Mount Evans herd the three prior years. The postcards notified recipients that the information packet and the survey were available on the CPW website. The postcards also notified recipients that they could contact the wildlife biologist to have paper surveys and information packets mailed to them. Twenty-six postcards were returned to CPW as undeliverable. In total, 382 respondents completed the survey.

Public input from the survey was then incorporated into a draft management plan that was posted on the CPW website and sent to local governments and land management agencies for review. Individuals, land management agencies, and local governments were then invited to submit comments on the draft herd management plan during a 30-day comment period which was held from January 22nd, 2015 to February 20th, 2015. Six citizens provided comments on the draft plan and three government or nongovernment organizations provided comments on the draft plan (Appendix D).

Summary of Public Input

Survey Results

The survey information packet, survey, and survey results are located Appendices B and C. Most survey respondents live in Colorado (93%) and well over one-half (64%) live in the herd management area. Most of the respondents living in E-39 have done so for a long time (mean = 19 years). The majority of survey respondents defined their interest in the herd as hunter (69%) or outdoor recreation not related to hunting (11%). The majority of respondents have hunted in E-39, most in GMU 39. An overwhelming majority enjoys the elk herd (99%), but some also worry about the problems associated with elk (38%), while few do not enjoy the elk (1%). Most people are at least moderately interested in viewing or photographing elk in the area.

The majority of respondents have not experienced elk related conflicts (65%), but some respondents have been involved in elk-vehicle collisions, or have had property damage to homes, businesses, and agriculture. Respondents are very concerned with habitat loss due to development and somewhat concerned with elk-vehicles collisions and revenue generated from tourism related to elk. The survey also showed that people have mixed feelings regarding the efficacy of CPW's management of the herd.

More people responded that they would like the elk population to increase than responded that they would like the population to stay the same or decrease (Appendix C, Questions 14-18). The exception is GMU 391, where respondents feel the population size should be maintained. The majority of respondents would like to see the bull: cow ratio and bull hunting opportunity remain the same, or to increase the bull: cow ratio and improve bull quality rather than decrease the bull: cow ratio and increase bull hunting opportunity (Appendix C, Questions 19-23).

The majority of respondents that have hunted in E-39 rate the overall hunting experience as good to fair (Appendix C, Question 30). They also rated the opportunity to harvest an elk for meat as fair (Appendix C, Question 31) and the opportunity to harvest a large-antlered bull as poor (Appendix C, Question 32). Hunter crowding does not appear to be an issue. Most hunters rated harvesting an elk as the most important factor to improve their hunting experience. Hunter crowding and the ability to hunt bulls every year were rated as the least important factors.

Consensus of agriculture producers in the DAU regarding the appropriate number of elk in the area seems to be mixed. In areas where sedentary resident elk herds occur in developed areas (e.g., Evergreen), some producers enjoy elk, while other producers feel there are too many elk. In areas where elk densities are low and have been historically higher, producers are concerned about the low number of elk currently on the landscape. Overall, it appears the elk herd is below the social carrying capacity of the DAU, but isolated areas have varied opinion and experience more elk-related conflicts.

Issue Identification

Several common issues emerged from general comments in the survey and discussions at the open houses. Common themes were:

- CPW should work to improve hunter access on private land and open space
- The State Wildlife Areas should be managed for sportsmen because other forms of outdoor recreation are outcompeting and detracting from consumptive uses
- Other forms of outdoor recreation are negatively impacting hunting on public land
- Special licenses should be issued for landowners in the DAU
- Desire for more elk on USFS and public land
- Increase bull quality to past levels
- Maintain bull hunting opportunity
- Too many elk in populated areas
- Too few elk compared to the past
- Elk numbers declining in GMUs 46 and 461
- Concerns of elk-vehicle collisions and the need to mitigate roadways
- More CPW involvement with development and land management

Previous work regarding public opinion on the management of the Mount Evans elk herd indicated that respondents were satisfied with the number of elk on the landscape and desired a quality bull management strategy at that time (Chase et al. 2002, George 1998). In contrast to those results, the 2013 survey conducted by CPW found that most respondents prefer more elk and are satisfied with the current level of bull quality and bull hunting opportunity (Public Involvement Section and Appendix B). However, the 2013 CPW survey participant composition may have been different than the Chase et al. study. It's likely that a higher proportion of hunters participated in the 2013 CPW survey and hunters generally desire more animals. A message that carries over from the 1998 survey is the public's desire for CPW to work with developers and land managers to conserve elk habitat and maintain the elk population within carrying capacity.

Comments on Draft Plan during the 30 Day Comment Period

Three citizens provided comment letters (Appendix D) and three citizens telephoned the wildlife biologist to comment on the draft herd management plan. Two common concerns emerged from those comments. The first concern was the distribution of elk within the DAU. Respondents voiced concerns about the lack of elk on public land open to hunting (e.g., USFS land) and the high abundance of elk using refuge areas that restrict hunting or where hunting is not feasible. The second concern voiced was the declining number of mature bulls on the landscape and the declining bull: cow ratio.

The USFS Clear Creek and South Platte Ranger Districts also provided comments during the draft comment period. Both Ranger Districts expressed support for the selected population and bull: cow ratio alternative objective ranges proposed by CPW. In addition to striving to manage the diverse and growing recreational demands on USFS lands, both Ranger Districts also expressed intent to continue forest restoration work and wildlife habitat improvements.

The South Park Habitat Partnership Program Committee also provided comments on the draft. The committee supported CPW's preferred alternative objective ranges. In addition, the committee also felt that Staunton State Park was capable of providing limited public big game hunting opportunities.

MANAGEMENT ALTERNATIVES AND SELECTED OBJECTIVES

When revising a herd management plan, the development of the alternative objectives relies heavily on the model estimates. Population modeling is an evolving process whereby modeled estimates can change over time because of additional data or improved modeling methodology. Therefore, when modeled estimates change

irrespective of an actual change in the population, it is reasonable to adjust or index population objectives relative to the new modeled estimates. The basis of harvest-based population management is to increase female harvest when a population exceeds objective, decrease female harvest when a population is below objective, and maintain female harvest when a population is at objective. Concurrently, male and female harvest is adjusted to achieve the sex ratio objective. Because herd objectives are only meaningful in the relative context of the model estimates available at the time the objectives were established, indexing maintains the integrity of the objectives based on the fundamental criteria of whether there are too many, too few, or the desired number of animals in the population. Therefore, as we improve modeled population estimates, it is important to adjust or index the population objectives, but not necessarily harvest objectives. Currently, when a herd management plan is revised a new suite of models is run and the best model(s) are selected, which frequently results in some degree of indexing.

Population Objective Alternatives

The previous population objective, expressed as a point objective, was 2,500 elk. Population objectives are now ranges, in recognition of the complexity of precisely estimating and managing populations and the variation inherent in carrying capacity due to changes in climate, land management, and habitat (e.g., fires, winter weather events, droughts, land swaps, forest management, and development). The intention is to manage for a target within the selected objective range. For the past decade, this population has been managed to decrease the population down towards the previous population objective. More recently, the population has been estimated below the objective and license availability has declined. All three alternatives listed below are within the biological and social carrying capacity of the herd.

Alternative 1: 1,800 – 2,200 elk post season

This alternative is 28% to 12% lower than the previous population objective. A more aggressive harvest strategy would be required to achieve this alternative. It's likely that more licenses, longer and possibly more seasons, and hunting access to more private land and open space in the eastern half of the DAU would be required. Acquiring enough access to those refuges may be challenging. Given the current land management juxtaposition in the DAU, it is doubtful that a reduction of this magnitude could be achieved through hunting alone. Culling elk, with sharpshooters, may be necessary to help achieve this alternative. However, increased hunting is expected to significantly reduce elk densities on public lands where hunting is allowed, while only slightly reducing densities on refuges, where hunting is not allowed.

A reduction of this magnitude in elk numbers may decrease human-elk conflicts. However, the required increased hunting pressure may also displace elk from public land, resulting in proportionally more of the elk herd using private land and refuges throughout the herd management area. In addition, the low numbers of elk on public land would result in a large decrease in satisfaction of both hunters and wildlife viewers. If this alternative is selected there will be a need to expand hunting opportunities into refuge areas to balance harvest with elk densities. In addition, elk may actually use refuges for longer periods of time because of the increased hunting pressure. In the short-term, license sales and elk harvest would increase. However, in the long-term, this alternative would result in the fewest elk harvested and the fewest licenses available.

Alternative 2: 2,200 – 2,600 elk post season

The previous population objective lies within this alternative range. However, this alternative range also encompasses a 12% reduction to a 4% increase from the previous population objective. This alternative will result in elk hunting, elk harvest, elk viewing opportunities, and human-elk conflicts similar to the previous population objective. There will continue to be some damage in some areas with this alternative, but means other than population reduction could be used to address these problems. New proposed management strategies may decrease elk conflicts without the need to adjust population size (see Current Management Issues and Strategies). However, as the human population continues to grow, there may be more elk damage and conflicts. Under this alternative, it is advisable to pursue more hunting opportunities in the eastern half of the DAU on private land and parks and open space to reduce elk conflicts and achieve a better distribution of elk. Commerce in the area related to elk hunting and elk viewing will likely remain stable. This alternative will result in licenses available and elk harvest in the future, similar to what is currently experienced.

Alternative 3: 2,600 – 3,000 elk post season

This alternative is 4% to 20% higher than the previous population objective. This alternative would provide the largest elk harvest, license availability, greatest elk hunting opportunity, and the greatest satisfaction in elk viewing. However, this alternative would likely result in the greatest number of elk conflicts. Damage to agricultural operations may become more prevalent and elk-vehicle collisions may increase, all of which may be exacerbated as the human population increases in the area. Commerce in the area related to elk hunting and elk viewing may increase. This alternative would result in fewer licenses available in the short term, but the most licenses available and greatest elk harvest in the long term.

Herd Composition (Sex Ratio) Objective Alternatives

The previous sex ratio objective was expressed as a point objective at 45 bulls: 100 cows. Similar to the population objective, sex ratio objectives are now ranges in recognition of the difficulties of precisely estimating and managing populations. The intention is to manage for a target within the selected objective range, while allowing some flexibility to respond to the variation inherent in carrying capacity due to changes in climate patterns, land management, and habitat (e.g., fires, winter weather events, droughts, land swaps, forest management, and development). All three proposed alternatives (below) allow sufficient bulls for breeding purposes. For the past decade, the sex ratio in this population has been driven down in order to move towards the population objective.

Alternative 1: 20 – 30 Bulls: 100 Cows

This alternative is a 55% to 33% reduction from the previous objective. For a given population size, this alternative would result in the greatest number of bull licenses available in the future and most bull hunting opportunity. However, the quality of bull hunting would decrease as this alternative would result in the fewest bulls on the landscape. Hunters would experience more hunters afield, see fewer bulls, and harvest younger and smaller bulls compared to Alternatives 2 and 3. This alternative would also result in the least opportunity for bull viewing.

For a given population size, a decrease in the number of bulls would require an increase in the number of cows to maintain the population objective. This would result in an elk herd with higher reproductive potential.

Alternative 2: 30 – 40 Bulls: 100 Cows

This alternative is a 33% to 11% reduction from the previous objective. This alternative will slightly increase the bull hunting opportunity as more bulls would need to be harvested. Compared to the other 2 alternatives, this alternative will result in an intermediate level of bull hunting opportunity, bull viewing opportunity, and bull age structure. For a given population size, this alternative will result in more bull licenses available in the short- and long-term, compared to what is currently available.

Alternative 3: 40 – 50 Bulls: 100 Cows

The previous objective was within this alternative range and will result in an 11% reduction to an 11% increase from the previous objective. This alternative is the best strategy for quality bull hunting and elk viewing opportunities, as this alternative would produce the most mature bulls on the landscape. It also has the least opportunity for bull hunting. It would take longer to draw a bull license, but hunters could expect to see more bulls and fewer hunters afield compared to the previous two

alternatives. This alternative would likely maintain tourism related to elk viewing, such as viewing rutting behavior in Elk Meadows. Because the previous objective is within this alternative range, this alternative would have little fiscal impact on local business. For a given population size, this alternative would result in the fewest bull licenses available in the future.

New Objectives

Population Alternative: 2,200 – 2,600 elk:

This alternative will result in elk hunting, harvest, viewing opportunities, elk-related commerce, and conflicts similar to what is currently experienced. This alternative was selected because public outreach indicated that the public wants to maintain or slightly increase the current number of elk in the DAU. This alternative is below the biological carrying capacity and it is likely that social factors may limit increases to the population size.

Herd Composition Alternative: 30 – 40 bulls: 100 cows:

This alternative was selected because it provides intermediate levels of bull hunting opportunity, bull viewing opportunity, and bulls on the landscape. In addition, there is potential that conflicts related to bulls, especially in residential areas, may be reduced from what is currently experienced.

The existing season structure and the limited license strategy will be employed to move towards and stay within the new objectives' ranges. Archery and muzzleloader license allocation will continue to focus on hunting recreation, while rifle and PLO licenses will be used to manage population demographics and distribution. The CPW management strategy will rely on PLO licenses to decrease elk numbers and reduce conflicts in the eastern portion of the DAU. The antlerless PLO season in GMU 391 will be expanded to encompass private lands within the Jefferson County portions of GMU 39 in order to increase harvest of and disperse the resident elk. License quotas will remain relatively limited in the western GMUs to encourage elk use of public lands. CPW will continue to work with the USFS to address elk-related habitat issues. Collaboration with city and county parks and open space regarding elk management is necessary to meet herd objectives, reduce conflicts, and eliminate refuge situations.

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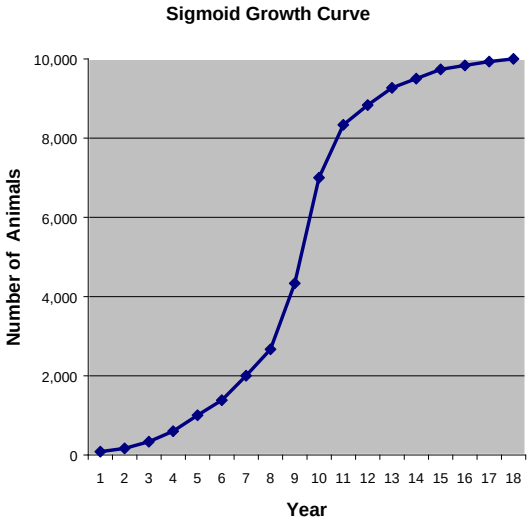
APPENDIX A: POPULATION DYNAMICS, MAXIMUM SUSTAINED YIELD, & DENSITY DEPENDENCE

Numerous studies of animal populations, including such species as bacteria, mice, rabbits, and white-tailed deer have shown that the populations grow in a mathematical relationship referred to as the "sigmoid growth curve" (right). There are three distinct phases to this cycle. The first phase occurs while the population level is still very low and is characterized by a slow growth rate and a high mortality rate. This occurs because the populations may have too few animals and the loss of even a few to predation or accidents can significantly affect population growth.



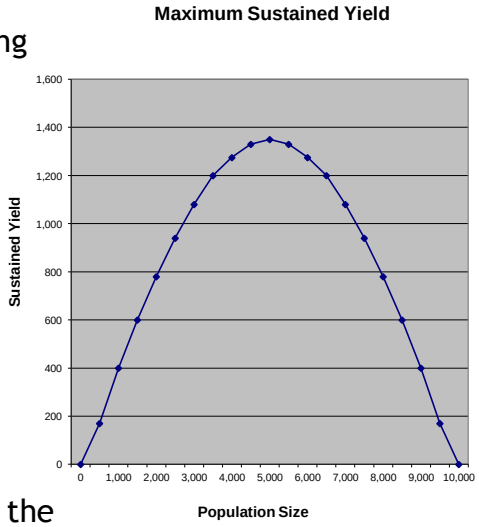
The second phase occurs when the population number is at a moderate level. This phase is characterized by high reproductive and survival rates. During this phase, food, cover, water and space are not a limiting factor. During this phase, animals such as white-tailed deer have been known to successfully breed at six months of age and produce a live fawn on their first birthday and older does have been known to produce 3-4 fawns that are very robust and healthy. Survival rates of all sex and age classes are also at maximum rates during this phase.

The final or third phase occurs when the habitat becomes too crowded or habitat conditions become less favorable. During this phase the quantity and quality of food, water, cover and space become scarce due to the competition with other members of the population. These types of factors that increasingly limit productivity and survival at higher population densities are known as density-dependent effects. During this phase, for example, white-tailed deer fawns can no longer find enough food to grow to achieve a critical minimum weight that allows them to reproduce; adult does will usually only produce 1-3 fawns; and survival of all deer (bucks, does and fawns) will decrease. During severe winters, large die-offs can occur due to the crowding and lack of food. The first to die during these situations are fawns, then bucks, followed by adult does. Severe winters affect future buck: doe ratios by favoring more does and fewer bucks in the population. Also, because the quality of a buck's antlers is somewhat dependent upon the quantity and quality of his diet, antlers

development may be diminished. If the population continues to grow, it will eventually reach a point called "K" or the maximum carrying capacity. At this point, the population reaches an "equilibrium" with the habitat. The number of births each year equals the number of deaths; therefore, to maintain the population at this level would not allow for any "huntable surplus." The animals in the population would be in relatively poor body condition, habitat condition would be degraded from over-use, and when a severe winter or other catastrophic event occurs, a large die-off is inevitable.

What does all this mean to the management of Colorado's big game herds? It means that if we attempt to manage for healthy big game herds that are being limited by density-dependent effects, we should attempt to hold the populations more towards the middle of the "sigmoid growth curve." Biologists call this point of inflection of the sigmoid growth curve the point of "MSY" or "maximum sustained yield." In the example below, MSY, which is approximately half the maximum population size or "K", would be 5,000 animals. At this level, the population should provide the maximum production, survival, and available surplus animals for hunter harvest. Also, at this level, range habitat condition should be good to excellent and range trend should be stable to improving. Game damage problems should be lower and economic return to the local and state economy should be higher. This population level should produce a "win - win" situation to balance sportsmen and private landowner concerns.

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



Actually managing deer and elk populations for MSY on a DAU basis is difficult, if not impossible, due to the amount of detailed biological information about habitat and population size required. Additionally, carrying capacity is not static, the complex and dynamic nature of the environment causes carrying capacity to vary seasonally, annually, and trend over time. In most cases we would not desire true MSY management even if possible because of the potential for overharvest and the number of mature of bulls and bucks is minimized because harvest reduces recruitment to older age classes. However, the concept of MSY is useful for understanding how reducing densities and pushing asymptotic populations towards the inflection point can stimulate productivity and increase harvest yields. Knowing the exact point of MSY is not necessary if the goal is to conservatively reduce population size to increase yield. Long-term harvest data can be used to gauge the effectiveness of reduced population size on harvest yield.

Research in several studies in Colorado has shown that density-dependent winter fawn survival is the mechanism that limits mule deer population size because winter forage is limiting (Bartmann et al. 1992, Bishop et al. 2009). Adult doe survival and reproduction remain high, but winter fawn survival is lower at higher population sizes relative to what the winter habitat can support. The intuition to restrict, or even eliminate, female harvest in populations where productivity is low and when populations are below DAU plan objectives is counterproductive and creates a management paradox. In that, for populations limited by density dependent processes, this "hands-off" type of management simply exacerbates and perpetuates the problem of the population being resource limited, and countermands the goals and objectives of the DAU plan. As Bartmann et al. (1992) suggest, because of density-dependent processes, it would be counterproductive to reduce female harvest when juvenile survival is low and increase harvest when survival is high. Instead, a moderate level of female harvest helps to maintain the population below habitat carrying capacity and should result in improved survival and recruitment of fawns. Increased fawn recruitment allows for more buck hunting opportunity and a more resilient population.

Thus, the key for DAU planning and management by objective is to set population objectives in line with what the limiting habitat attributes can support. A population objective range aptly set, must be below carrying capacity.

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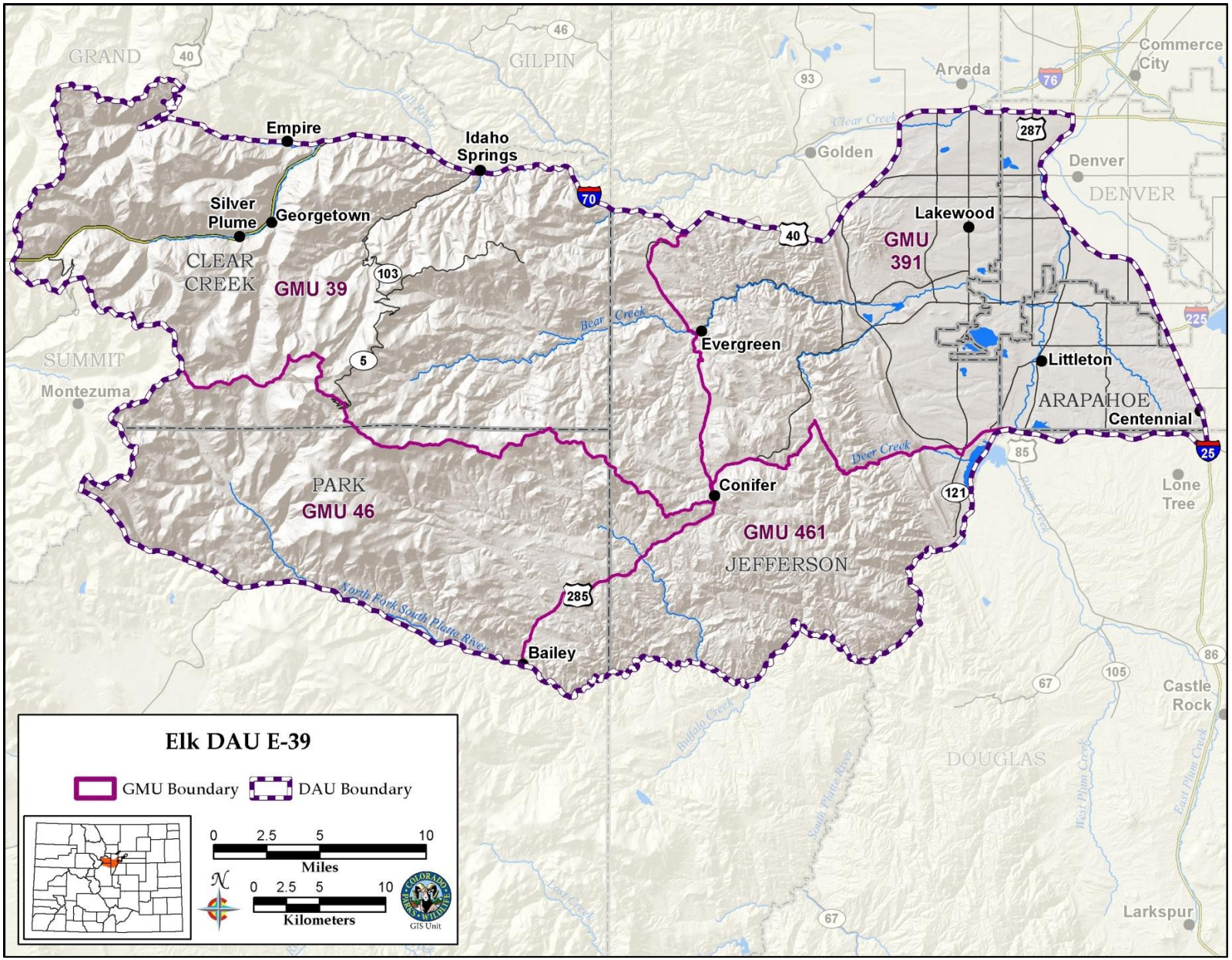
APPENDIX B: INFORMATION PACKET FOR SURVEY

E-39 Mount Evans Elk Herd

In Colorado, big game species are managed at the herd level. The management of each herd is guided by a herd management plan. Herd management plans describe herd population and management histories, population objectives, and management strategies for a minimum of 10 years. The herd management planning process is a way to incorporate the concerns and desires of the public with the biological capabilities of big game herds. Public input is a very important part of the herd management planning process.

Background

The Mount Evans elk herd, E39, is located in central Colorado in portions of Arapahoe, Clear Creek, Douglas, Denver, Jefferson, and Park counties. The herd consists of Game Management Units (GMUs) 39, 46, 391, and 461. The herd is bounded on north by Continental Divide, U.S. 40, and I-70; on east by I-25 and South Platte River; on south by North Fork of the South Platte River and U.S. 285; on west by North Fork of South Platte River and Continental Divide. Municipalities include Bailey, Bergen Park, Conifer, Denver and surrounding metro areas, Evergreen, Georgetown, Idaho Springs, and Morrison. Much of the area in the eastern portion of the herd management area contains metropolitan areas and unincorporated subdivisions, while the western portion contains public lands.


GRAND
GILPIN
CLEAR CREEK
SUMMIT
PARK
JEFFERSON
DOUGLAS
ARAPAHOE
Empire
Idaho Springs
Silver Plume
Georgetown
Montezuma
Golden
Arvada
Commerce City
Denver
DENVER
Lakewood
Evergreen
Littleton
Centennial
Conifer
Bailey
Lone Tree
Castle Rock
Larkspur
GMU 39
GMU 46
GMU 391
GMU 461
Clear Creek
Bear Creek
Deer Creek
North Fork South Platte River
Elk DAU E-39
GMU Boundary
DAU Boundary
0 2.5 5 10
Miles
0 2.5 5 10
Kilometers
GIS Unit

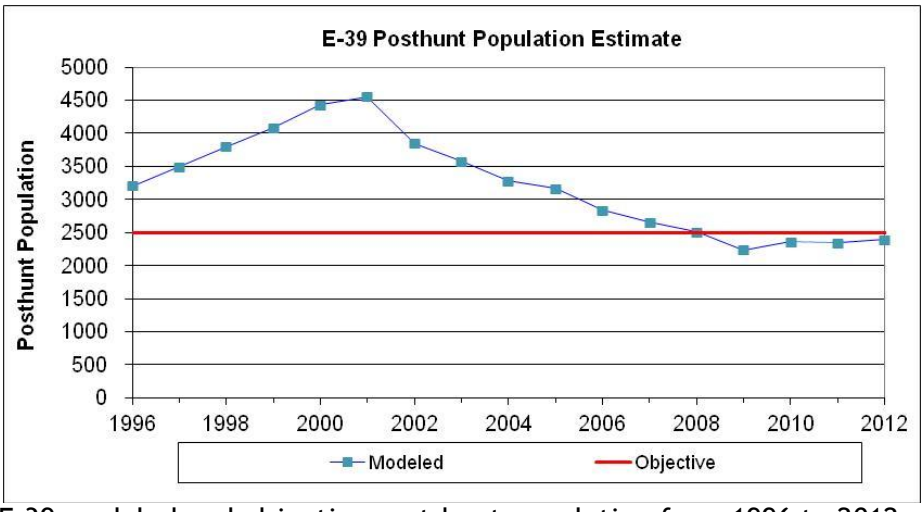
Objectives
Colorado Parks and Wildlife manages big game herds to provide the public with hunting and viewing opportunities, while minimizing conflicts and damage caused by the herd. In order to accomplish those goals, the total number of animals in the herd and the proportion of males in the herd are considered. Therefore, herd management plans define 1) a population objective and 2) a male to female ratio objective.

Population Objective: Colorado Parks and Wildlife strives to manage big game populations within both the biological and social carrying capacity of the herd. The biological carrying capacity is the number of animals that can be supported by the available habitat. The social carrying capacity is the number of animals tolerated by the people affected by the herd. When big game populations are at optimal levels, habitat damage is not a consideration, people are able to enjoy viewing, photographing, and hunting big game, and big game-human conflicts are minimized. If big game numbers are too low, it is difficult for viewers and hunters to find big game. If big game numbers are too high, habitat damage occurs and conflicts may rise to intolerable levels.

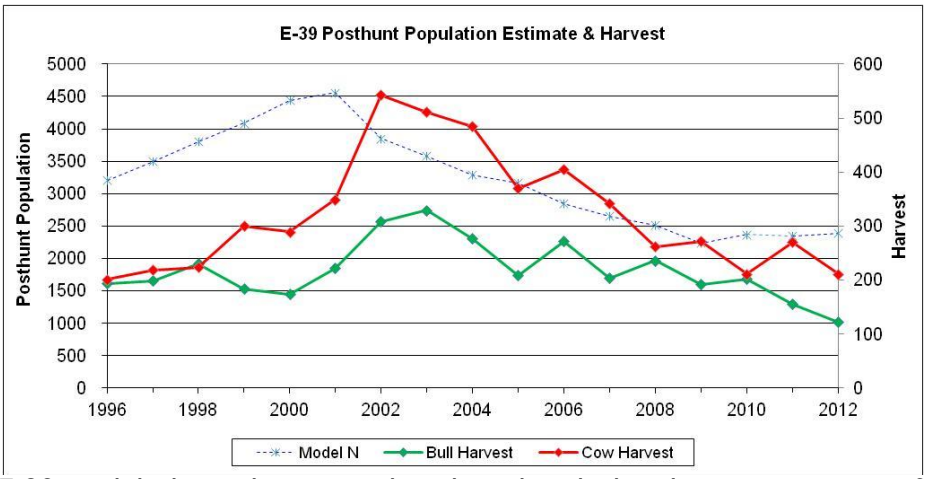
In order to increase big game populations, fewer licenses will be available in the short-term, but more licenses will become available each year in the long term. In order to decrease big game populations, more licenses will be available short-term, but fewer licenses will be available each year in the long-term.

Male to Female Ratio Objective: For a specific population size, there is a tradeoff between the number of male licenses available to hunters vs. the quality of males available to harvest. Big game herds can be managed to maximize 1) male hunting opportunity, 2) male quality (i.e., more males and older, larger males), or 2) some compromise between male hunting opportunity and male quality. For that specific population size, if the herd is managed to maximize male hunting opportunity, more male licenses are available and hunters are able to obtain male licenses more easily. This management strategy results in fewer males and fewer large old males in the herd. If the herd is managed to maximize the antler/body size of the males, fewer male licenses are issued each year. As a result, the average body/antler size of males harvested is greater and hunters will see more males while hunting, however, hunters may not be able to draw male licenses as frequently. Currently, the Mount Evans elk herd is managed for moderate levels of both male opportunity and male quality.

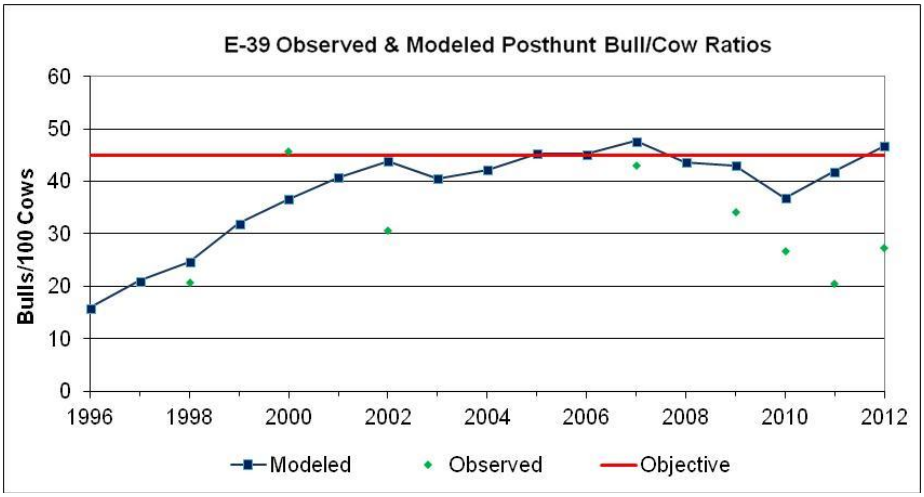
GMUs: 39, 391, 46, and 461
Post-hunt Population: Current Objective 2,500 2012 Model Estimate 2,390
Post-hunt Sex Ratio: Current Objective 45 bulls:100 cows 2012 Observed 27 bulls:100 cows
2012 Model Estimate 47 bulls:100 cows



E-39 modeled and objective post-hunt population from 1996 to 2012.



E-39 modeled population, antlered, and antlerless harvest estimates from 1996 to 2012.



E-39 modeled, observed and objective post-hunt sex ratios from 1996 to 2012.

Preference Points

The tables below display the minimum number of preference points required for residents to draw for the hunt codes in E-39 that require preference points. Hunt codes not listed do not require preference points.

	Hunt Code	
Year	EE039O1A	EM039O1M
2012	1	2
2011	1	2
2010	1	1
2009	1	1
2008	1	0
2007	1	0
2006	0	1
2005	0	1
2004	1	1
2003	0	0

	Hunt Code
Year	EF391O1M
2012	0
2011	0
2010	0
2009	0
2008	0
2007	0
2006	0
2005	0
2004	1
2003	0

	Hunt Code	
Year	EM046O1M	EM046O1R
2012	2	1
2011	2	0
2010	1	0
2009	1	0
2008	1	0
2007	1	0
2006	0	0
2005	0	0
2004	0	0
2003	0	0

	Hunt Code
Year	EF461O1R
2012	0
2011	0
2010	0
2009	0
2008	0
2007	0
2006	0
2005	0
2004	1
2003	0

Current Seasons

GMU	HUNT CODE	Method	2013 Season Dates	Season Length (Days)
039	EE039O1A	Archery	Aug. 31-Sep. 29	30
039	EF039O1M	Muzzleloader	Sep. 14-22	9
039	EF039O1R	Any Method	Oct. 12-16	5
039	EF039O2R	Any Method	Oct. 19-27	9
039	EF039O3R	Any Method	Nov. 2-10	9
039	EF039O4R	Any Method	Nov. 13-17	5
039	EF039P5R	Any Method	Sep. 1-Jan. 31	153
039	EM039O1M	Muzzleloader	Sept. 14-22	9
039	EM039O1R	Any Method	Oct. 12-16	5
039	EM039O2R	Any Method	Oct. 19-27	9
039	EM039O3R	Any Method	Nov. 2-10	9
039	EM039O4R	Any Method	Nov. 13-17	5
046	EE046O1A	Archery	Aug. 31-Sep. 29	30
046	EF046O1M	Muzzleloader	Sept. 14-22	9
046	EF046O1R	Any Method	Oct. 12-16	5
046	EF046O2R	Any Method	Oct. 19-27	9
046	EF046O3R	Any Method	Nov. 2-10	9
046	EF046O4R	Any Method	Nov. 13-17	5
046	EF046P5R	Any Method	Sep. 1-Jan. 31	153
046	EM046O1M	Muzzleloader	Sept. 14-22	9
046	EM046O1R	Any Method	Oct. 12-16	5
046	EM046O2R	Any Method	Oct. 19-27	9
046	EM046O3R	Any Method	Nov. 2-10	9
046	EM046O4R	Any Method	Nov. 13-17	5
391	EE391O1A	Archery	Aug. 31-Sep. 29	30
391	EF391O1M	Muzzleloader	Sept. 14-22	9
391	EF391P5R	Any Method	Sep. 1-Jan. 31	153
391	EM391O1M	Muzzleloader	Sept. 14-22	9
391	EM391O1R	Any Method	Oct. 12-16	5
391	EM391O2R	Any Method	Oct. 19-27	9
391	EM391O3R	Any Method	Nov. 2-10	9
391	EM391O4R	Any Method	Nov. 13-17	5
461	EE461O1A	Archery	Aug. 31-Sep. 29	153
461	EF461O1M	Muzzleloader	Sept. 14-22	9
461	EF461O1R	Any Method	Oct. 12-16	5
461	EF461O2R	Any Method	Oct. 19-27	9
461	EF461O3R	Any Method	Nov. 2-10	9
461	EF461O4R	Any Method	Nov. 13-17	5
461	EF461P5R	Any Method	Sep. 1-Jan. 31	153
461	EM461O1M	Muzzleloader	Sept. 14-22	9

GMU	HUNT CODE	Method	2013 Season Dates	Season Length (Days)
461	EM461O1R	Any Method	Oct. 12-16	5
461	EM461O2R	Any Method	Oct. 19-27	9
461	EM461O3R	Any Method	Nov. 2-10	9
461	EM461O4R	Any Method	Nov. 13-17	5

APPENDIX C: PUBLIC SURVEY

SOLICITATION FOR PUBLIC COMMENT ON ELK MANAGEMENT
The Mount Evans Elk Herd (E39)
(Game Management Units 39, 391, 46, and 461)

In Colorado, big game species are managed at the herd level. The management of each herd is guided by a herd management plan. Herd management plans describe herd population and management histories, population objectives, and management strategies for a minimum of 10 years. The herd management planning process is a way to incorporate the concerns and desires of the public with the biological capabilities of specific big game herds. Public input is a very important part of the herd management planning process.

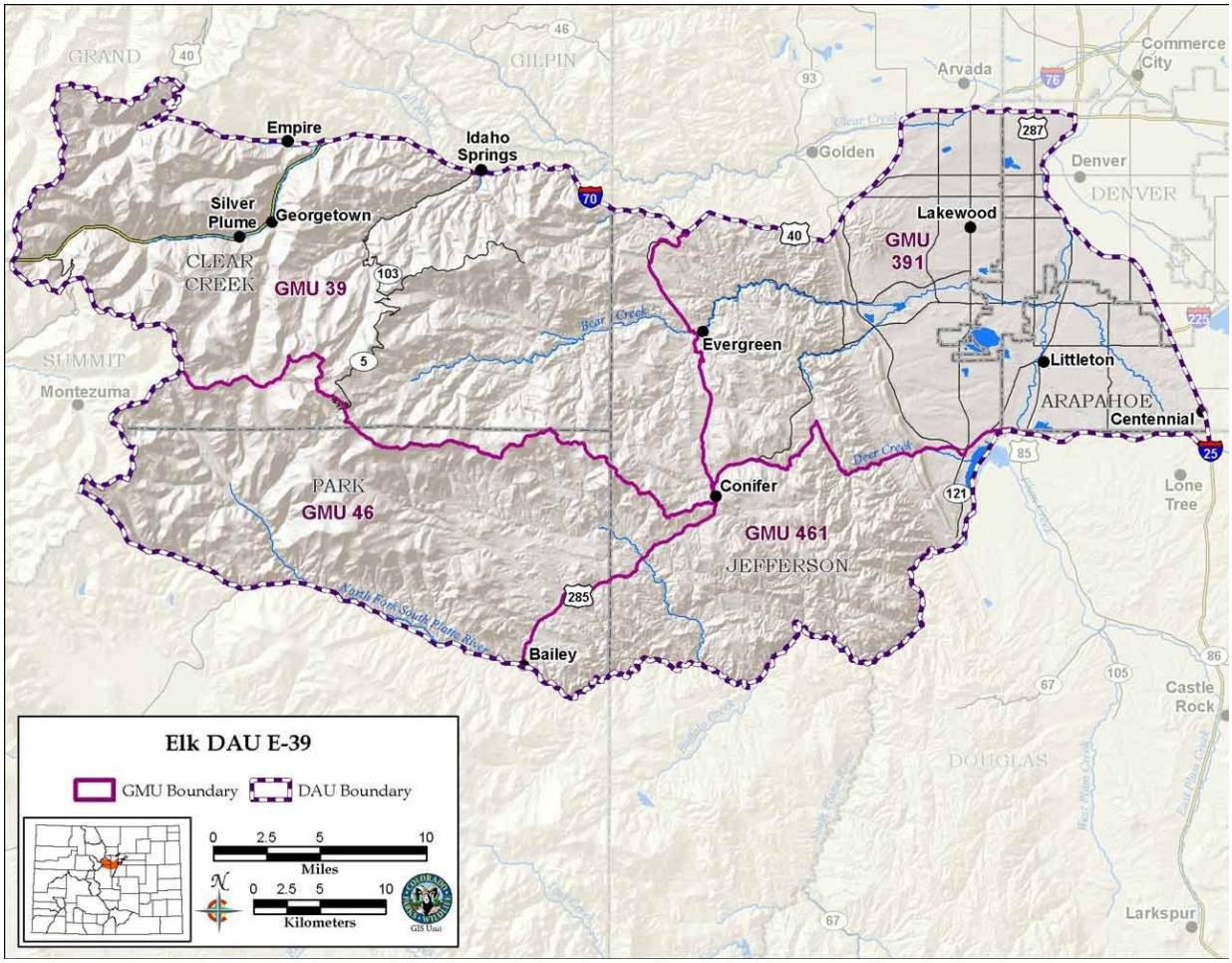
Colorado Parks and Wildlife (CPW) wildlife managers have begun the process of updating the herd management plan for the Mount Evans elk herd (GMUs 39, 391, 46 and 461). The Mount Evans elk herd is located in central Colorado in portions of Arapahoe, Clear Creek, Denver, Douglas, Jefferson, and Park counties (see map below). The herd is bounded on north by Continental Divide, U.S. 40, and I-70; on east by I-25 and South Platte River; on south by North Fork of the South Platte River and U.S. 285; on west by North Fork of South Platte River and Continental Divide. Municipalities include Bailey, Bergen Park, Conifer, Denver and surrounding metro areas, Evergreen, Georgetown, Idaho Springs, and Morrison. Much of the area in the eastern portion of the herd management area contains metropolitan areas and unincorporated subdivisions, while the western portion contains public lands.

CPW is seeking your input on the future management of this herd. The information you provide will help CPW develop objectives and management strategies for the herd.

Please complete the online survey, available December 1st, at http://wildlife.state.co.us/Hunting/BigGame/HerdManagementDAUPlans/Pages/HerdManagementDAUPlans.aspx or mail completed survey to:

COLORADO PARKS AND WILDLIFE
Attn: Ben Kraft
4207 West County Road 16E
Loveland, CO 80537

Online surveys must be completed by December 31st, 2013
Paper surveys must be mailed by December 31st, 2013



Geographic location of the Mount Evans elk herd (E-39) composed of GMUs 39, 391, 46, and 461.

TELL US ABOUT YOURSELF

Name (Optional):_____

1. Where do you live? Please refer to the map below to see where the Mount Evans elk herd is located. (Please check one.)

	Response Percent	Response Count
Within the area of the Mount Evans elk herd	**63.8%**	**240**
In Colorado, but outside the area of the Mount Evans elk herd	29.3%	110
Outside of Colorado	6.9%	26
	answered question	**376**
	skipped question	**6**

2. Please select the GMU within the Mount Evans elk herd in which you live. Please refer to the map below, if needed. (Please check one.)

	Response Percent	Response Count
39	28.1%	68
391	**44.6%**	**108**
46	12.0%	29
461	15.3%	37
	answered question	**242**
	skipped question	**140**

3. Which best describes the area you where you live within the Mount Evans elk herd area? (Please check one.)

	Response Percent	Response Count
Rural area on the plains	0.8%	2
Rural area in the foothills/mountains	**36.4%**	**86**
Within a small town in the foothills/mountains (Pop. less than 25,000)	21.2%	50
Within a small town on the plains (Pop. less than 25,000)	1.3%	3
Unincorporated subdivision	28.8%	68
Within an urban area (Pop. more than 25,000)	11.4%	27
	answered question	**236**
	skipped question	**146**

4. For how many years have you resided in the Mount Evans elk herd area? (Please type in.)

	Response Average	Response Total	Response Count
Years	**19.23**	**4,499**	234
		answered question	**234**
		skipped question	**148**

5. Do you own or lease any land that is not part of a residence within a subdivisions in GMUs 39, 391, 46 or 461? Please refer to the map below, if needed. (Please check one.)

	Response Percent	Response Count
Yes	14.6%	54
No	**85.4%**	**316**
	answered question	**370**
	skipped question	**12**

6. In which of the following GMUs do you own or lease land within the Mount Evans area? See the map below, if necessary. (Please check all that apply.)

	Response Percent	Response Count
39	27.8%	15
391	25.9%	14
46	16.7%	9
461	**33.3%**	**18**
	answered question	**54**
	skipped question	**328**

7. Which of the following best represented your interest in the Mount Evans elk herd? (Please check one.)

	Response Percent	Response Count
Rancher or Farmer	1.4%	5
Business Owner	0.3%	1
Landowner (>100 acres)	6.3%	23
Guide/Outfitter	0.3%	1
Sportsperson/Hunter	**69.3%**	**253**
Outdoor Recreation, Not Related to Hunting or Fishing (e.g., hiking, off-road vehicle use, backpacking, camping)	11.0%	40
Conservation/Environmental Non Government Organization	1.1%	4
Natural Resources or Land Management Agency Personnel	0.3%	1
Vacationer to Area	0.3%	1
Other (please specify)	9.9%	36
	answered question	**365**
	skipped question	**17**

8. What is your attitude towards the Mount Evans elk herd? (Please check one.)

	Response Percent	Response Count
Enjoy the elk without reservations	**60.8%**	**222**
Enjoy the elk, but worry about problems associated with the elk herd	38.1%	139
Do not enjoy the elk	1.1%	4
	answered question	**365**
	skipped question	**17**

9. How interested are you in watching or photographing the Mount Evans elk herd? (Please check one.)

	Response Percent	Response Count
Not at all interested	7.5%	27
Slightly interested	11.3%	41
Somewhat interested	11.9%	43
Moderately interested	21.8%	79
Very interested	**47.2%**	**171**
I am not sure.	0.3%	1
	answered question	**362**
	skipped question	**20**

10. Please rank the following items in order that reflects which is the most important to your wildlife viewing experience. Give a score of 1 to the most important factor, and 3 to the least important. Do not use any number more than once.

	1	2	3	Rating Average	Rating Count
Being able to see large groups of elk	30.0% (107)	**39.2% (140)**	30.8% (110)	2.01	357
Being able to easily find elk	**38.4% (137)**	31.9% (114)	29.7% (106)	1.91	357
Being able to see large-antlered bulls	31.7% (113)	28.9% (103)	**39.5% (141)**	2.08	357
				answered question	**357**
				skipped question	**25**

11. What, if any, conflicts have you personally experienced as a result of elk in the Mount Evans area? (Please check all that apply.)

	Response Percent	Response Count
No conflicts	**65.6%**	**236**
Vehicle collisions	11.1%	40
Agricultural/Ranch conflicts	5.3%	19
Damage to business not related to agriculture	2.2%	8
Property damage at home	13.6%	49
Physical conflict, not including vehicle collisions	5.0%	18
Other (please specify)	11.4%	41
	answered question	**360**
	skipped question	**22**

Page 7, Q11. What, if any, conflicts have you personally experienced as a result of elk in the Mount Evans area? (Please check all that apply.)		
1	On two hunting trips i have had people shoot 100 rds of ammo at dawn and dusk of opening day....then sneak off before the could be talked to. possible animal rights people. they definately left quickly.	Dec 31, 2013 9:21 AM
2	elk were there first!!! keep the hell out of their way!!!!	Dec 29, 2013 6:31 PM
3	Harrisment by non-hunting residents while I am hunting/scouting.	Dec 29, 2013 10:10 AM
4	Neighbors tresspassing to hunt elk	Dec 27, 2013 2:59 PM
5	Elk dying natural deaths on property and drawing carrion (mtn. lions, coyotes)	Dec 26, 2013 9:49 AM
6	Traffic problems with elk blocking the roadway	Dec 26, 2013 9:46 AM
7	How Hiwan golf club manages the elk on the golf course	Dec 23, 2013 3:10 PM
8	Garden raiders!	Dec 23, 2013 10:34 AM
9	Minor Fence damage	Dec 22, 2013 4:33 AM
10	ornimental tree damage	Dec 18, 2013 10:49 PM
11	People making noise & Bicycle ridding on trails during hunting season	Dec 18, 2013 4:56 PM
12	injured my horses	Dec 17, 2013 3:35 PM
13	no hunting	Dec 14, 2013 8:10 AM
14	Foolish people driving recklessly to take photos, near run in with elk from elk meadow on Hwy 74 at night	Dec 13, 2013 7:36 PM
15	Gardening Problems, but elk trump garden	Dec 13, 2013 4:39 PM
16	Basically no conflicts except eating flowers and bushes	Dec 13, 2013 12:19 PM
17	backpackers fouling up a hunt	Dec 13, 2013 8:06 AM
18	Trees blown down everyware in the area (Over trails)	Dec 13, 2013 8:01 AM
19	traffic delays	Dec 13, 2013 7:12 AM
20	Traffic delays as they cross roadways	Dec 13, 2013 6:28 AM
21	Access on Mt Evans road.	Dec 12, 2013 10:21 AM
22	I am a hunter and found that there was a limited number of elk in 39 as compared to my previous hunt. Montana is looking better, while I have found Colorado Fish & Game to be a very supportive group.	Dec 11, 2013 10:33 PM
23	I haven't seen the herd in several years!	Dec 11, 2013 7:32 PM
24	population decline. elk disappeared almost entirely in the past many years	Dec 11, 2013 7:28 PM

Page 7, Q11. What, if any, conflicts have you personally experienced as a result of elk in the Mount Evans area? (Please check all that apply.)		
25	As a Elk Hunter access to Public Land is very limited. The herd seems to migrate to the private with no hunting access	Dec 11, 2013 1:44 PM
26	private land access	Dec 11, 2013 12:09 PM
27	elk seemed to have left area	Dec 11, 2013 8:47 AM
28	traffic backups often, observing people getting too close when takingphotos making elk visibly anxious	Dec 11, 2013 7:58 AM
29	eaten vegitation	Dec 10, 2013 11:40 PM
30	residents resistant to hunting, opposing hunting	Dec 10, 2013 8:59 PM
31	Droppings near streams and lakes	Dec 10, 2013 1:59 PM
32	They pooped on my driveway	Dec 7, 2013 9:43 PM
33	traffic jams	Dec 7, 2013 12:45 PM
34	Vehicle charged but no collision	Dec 6, 2013 7:57 PM
35	most importatn, damage to vegetation	Dec 5, 2013 6:50 AM
36	anti hunting activities in the SWA	Dec 5, 2013 6:44 AM
37	Property damage from prior owners, neighbors, feeding	Dec 4, 2013 11:50 AM
38	Fence damage	Dec 4, 2013 10:09 AM
39	Hunters tresspassing on my property	Dec 4, 2013 9:41 AM
40	Hunter vs nonhunter or antihunter conflicts	Dec 3, 2013 10:10 PM
41	no conflicts. Drive with caution in specified areas and admire all animals from a distance	Dec 3, 2013 3:49 PM

12. How concerned are you about the following elk-related issues in the Mount Evans area? (Please check one for each item.)

	Very concerned	Somewhat concerned	Not at all concerned	I am not sure.	Rating Count
Elk-vehicle collisions	21.5% (76)	**40.2% (142)**	35.4% (125)	2.8% (10)	353
Damage to agricultural/ranch products (for example: hay, fences, etc.)	5.5% (19)	38.8% (135)	**52.0% (181)**	3.7% (13)	348
Elk damage to your business not related to agricultural production (for example fences and landscaping)	3.8% (13)	13.7% (47)	**75.5% (259)**	7.0% (24)	343
Elk damage to your residence, including trees, fences or landscaping	9.2% (32)	20.7% (72)	**66.3% (230)**	3.7% (13)	347
Loss of elk habitat due to human development	**66.5% (234)**	21.0% (74)	10.8% (38)	1.7% (6)	352
Revenue generated from elk related tourism to local economies	17.4% (61)	**45.1% (158)**	32.6% (114)	4.9% (17)	350
				answered question	**355**
				skipped question	**27**

13. How effective do you feel CPW's current elk management strategies are for the Mount Evans elk herd at balancing public desires and concerns? Please consider elk watching, property damage, vehicle collisions, how CPW provides for and limits hunting, etc. (Please check one.)

	Response Percent	Response Count
Very ineffective	9.4%	34
Somewhat ineffective	15.5%	56
Neither effective nor ineffective	11.3%	41
Somewhat effective	**24.3%**	**88**
Very effective	18.5%	67
I am not sure	21.0%	76
	answered question	**362**
	skipped question	**20**

Colorado Parks and Wildlife manages big game herds to provide the public with hunting and viewing opportunities, while minimizing conflicts and damage caused by the herd. In order to accomplish those goals, the total number of animals in the herd and the proportion of males in the herd are considered. Therefore, herd management plans define 1) a population objective and 2) a ratio of males to females objective.

Population Objective: Colorado Parks and Wildlife strives to manage big game populations within both the biological and social carrying capacity of the herd. The biological carrying capacity is the number of animals that can be supported by the available habitat. The social carrying capacity is the number of animals tolerated by the people affected by the herd. When big game populations are at optimal levels, habitat damage is not a consideration, people are able to enjoy viewing, photographing, and hunting big game, and big game-human conflicts are minimized. If big game numbers are too low, it is difficult for viewers and hunters to find big game. If big game numbers are too high, habitat damage occurs and conflicts may rise to intolerable levels.

In order to increase big game populations, fewer licenses will be available in the short-term, but more licenses will become available each year in the long term. In order to decrease big game populations, more licenses will be available short-term, but fewer licenses will be available each year in the long-term.

14. How should the Mount Evans elk herd population size be managed? (Please check one.)

	Response Percent	Response Count
Increase greatly (more than 25%)	18.7%	67
Increase somewhat (around 10%)	**26.0%**	**93**
Stay the same	22.9%	82
Decrease somewhat (around 10%)	18.4%	66
Decrease greatly (more than 25%)	4.5%	16
I am not sure.	9.5%	34
	answered question	**358**
	skipped question	**24**

15. How should the elk population in GMU 39 be managed? (Please check one.)

	Response Percent	Response Count
Increase greatly (more than 25%)	16.1%	57
Increase somewhat (around 10%)	**24.4%**	**86**
Stay the same	23.8%	84
Decrease somewhat (around 10%)	14.2%	50
Decrease greatly (more than 25%)	4.5%	16
I am not sure.	17.0%	60
	answered question	**353**
	skipped question	**29**

16. How should the elk population in GMU 391 be managed? (Please check one.)

	Response Percent	Response Count
Increase greatly (more than 25%)	9.9%	35
Increase somewhat (around 10%)	15.3%	54
Stay the same	**26.1%**	**92**
Decrease somewhat (around 10%)	17.0%	60
Decrease greatly (more than 25%)	8.2%	29
I am not sure.	23.5%	83
	answered question	**353**
	skipped question	**29**

17. How should the elk population size in GMU 46 be managed? (Please check one.)

	Response Percent	Response Count
Increase greatly (more than 25%)	18.6%	66
Increase somewhat (around 10%)	22.5%	80
Stay the same	22.3%	79
Decrease somewhat (around 10%)	8.7%	31
Decrease greatly (more than 25%)	2.3%	8
I am not sure.	**25.6%**	**91**
	answered question	**355**
	skipped question	**27**

18. How should the elk population in GMU 461 be managed? (Please check one.)

	Response Percent	Response Count
Increase greatly (more than 25%)	13.3%	47
Increase somewhat (around 10%)	18.1%	64
Stay the same	24.0%	85
Decrease somewhat (around 10%)	11.6%	41
Decrease greatly (more than 25%)	4.5%	16
I am not sure.	**28.5%**	**101**
	answered question	**354**
	skipped question	**28**

Male to Female Ratio Objective: For a specific population size, there is a tradeoff between the number of male licenses available to hunters vs. the quality of males available to harvest. Big game herds can be managed to maximize 1) male hunting opportunity, 2) male quality (i.e., more males and older, larger males), or 2) some compromise between male hunting opportunity and male quality. For that specific population size, if the herd is managed to maximize male hunting opportunity, more male licenses are available and hunters are able to obtain male licenses more easily. This management strategy results in fewer males and fewer large old males in the herd. If the herd is managed to maximize the antler/body size of the males, fewer male licenses are issued each year. As a result, the average body/antler size of males harvested is greater and hunters will see more males while hunting, however, hunters may not be able to draw male licenses as frequently. Currently, the Mount Evans elk herd is managed for moderate levels of both male opportunity and male quality.

19. How should the Mount Evans elk herd male to female ratio be managed? (Please check one.)

	Response Percent	Response Count
No change. Maintain moderate levels of opportunity and bull quality	**45.5%**	**161**
Increase bull quality	24.6%	87
Increase bull hunting opportunity	18.9%	67
I am not sure.	11.0%	39
	answered question	**354**
	skipped question	**28**

20. How should themale to female ratio be managed in GMU 39? (Please check one.)

	Response Percent	Response Count
No change. Maintain moderate levels of opportunity and bull quality	**42.0%**	**148**
Increase bull quality	21.3%	75
Increase bull hunting opportunity	17.0%	60
I am not sure.	19.6%	69
	answered question	**352**
	skipped question	**30**

21. How should themale to female ratio be managed in GMU 391? (Please check one.)

	Response Percent	Response Count
No change. Maintain moderate levels of opportunity and bull quality	**36.2%**	**126**
Increase bull quality	18.1%	63
Increase bull hunting opportunity	17.0%	59
I am not sure.	28.7%	100
	answered question	**348**
	skipped question	**34**

22. How should themale to female ratio be managed in GMU 46? (Please check one.)

	Response Percent	Response Count
No change. Maintain moderate levels of opportunity and bull quality	**34.1%**	**120**
Increase bull quality	20.7%	73
Increase bull hunting opportunity	16.2%	57
I am not sure.	29.0%	102
	answered question	**352**
	skipped question	**30**

23. How should themale to female ratio be managed in GMU 461? (Please check one.)

	Response Percent	Response Count
No change. Maintain moderate levels of opportunity and bull quality	**33.0%**	**116**
Increase bull quality	17.4%	61
Increase bull hunting opportunity	17.9%	63
I am not sure.	31.6%	111
	answered question	**351**
	skipped question	**31**

ELK HUNTING

25. Have you hunted elk in the Mount Evans elk herd (GMU's 39, 391, 46, or 461)? (Please check one.)

	Response Percent	Response Count
Yes	**76.2%**	**215**
No	23.8%	67
	answered question	**282**
	skipped question	**100**

24. Have you ever hunted elk in Colorado? (Please check one.)

	Response Percent	Response Count
Yes	**79.6%**	**284**
No	20.4%	73
	answered question	**357**
	skipped question	**25**

26. In which Mount Evans elk herd GMUs have you hunted elk? (Please check all that apply.)

	Response Percent	Response Count
39	**60.5%**	**130**
391	23.3%	50
46	29.3%	63
461	18.1%	39
I am not sure.	1.4%	3
	answered question	**215**
	skipped question	**167**

27. Within the Mount Evans elk herd (GMU's 39, 391, 46, or 461), do you hunt on your property? (Please check one.)

	Response Percent	Response Count
Yes	27.9%	60
No	**72.1%**	**155**
	answered question	**215**
	skipped question	**167**

28. Do you or members of your household apply for private land only licenses for the Mount Evans elk herd (GMU's 39, 391, 46, or 461)? (Please check one.)

	Response Percent	Response Count
Yes	43.3%	93
No	**56.7%**	**122**
	answered question	**215**
	skipped question	**167**

29. If you have hunted the Mount Evans elk herd, what percent of your time hunting do you hunt on private land? (Please indicate for each GMU in which you hunt. If you do not hunt in a GMU, please leave it blank.)

	Response Percent	Response Count
GMU 39	**62.1%**	**118**
GMU 391	31.1%	59
GMU 46	34.7%	66
GMU 461	25.3%	48
	answered question	**190**
	skipped question	**192**

30. How would you rank your elk hunting experience in the Mount Evans area? (Please check one.)

	Response Percent	Response Count
Excellent	16.8%	36
Good	**32.7%**	**70**
Fair	30.4%	65
Poor	19.2%	41
I am not sure.	0.9%	2
	answered question	**214**
	skipped question	**168**

31. How do you rate your opportunity to harvest elk for meat in the Mount Evans area? (Please check one.)

	Response Percent	Response Count
Excellent	15.4%	33
Good	28.5%	61
Fair	**32.2%**	**69**
Poor	22.9%	49
I am not sure.	0.9%	2
	answered question	**214**
	skipped question	**168**

32. How do you rate your opportunity to harvest large-antlered bulls in the Mount Evans area? (Please check one.)

	Response Percent	Response Count
Excellent	7.0%	15
Good	22.5%	48
Fair	31.5%	67
Poor	**32.9%**	**70**
I am not sure.	6.1%	13
	answered question	**213**
	skipped question	**169**

33. How do you describe the level of crowding you experience while hunting in the Mount Evans area? (Please check one.)

	Response Percent	Response Count
Very crowded	9.8%	21
Somewhat crowded	17.8%	38
Slightly crowded	25.7%	55
Not at all crowded	**43.5%**	**93**
I am not sure.	3.3%	7
	answered question	**214**
	skipped question	**168**

34. Please rank the following items from 1 to 5 to indicate which would be most likely improve your elk hunting experience in the Mount Evans elk herd. Please give a 1 to the item most likely to improve your experience and 5 to the item least likely to improve your experience. Do not use any number more than once.

	1	2	3	4	5	Rating Average	Rating Count
Less hunter crowding	9.1% (19)	19.6% (41)	23.9% (50)	19.1% (40)	**28.2% (59)**	3.38	209
Harvesting an elk	**36.4% (76)**	30.6% (64)	22.5% (47)	5.3% (11)	5.3% (11)	2.12	209
Harvesting a large-antlered bull elk	20.6% (43)	16.7% (35)	23.0% (48)	**27.8% (58)**	12.0% (25)	2.94	209
Seeing more elk	18.7% (39)	22.5% (47)	18.7% (39)	**25.8% (54)**	14.4% (30)	2.95	209
Hunting bull elk in the Mount Evans elk herd every year	15.3% (32)	10.5% (22)	12.0% (25)	22.0% (46)	**40.2% (84)**	3.61	209
					answered question		**209**
					skipped question		**173**

36. Please provide additional comments regarding the future management of the Mount Evans elk herd below.

General comments from the survey available from CPW upon request.

APPENDIX D: COMMENT LETTERS

Good evening Ben I'm the ranch manager on the Evans Ranch. I grew up in Evergreen & been the ranch manager for 16 yrs. I believe we don't have the elk numbers on the west end of area 39. The blizzard of 03 moved a lot of the elk to evergreen and even below that. The number of big bulls are down as well. We have not taken any big bulls in a few years. We on the ranch are doing our best to try to manage what we can do here. But I do see a lot of nice bulls hanging in evergreen. What I believe would be a good thing to do is in the spring. With the numbers of elk in town would be move some yearly's to the top of Mt Evans and see where they go. The cow's that are here will move up and you would hope that they would join up. Then we would help the gene pool too. The division moved the elk that are here from Yellowstone. So I believe by moving some yearly's they will not be go back to town like a mature cow would. Thanks for what all of you guys do!

Mount Evans Elk Herd Management Plan 2015

Comments from

Englewood, CO 80111

I have reviewed the 2015 Draft Mount Evans Elk Herd Management Plan for GMUs 39, 391, 46, 461 and the CPW should be commended for their continuing efforts and success in managing this herd located close to the Denver urban fringe. The document is easily understood and provides significant information about the herd and many of the challenges facing the CPW.

I have hunted elk in GMU 39 for the last 10 years and have seen many changes in how the elk utilize the area over this period. The following are my comments on this important document that I request the CPW fully consider before finalizing the 2015 Management Plan.

Elk in developed areas is a trend

Over the last 10 years I have seen an apparent increase in the number of elk utilizing lands where hunting is precluded because of development or restriction, primarily in Jefferson County. I believe the CPW should continue their efforts to unlock these areas for hunting purposes. Eliminating elk refuge areas should have a positive effect on herd management and reduction of elk-human conflict. I support the expansion of GMU 391 to the Jefferson County line. I recommend:

- Continue every effort to unlock lands that act as refuge for elk during the hunting season in an effort to reduce the herd in developed areas and encourage more of the herd onto USFS lands. Including such language into the Preferred Alternative is requested and appropriate to help focus CPW efforts going forward.
- Increasing the availability of cow licenses in GMU 391 and 461.

- Relocate young elk found on lands in GMU 391 and 461 to USFS lands in GMU 39 and 46 where they can comingle with elk utilizing wild areas.
- Enhancing elk habitat in GMU 39 and 46, especially in the State Wildlife Area and consider similar projects on USFS lands.
- Consider elk culling in the populated areas of eastern Jefferson County.

The bull to cow ratio may be declining

As indicated on page 24 and in Figure 13, the bull to cow ratio may be declining and the population models used by the CPW may be overestimating the bull to cow ratio. This is a potentially serious problem for elk herd managers and elk hunters. A reduced percentage of bulls in the herd will reduce the overall hunting enjoyment gained by the many hunters in the area. If hunters leave the Mount Evans Elk Herd range due to the lack of bulls, the CPW will face additional challenges in managing this herd. I recommend:

- Do not accept a change from the 1998 Plan of 45:100 bull to cow ratio goal for this elk herd as found in the Preferred Alternative. I request the CPW retain the single ratio of 45:100 as the bull to cow ratio goal and work each year toward that goal. Establishing broad goal ranges only serves to confuse the concept of a "goal."
- Expend additional research to determine if the modeled or observational data on bull to cow ratios better reflect herd conditions.
- Reduce the bull licenses granted in GMUs 39 and 46 until it is determined that the bull to cow ratio meets 45:100.

Large antlered elk hunting opportunity

The 1998 Plan for the Mount Evans Herd was, in part, geared toward improving herd conditions where hunters could have an opportunity to harvest large antlered animals. It appears from reading the 2015 Management Plan that the CPW has abandon this important goal. The 2015 Management Plan has a goal of maintaining bull hunting but any mention of older "large antlered" elk is

noticeably absent. This is a disappointing shift in the State's view of this important resource and should be seriously reconsidered. Having an elk herd so close to the Denver area where a fortunate hunter might have an opportunity to bag a "once in a lifetime" elk is a truly unique resource and one that should be protected and encouraged by the CPW. I recommend:

- Reintroduce the concept of encouraging the growth of older large antlered elk back into the 2015 Management Plan as part of the Preferred Alternative.
- Establish a "Trophy Elk" designation for GMU 39 and 46 into the Preferred Alternative.
- Reduce the bull licenses available in GMUs 39 and 46 for several years to allow survival of older large antlered bulls.
- Consider a branched-antler regulation for GMU 39 and 46.
- Consider a one year moratorium on bull harvest to seed the herd with more and older bulls.

Comments
Mount Evans Elk Herd Management Plan 2015

I have reviewed the 2015 Draft Mount Evans Elk Herd Management Plan for GMUs 39, 391, 46, 461. I am pleased that CPW is taking a serious look at the situation of this significant elk herd so close to the Denver urban and suburban area.

I am a landowner in Unit 39 – Vance Creek Ranch, which is a part of the five ranch Evans Ranch. I have hunted elk in Unit 39 since about 1992.

I believe that the single biggest issue, and one that may be very difficult to address, is that the elk have somehow learned over the last twenty-five or so years that they can remain in the greater Evergreen suburban area, and even down to Golden area, where there is no hunting pressure and plenty of food sources. The historical migration patterns have disappeared for this group of elk. This fact is lessening good hunting opportunities in the Mt. Evans State Wildlife Area, the national forest of Unit 39, and privately held ranch land as well. Their presence in developed areas also increases the likelihood of bad elk-human interactions, such as automobile collisions with elk and damage to suburban grounds such as lawns and trees.

Therefore I think the focus of the Management Plan should be to somehow get elk which are now year round residents in areas where there is no hunting to move back into the lesser developed or non-developed lands west of Evergreen. Possible means of accomplishing this are hazing the animals; selective “sharpshooting” in semi-developed areas to cull the “suburban” herd, to actual rounding up of the elk and driving them to the west.

I believe everyone agrees there is a large number of elk in the herd; it’s just that a very significant percentage of the elk are residing in areas which are not open to hunting and lead to unfortunate elk-human interaction.

Thank you for the opportunity to comment on the Plan.

Thanks for the opportunity to comment on the draft E39 plan, Ben. I talked to Mikele Painter on the South Platte District so that I had a better understanding of their concerns in GMU 46 and 461. The comments in this email are relative to GMU 39 and, to a lesser extent, GMU 391. I have discussed and reviewed this input with Penny Wu, Clear Creek District Ranger.

We agree with all your threats identified, especially increasing recreation pressure in elk habitats, animal-vehicle collisions, loss of habitat to development and the evolution of 'resident' elk herds within communities. It is our intent to continue to explore forest restoration/wildlife habitat improvement projects in the greater Evergreen vicinity (e.g. Beaver Brook) to improve elk habitat conditions on adjacent public lands. We have also started a program to remove obsolete barbed wire fence in critical movement corridors like Highway 103/Witter Gulch.

You discuss areas of significant blowdown on p. 20 and might want to add the large area of spruce forest blowdown in the Mt Evans Wilderness above the State Wildlife Area in the Bear track area.

Given the social capacity within the DAU, relative to the actual biological capacity for elk numbers, we support your preferred alternative of a herd objective of 2200 to 2600 animals, and a desired sex ratio of 30 to 40 bulls per 100 cows. Other alternatives are likely to either increase conflict within known conflict areas or reduce herds to levels well below their potential.

Well done, document, Ben. Thanks again for the opportunity for input.

Doreen Summerlin, Wildlife Biologist, USFS

Hello Ben,

The South Platte Ranger District appreciates the opportunity to comment on the E-39 Draft Elk Herd Management Plan. As you know, I have spoken with Doreen Sumerlin on the Clear Creek Ranger District, so I have a general understanding of the situation in E-39 on both ranger districts. I have also discussed this input with Randy Hickenbottom, South Platte District Ranger, and Ralph Swain, Regional Wilderness Manager.

Given the social capacity within the DAU relative to the actual biological capacity for elk numbers, we support your preferred alternative of a herd objective of 2,200 to 2,600 animals, and a desired sex ratio of 30 to 40 bulls per 100 cows. This objective is consistent with existing herd management in the DAU. Other alternatives are likely to either increase conflict within known conflict areas or reduce herds to levels well below their potential.

In GMUs 46 and 461 the conflicts with urban development are less than they are in GMUs 39 and 391, but recreation pressure and habitat management are issues we are keenly aware of on the South Platte district. We are striving to manage the ever-growing and diverse recreation demands on our public land. We will also continue to pursue appropriate vegetation treatments to address various opportunities for wildfire mitigation in the wildland-urban interface, forest restoration, and wildlife habitat improvement. Towards that end, we anticipate further coordination with CPW to meet our common goals for habitat and wildlife management.

Overall, I found the plan to be informative and well-written. I have a few comments specific to the draft document that you may consider:

In addition, Ralph Swain, the USFS Rocky Mountain Regional Wilderness Manager, had these remarks to add from the wilderness perspective:

1. The central mandate of the Wilderness Act is to protect and preserve the wilderness character of the area as wilderness.

2. The natural quality of wilderness character is affected if elk herds are allowed to increase outside of natural or historical levels.

3. I wish the report would of drawn from law (W. Act) and Policy (FSM 2320) to address meeting wildlife/wilderness objectives.

4. For example, instead of relying on survey and hunter preference, more attention should be given to meeting the wilderness objective of historical herd size that will not impair the vegetation beyond “historical” use levels.

5. Also, relatedly, if any alternative suggests vegetative manipulation in wilderness, it would be a trammeling not allowed by law and by FSM2320, only the Chief of the FS can approval veg manipulation in wilderness.

6. Finally, collaring remains an issue. Cordell's research strong indicates that one of the top reason people value wilderness is the opportunity to view wildlife in their natural setting (wild – without collars!).

Should you have any questions about these remarks, please don't hesitate to contact me (mpainter@fs.fed.us, 303-275-5614) or Ralph Swain (rswain@fs.fed.us, 303-275-5058).

Thank you very much for the opportunity to participate – I will be looking forward to the final plan!

Cheers,
Mikele

Mikele Painter
Wildlife Biologist

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Caring for the land and serving people

February 4, 2015

COLORADO PARKS AND WILDLIFE
Attn: Ben Kraft
4207 West County Road 16E
Loveland, CO 80537

RE: DAU Plan E-39 (Mt. Evans Elk, GMUs #39, 391, 46, & 461)

Dear Ben,

Thank you for the providing information regarding the Elk DAU Plan E-39 to the South Park Habitat Partnership Program committee. We appreciate you taking the time to keep us involved and informed. The committee's recommendation applies only to GMUs 46 & 461 in DAU E-39 which occur within the South Park Habitat Partnership Program Area.

After reviewing and discussing the plan, it is our consensus that we support Colorado Parks and Wildlife's recommendations of Preferred Alternative #2 with a post hunt objective of 2,200-2,600 head of elk and a herd composition-sex ratio objective of 30-40 bulls:100 cows.

Additionally, the committee feels that it is extremely important that Elk DAU Plan E-39 includes provisions to provide limited public big game hunting opportunities on the Staunton State Park in order to be able to effectively control animal distribution and to aid in mitigation of future localized elk conflict issues.

Thank you for allowing our committee to provide input and comment on this plan. We feel it is extremely important to find the balance between managing big game and reducing damage to livestock operators. We feel it is important to realize the positive economic importance of hunting to the local businesses and landowners. If you have any questions or concerns, please feel free to contact me at 303-838-9638 or by e-mail at woodwardcattle@wispertel.net. Thank you!

Sincerely,

John Woodward
South Park HPP Committee - Chairman