

**WILLIAMS FORK ELK HERD MANAGEMENT PLAN  
DATA ANALYSIS UNIT E-13  
Game Management Units 28, 37, and 371**



Kirk Oldham  
Colorado Division of Wildlife  
Terrestrial Biologist  
PO Box 216  
Hot Sulphur Springs, CO 80451

**September 2, 2010**



**DATA ANALYSIS UNIT PLAN E-13**  
**Contents**

<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>INTRODUCTION AND PURPOSE .....</b>	<b>7</b>
<b>DESCRIPTION OF THE DATA ANALYSIS UNIT .....</b>	<b>10</b>
<b>Location .....</b>	<b>10</b>
<b>Topography .....</b>	<b>10</b>
<b>Climate .....</b>	<b>10</b>
<b>Vegetation .....</b>	<b>12</b>
<b>Land Status.....</b>	<b>14</b>
<b>Land Use .....</b>	<b>15</b>
<b>HABITAT RESOURCE.....</b>	<b>17</b>
<b>Public Lands.....</b>	<b>19</b>
<b>Private Lands.....</b>	<b>21</b>
<b>HERD MANAGEMENT HISTORY .....</b>	<b>22</b>
<b>Posthunt Population Size.....</b>	<b>23</b>
<b>Posthunt Herd Composition.....</b>	<b>23</b>
<b>Other Management Activities in DAU E-13.....</b>	<b>25</b>
<b>Harvest History .....</b>	<b>25</b>
<b>Season Structure .....</b>	<b>27</b>
<b>CURRENT HERD MANAGEMENT.....</b>	<b>28</b>
<b>Current Objective.....</b>	<b>28</b>
<b>CURRENT MANAGEMENT PROBLEMS/CONSTRAINTS .....</b>	<b>28</b>
<b>ALTERNATIVE DEVELOPMENT.....</b>	<b>31</b>
<b>APPENDIX A .....</b>	<b>37</b>
<b>Population Dynamics</b>	
<b>APPENDIX B .....</b>	<b>39</b>
<b>Public Questionnaire</b>	
<b>APPENDIX C .....</b>	<b>47</b>
<b>Questionnaire Results</b>	
<b>APPENDIX D.....</b>	<b>50</b>
<b>Land Management Agency and Stakeholders Comments</b>	

## DAU E-13 (Williams Fork) EXECUTIVE SUMMARY

**GMU's: 28, 37, and 371**

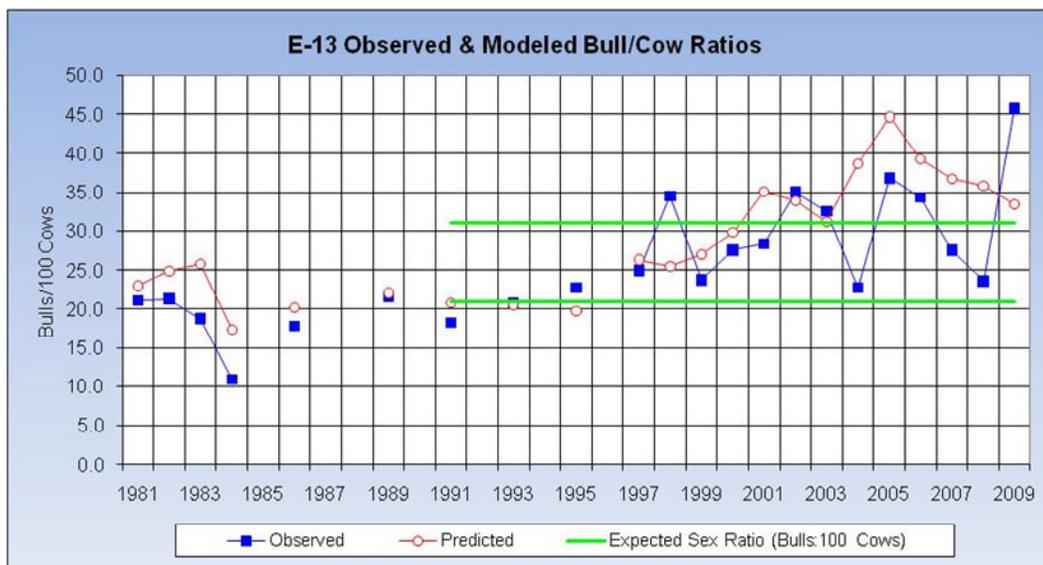
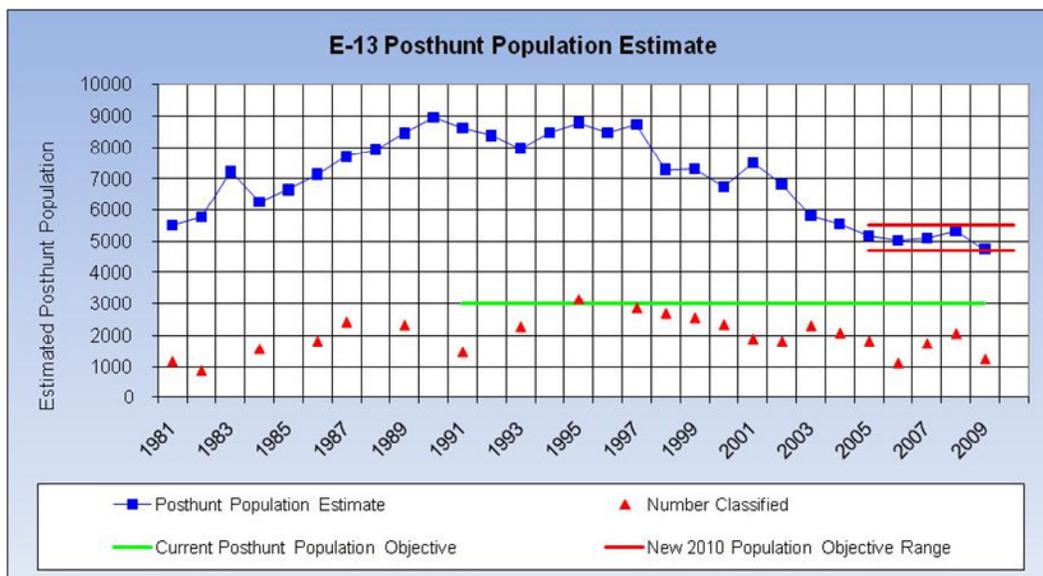
**Land Ownership:** 27% Private, 65% USFS, 5% BLM, 2% CDOW, 1% NGO

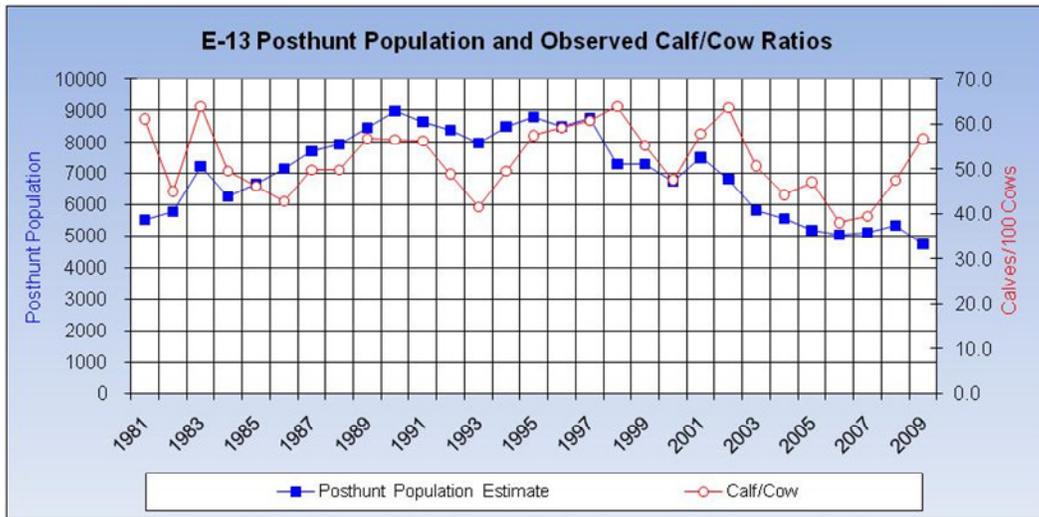
**Post-hunt Population:** Previous Objective 3,000, 2009 Post-hunt Estimate 4,700 **New Objective 4,700 to 5,500**

**Post hunt Sex ratio (Bulls:100 Cows):** Previous Objective: 24, 5-Year Average Observed: 33.6,

**Expected Sex Ratio (Bulls:100 cows) Range: 21-31 Bulls:100 Cows**

**Sex Ratio Lower Management Threshold: 24 Bulls:100 Cows**





### E-13 Background

Data Analysis Unit (DAU) E-13 is located in north-central Colorado (Grand and Summit counties) and encompasses the towns of Breckenridge, Dillon, Fraser, Frisco, Granby, Hot Sulphur Springs, Silverthorne, and Winter Park. E-13 contains Game Management Units (GMU) 28, 37, and 371. The current post hunt population objective of 3,000 was set in both the 1991 and 1999 DAU plans at a time when elk numbers were significantly higher and underestimated. Recent refinements to spreadsheet modeling constrain the biological inputs for models to those survival values derived from applicable research. This combined with the ability to align observed herd composition and harvest data with population size has produced improved population estimates. Additional years of experience and data have improved our population estimation and objective setting abilities. Thus, the primary goal of this DAU plan is to set the post-hunt population objective closer to the number of elk that exists within the DAU.

The post-season elk population in this DAU was above 8,000 animals between 1989 and 1997 and at a high of nearly 9,000 elk in 1990. E-13 is an Over-the-Counter (OTC) elk DAU for hunting. Significant antlerless harvest in the last decade has reduced the population to the current post-hunt population estimate of approximately 4,700. Antlerless licensing strategies has been liberal since 1999 and as a result antlerless harvest has exceeded antlered harvest 8 out of the past 10 years. Mean bull harvest for the years 1985 to 2009 is 501. The last five year average for bull harvest is 432. As a result of this significant historical harvest, private land game damage conflicts have been minimal during the past 10 years within this DAU.

The previous plan had a sex ratio (bulls:100 cows) objective of 24. Observed sex ratios averaged 29 bulls:100 cows from 1991 to 2009 and 34 bulls:100 cows from 2005 to 2009. Applying antler point restrictions, limiting participation in 1st and 4th rifle seasons, and increasing antlerless harvest has allowed bull to cow ratios to gradually increase and has provided good hunter opportunity and animal quality.

### **E-13 Significant Issues**

Only a limited amount of habitat is available in this DAU to support elk in the winter. Winter habitat continues to be converted to housing and associated development. Only 8% of the DAU is considered severe winter range for elk, and the majority of it lies within private property.

Since 1998, the mountain pine beetle infestations and resulting lodgepole pine mortality has significantly altered the vegetation type in this DAU. The loss of the lodgepole pine canopy has created an early seral stage that is abundant with grasses, forbs and shrubs. Thus, the forage for elk has increased significantly within the lodgepole forest. The resulting carrying capacity for elk has increased within this DAU and distribution of elk had been dramatically altered. This distribution and increased use of the lodgepole forest has also contributed to the reduction in game damage conflicts.

The majority of this DAU lies within public land managed by the United States Forest Service (USFS) or Bureau of Land Management (BLM). Changes in recreational use such as the increase in mountain bikes, all-terrain vehicles, and snowmobiles on public lands have made many more areas accessible throughout the year. Elk are susceptible to these types of recreational disturbances. Coupling these recreational changes with concentrations of hunters within certain areas of public land displaces elk onto private land where they are minimally hunted or not hunted at all.

### **E-13 Management Alternatives**

Four post-season population objective alternatives for E-13 have been evaluated:

1. 3,000 to 3,600 (current population objective)
2. 4,100 to 4,900 (lower range of current population estimate)
3. **Preferred Alternative 4,700 to 5,500** (upper range of current population estimate)
4. 5,100 to 6,000 (increase of 9% from current population estimate)

Alternative 1 would decrease the current population of elk by 36%. Alternative 2 proposes a lower range which is inclusive of the current population estimate. Alternative 3 is the preferred alternative that proposes a higher range inclusive of the current population estimate. Alternative 4 would increase the current population of elk by approximately a 9%, which is still below the population peaks of over 8,000 seen in 1989 and 1997. The preferred alternative of 4,700 to 5,500 is appropriate for the habitat capabilities of the DAU and was selected to balance elk population size, hunter satisfaction, and minimal game damage conflicts.

### **Expected Sex Ratio Range (Bulls: 100 cows)**

DAU E-13 has had OTC hunting for elk since 1947. From 1986 to present, the Colorado Division of Wildlife (CDOW) has been using the four-point antler restriction to protect yearling bulls from harvest.

Since 1981, the DOW has conducted 22 post-hunt bull to cow ratio classifications. Bulls:100 cow ratios have averaged 26 bulls:100 cows with a range of 18 to 46 bulls:100\_cows. The past 5-year average (2005-2009) is 33.6 bulls:100 cows.

Thus for this DAU plan a range of 21-31 bulls:100 cows is the expected sex ratio range given continued management with an OTC licensing system, antler point restrictions, and the current 5-year season structure. The recent 5-year average observed bull to cow ratio of 33.6 is above this expected sex ratio range. The overall bulls: 100 cows average since 1991 (28.7) and the 10-year average of 31.4 are within the proposed range.

### **Management Thresholds**

As long as the observed sex ratio (bulls:100 cows) stays within the “expected range”, license allocation will not be used to affect bull harvest in the limited 1st rifle, 4th rifle ,or muzzleloader seasons. Either sex licenses in the archery season would be maintained. OTC bull licenses in 2nd rifle season, and 3rd rifle season would also be maintained.

If 3-year averages of observed bulls:100 cows ratios fall below a lower threshold of 24 bulls:100 cows, strategies that would reduce bull harvest will be implemented. Specifically by limiting hunter opportunity in the muzzleloader, 1<sup>st</sup> and 4<sup>th</sup> rifle seasons.

## INTRODUCTION AND PURPOSE

The Data Analysis Unit (DAU) provides the Colorado Division of Wildlife (CDOW) direction in managing a big game species in a given geographical area. It identifies suitable habitat, gives the herd history and current status, identifies issues and problems, and provides direction for future management.

The CDOW manages wildlife for the use, benefit, and enjoyment of the people of the state in accordance with the CDOW's Strategic Plan and mandates from the Colorado Wildlife Commission and the Colorado Legislature. Colorado's wildlife resources require careful and increasingly intensive management to accommodate the many and varied public demands and growing impacts from people. To manage the state's big game populations, the CDOW uses a "management by objective" approach (Figure 1).

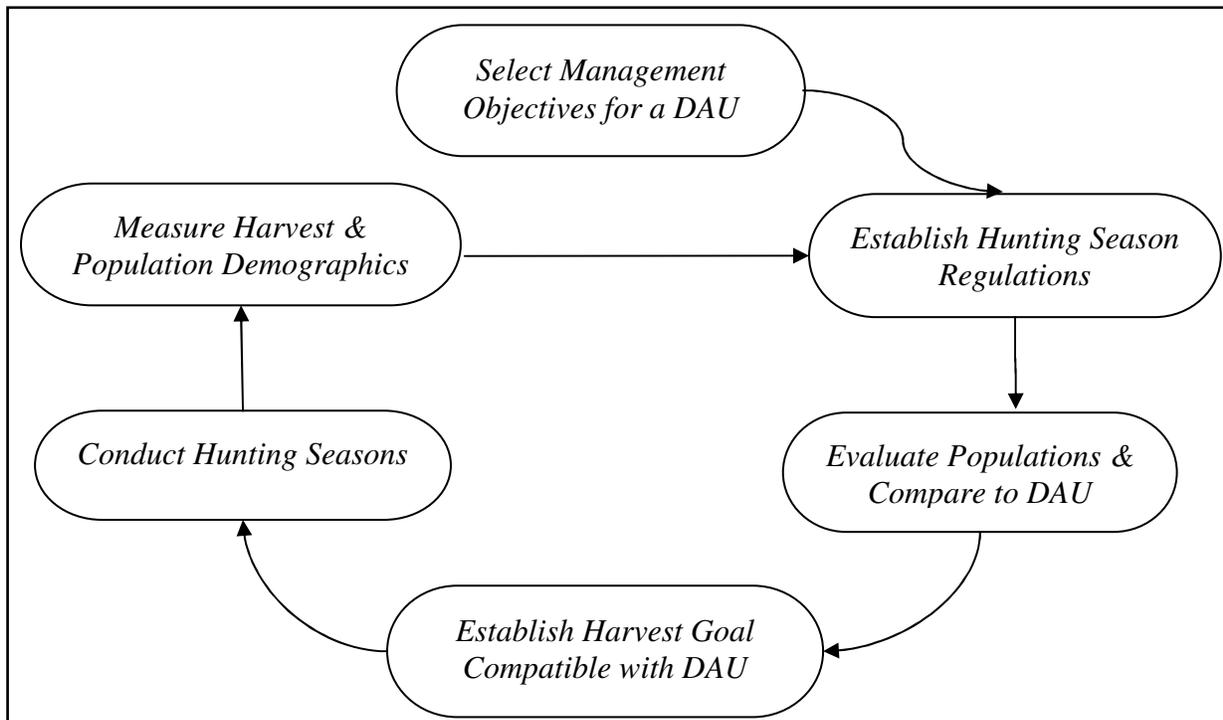


Figure 1. Management by objective process that CDOW uses to manage big game populations on a DAU basis

DAUs provide the framework to manage individual herds of big game animals. DAUs are generally discrete geographically, and attempt to identify a distinct big game population. However, individual animal movements may at times straddle or encompass more than one DAU. While DAU boundaries are administrative, they represent the best way to encompass the majority of a herd within a biological area, and allow the most practical application of management tools such as hunting to reach objectives. DAUs are typically composed of smaller areas designated as game management units (GMUs), which provide a more practical framework

where the management goals can be refined and applied on a finer scale, typically through hunting regulations.

The DAU plan process is designed to balance public demands, habitat capabilities, and herd capabilities into a management scheme for the individual herd. The public, hunters, federal land use agencies, landowners, and agricultural interests are involved in the determination of the plan objectives through questionnaires, public meetings, comments on draft plans, and comments to the Colorado Wildlife Commission. Limited license numbers and season recommendations result from this process.

The objectives defined in the DAU plan guide a long-term cycle of information collection, information analysis, and decision making. The DAU plan establishes the number of animals the DAU should contain and the herd composition. Once approved by the Colorado Wildlife Commission, the DAU objectives are compared to modeled population estimates. From these models, license numbers are set. The inputs to these models include:

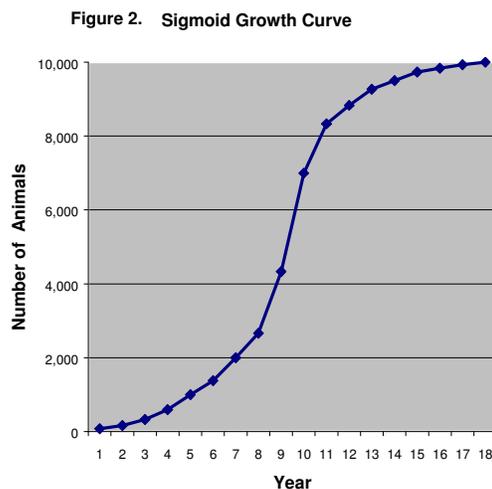
- Harvest estimates determined from harvest surveys
- Post-hunt herd composition (bull:100cows and calves:100cows) ratios determined by aerial classifications
- Estimated wounding loss, illegal kill, and survival based on field research and observations.

Population objectives and herd composition ratios both influence and are influenced by current population size, carrying capacity, harvest, reproduction and survival, viewing opportunity, and hunter success. Bull:cow ratios influence hunter opportunity, hunter density, bull harvest, trophy potential, and hunter success.

### Population Dynamics and Managing For Sustained Yield

Big game populations grow in a mathematical relationship referred to as the "sigmoid growth curve" or "S" curve (Figure 2). 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. This occurs because the populations may have too few animals and the loss of even a few of them to predation or accidents can significantly affect the population.

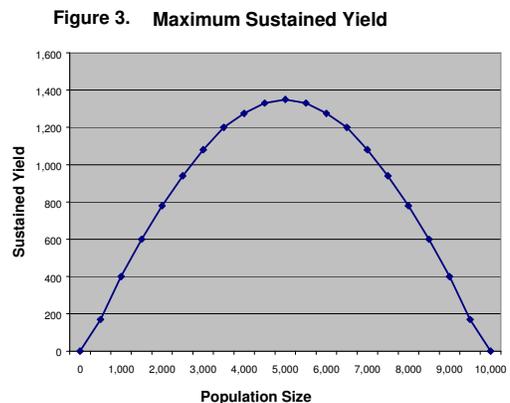
The second phase occurs when the population number is at a moderate level. This phase is characterized by a very high reproductive and survival rate. During this phase, food, cover, water and space are not limiting factors. Survival rates are



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. This phase is characterized by a decrease in reproduction and survival. During severe winters, large die-offs can occur due to the crowding and lack of food. The first to die during these situations are calves, then bulls followed by the adult cow elk. The severe winters thus affects the future bull to cow ratios by favoring more cows and fewer bulls in the population. Also, since the quality of a bull's antlers is somewhat dependent upon diet quantity and quality, antler growth may be reduced during this phase. If the population continues to grow, it will eventually reach a point called "K" or the maximum carrying capacity. The level is not static but varies from year to year based upon such factors as the severity of the winter. At this point, the population reaches "equilibrium" with the habitat. The number of births each year approximately equals the number of deaths, therefore, to maintain the population at this level would not allow for any "hunnable surplus." The animals in the population would be in relatively poor condition and when a severe winter or other catastrophic event occurs, a large die-off is inevitable.

In an attempt to manage for healthy big game herds, managers should attempt to hold the populations around the middle of the "sigmoid growth curve or even slightly above this point." Biologists call this "MSY" or "maximum sustained yield." At this level, which is approximately half the maximum population sizes or "K", in this example it would be 5,000 animals, the population should provide the maximum production, survival and available surplus animals for hunter harvest. Also, at this level, range condition should be good to excellent and range trend should be stable. Game damage problems should not be significant and economic return to the local and state economy should be at the maximum. This population level should produce a "win - win" situation to balance sportsmen and private landowner concerns.



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

elk level, there will be less game damage, low resource utilization, and fewer watchable wildlife opportunities.

## **DESCRIPTION OF THE DATA ANALYSIS UNIT**

### **Location**

The Williams Fork Elk DAU (E-13) is located in north-central Colorado and consists of GMUs 28, 37 and 371 (Figure 4). It is bounded on the north by the Colorado River, Lake Granby and Arapaho Creek, on the east and south by the Continental Divide, and on the west by the Gore Range and Eagles Nest Wilderness Divide. This DAU takes in the southern half of Middle Park, and includes all of Summit County and about half of Grand County.

Major towns include Breckenridge, Dillon, Fraser, Frisco, Granby, Hot Sulphur Springs, Silverthorne, and Winter Park. Kremmling and Grand Lake lie just outside the DAU boundary. Interstate 70 transverses the southern part of the DAU from the Eisenhower Tunnel to Vail Pass. The DAU includes all of the Blue River, Fraser River and Williams Fork drainages.

### **Topography**

Middle Park is a large basin surrounded by high mountain ranges. As an inter-mountain park it is unique in two respects. It does not have the level interior characteristic of other large mountain parks in Colorado, such as North Park and South Park, and it lies west of the Continental Divide. All natural surface drainage for this area funnels through Gore Canyon, downstream from Kremmling. The elevation reaches 14,270 feet above sea level on Grays Peak near Loveland Pass. The Gore Range and Tenmile Range both have peaks that rise above 13,000 feet in elevation, as does the Continental Divide.

Once snow accumulation forces big game animals down to the valley floor in the winter, they become trapped in the park by Gore Canyon and they are unable to migrate out of the valley. The valley floor at Kremmling is 7,300 feet in elevation, making it one of the higher elk winter ranges in Colorado. However, interior mountains, such as Wolford and Junction Butte, provide excellent southern exposure for critical big game winter range.

### **Climate**

Weather in Middle Park varies greatly depending on location and altitude. In general, the climate is cold and the majority of annual precipitation falls as snow. Drought years occur with some regularity. During winter when there is no wind, cold air becomes trapped by the surrounding mountains, causing extreme temperature inversions. The town of Fraser is consistently one of the coldest spots in the lower 48 United States and once was promoted as the "Ice Box of the Nation." During the middle of winter, nighttime low temperatures in the minus 20-degree Fahrenheit range are to be expected, and can drop much further. Temperatures below minus 50-degrees Fahrenheit have been recorded.

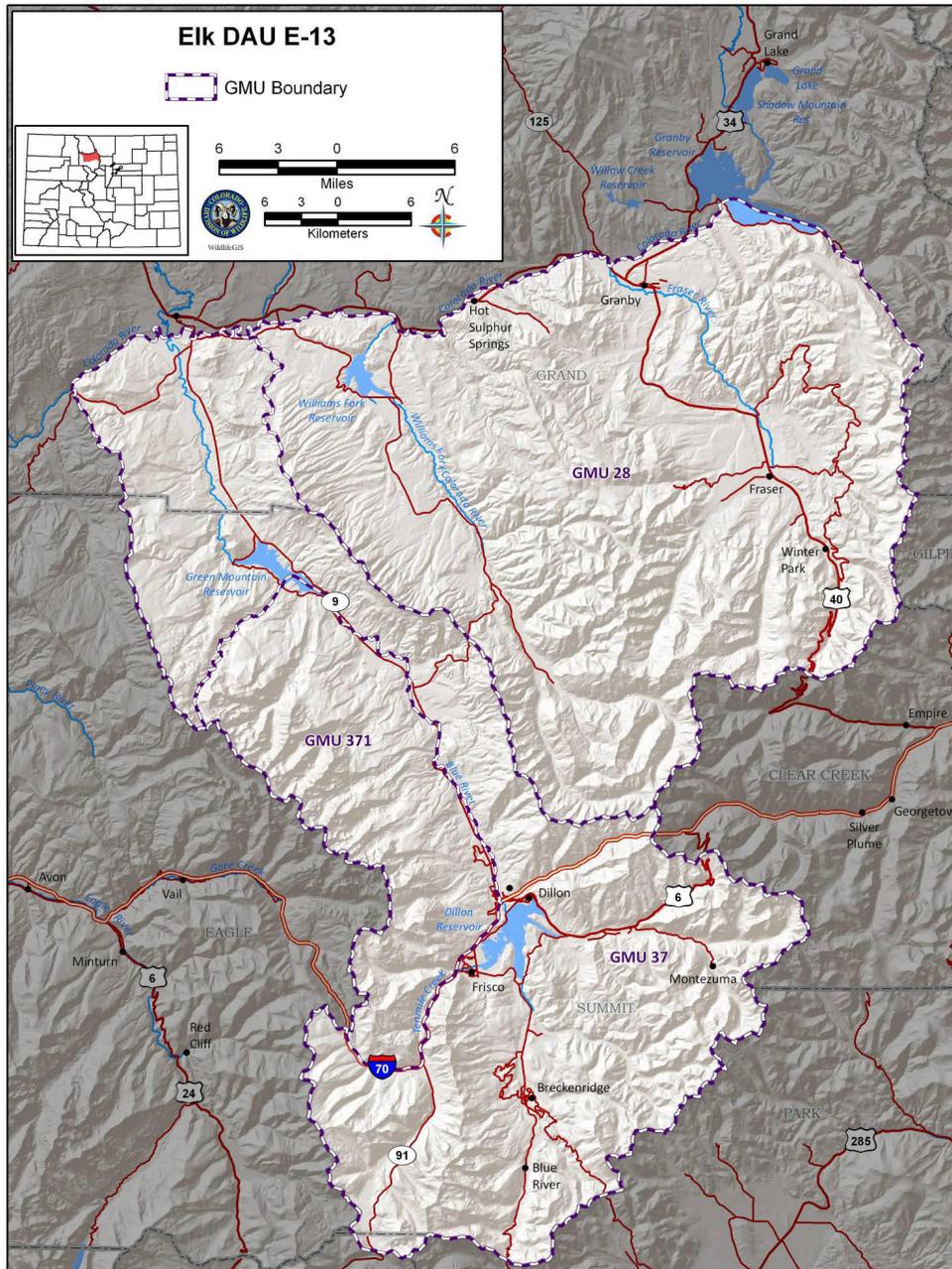


Figure 4. Figure shows DAU E-13 boundaries, GMU's, and towns.

The summer growing season is extremely short and variable. Snow showers may even strike in the summer at higher elevations. Lower elevations may have daytime temperatures reaching into the 90-degree Fahrenheit range; however, valleys become significantly cooler than uplands during the night as colder air settles. Fraser has an annual average of only six frost-free days.

Local topography also affects the amount and type of moisture. Kremmling lies in the "rain

shadow" of the Gore Range and only averages about 11 inches of moisture per year; whereas at Fraser, where prevailing winds push clouds up against the Continental Divide, average precipitation is approximately 20 inches. Thunderstorms occur almost daily during the summer along the Continental Divide.

Most of the moisture that falls in the area comes during the period of October to late April. Snow blankets the area during the winter and accumulations of 30" are typical at the 9,000-10,000 foot level. Deer and elk move to lower elevations as snow accumulates, seeking out south facing or wind-blown slopes. At high elevations upwards of 20 feet of snow can fall over the course of winter. In the valleys, sunny winter days and/or windy conditions cause snow to disappear on exposed slopes.

### **Vegetation**

Vegetation in Middle Park can be categorized into five broad types – cropland, wetland/riparian, rangeland, forestland and alpine (Figure 5). The variety of vegetation types scattered throughout Middle Park creates a highly desirable mosaic very beneficial to wildlife. However, plant communities at lower elevations are becoming increasingly disturbed by intensive human use.

Croplands consist of irrigated hay meadows and terraces that have been re-seeded to desirable forage plants. Most hay ground is "native hay," consisting of timothy and smooth brome, with sedges and some rushes. A few hay meadows have been seeded to alfalfa.

Wetlands and transition riparian occur along the river bottoms and irrigated meadows. The most extensive riparian habitat lies along the Colorado River between the towns of Granby and Kremmling. This area is dominated by narrowleaf cottonwood and willow. The riparian habitat is one of the least represented vegetative types in Middle Park but is extremely valuable as wildlife habitat. It supports the greatest abundance and diversity of wildlife.

Rangelands consist of sagebrush steppe, mountain shrub and grassland communities. The sagebrush community is by far the most common rangeland in Middle Park at elevations up to 9,000 feet. It is found on drier non-agricultural areas on the valley floors and the lower hills. Mountain shrub, consisting of big sagebrush mixed with serviceberry, chokecherry and antelope bitterbrush, is found on better soils at lower elevations. This plant community is not widely represented in Middle Park but provides important wildlife food and cover. Both sagebrush steppe and mountain shrub have grass and forb understories, making them suitable for rangeland. Bluebunch wheatgrass is prominent in these vegetative types under good range conditions.

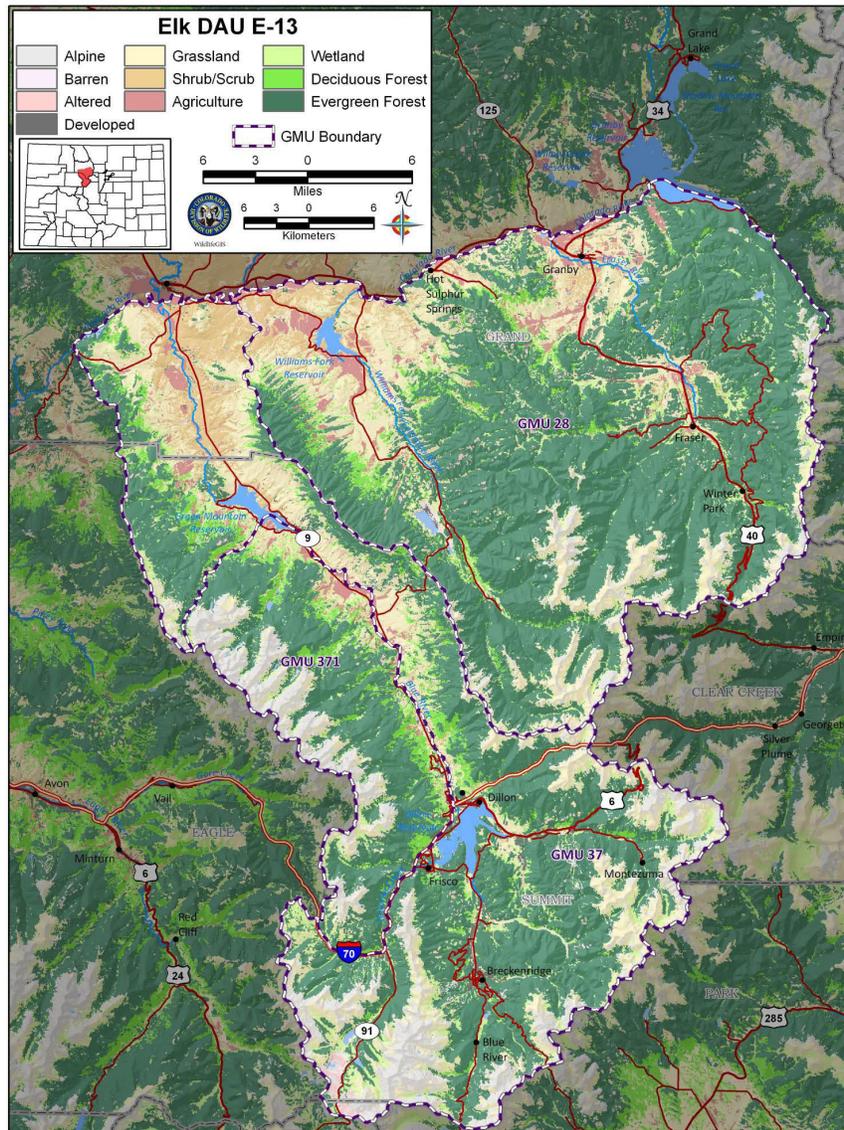


Figure 5. Figure shows vegetation types within E-13

Native grasslands are found in two different sites: mountain meadows, consisting of grasses, forbs and some shrubs, occur at higher elevations in association with lodgepole, aspen and spruce-fir forest type; and low elevation grasslands occurring on windswept sites with poorly developed soils incapable of supporting sagebrush.

Forestlands in Middle Park can be subdivided into four major types: piñon-juniper, lodgepole pine, aspen, and spruce-fir. Piñon-juniper woodlands are found on some of the lower slopes. Piñon-juniper provides cover during the winter, along with low quality forage.

Lodgepole pine is the most widely distributed forest type. This species typically occurs in even-aged stands at elevations between 7,500 feet and 10,500 feet. The mountain pine beetle (MPB)

has impacted these lodgepole pine forests within the past decade and the majority (over 90%) of the mature lodgepole pine stands have been reduced to a large landscape of standing dead trees with a grass/forb understory that did not occur previously. MPB affected lodgepole pine forest is showing an increased use by elk throughout the year, but most noticeably during fall, spring, and average winters due to the increased grass/forb understory. Prior to the MPB outbreaks, dense overstory of lodgepole pine provided little forage for elk, but was important from the standpoint of cover.

At higher elevations, Engelmann spruce and subalpine fir regularly occur in uneven-aged stands. This habitat provides excellent summer cover for deer and elk. Aspen stands usually are found in areas with better soil moisture, or in areas of less severe exposure at elevations up to 10,500 feet. The understory in aspen typically consists of vigorous herbaceous and shrub growth. This forest type is attractive to a variety of wildlife and provides important cover and forage for big game animals. On some sites aspen is the climax species; on other sites it is a transitional species that occurs for only a relatively short period of time after a disturbance, such as fire. Douglas-fir, ponderosa pine and limber pine forest types also occur in Middle Park, but to a lesser extent.

The alpine community occurs above 11,000 feet in elevation. This community is dominated by stunted Engelmann spruce and subalpine fir giving way to forbs, grasses and sedges. Low growing plants are typically nestled among lichen-covered rocks. In those protected areas blanketed by snow during the winter, and kept moist by melting snow banks during the summer, thickets of bog birch and willows can exist. Alpine sites provide high quality elk forage from July through early September.

**Land Status**

The DAU covers a total of 859,293 acres. Of this area, 65% is administered by the USFS, 26.5% is privately managed, and 5% is under the jurisdiction of the BLM (Figure 6). The State of Colorado (State Land Board and CDOW) administers slightly less than 2% of the land area in the DAU. The Junction Butte and Hot Sulphur Springs State Wildlife Areas (SWA), along with portions of the Kemp-Breeze SWA, are managed to provide winter habitat for deer and elk. Large reservoirs (Williams Fork Reservoir and Dillon Reservoir) along with the associated water diversions and collection systems account for 1% of the land management (NGO). Land management is categorized in Table 1.

**TABLE 1**  
Land management in DAU E-13 by GMU shown in acres.

GMU	PRIVATE	CITY/COUNTY	NGO	CDOW	SLB	USFS	BLM	TOTAL
28	121,897		8,003	11,755	1,666	250,258	27,330	420,908
37	90,392	4,338	746	1,552		214,785	17,363	329,179
371	15,661	133	34	21		93,356		109,205
<b>TOTAL</b>	<b>227,950</b>	<b>4,471</b>	<b>8,783</b>	<b>13,327</b>	<b>1,666</b>	<b>558,399</b>	<b>44,692</b>	<b>859,293</b>
<b>PERCENT</b>	<b>26.5%</b>	<b>.5%</b>	<b>1%</b>	<b>1.6%</b>	<b>.2%</b>	<b>65%</b>	<b>5.2%</b>	<b>100%</b>

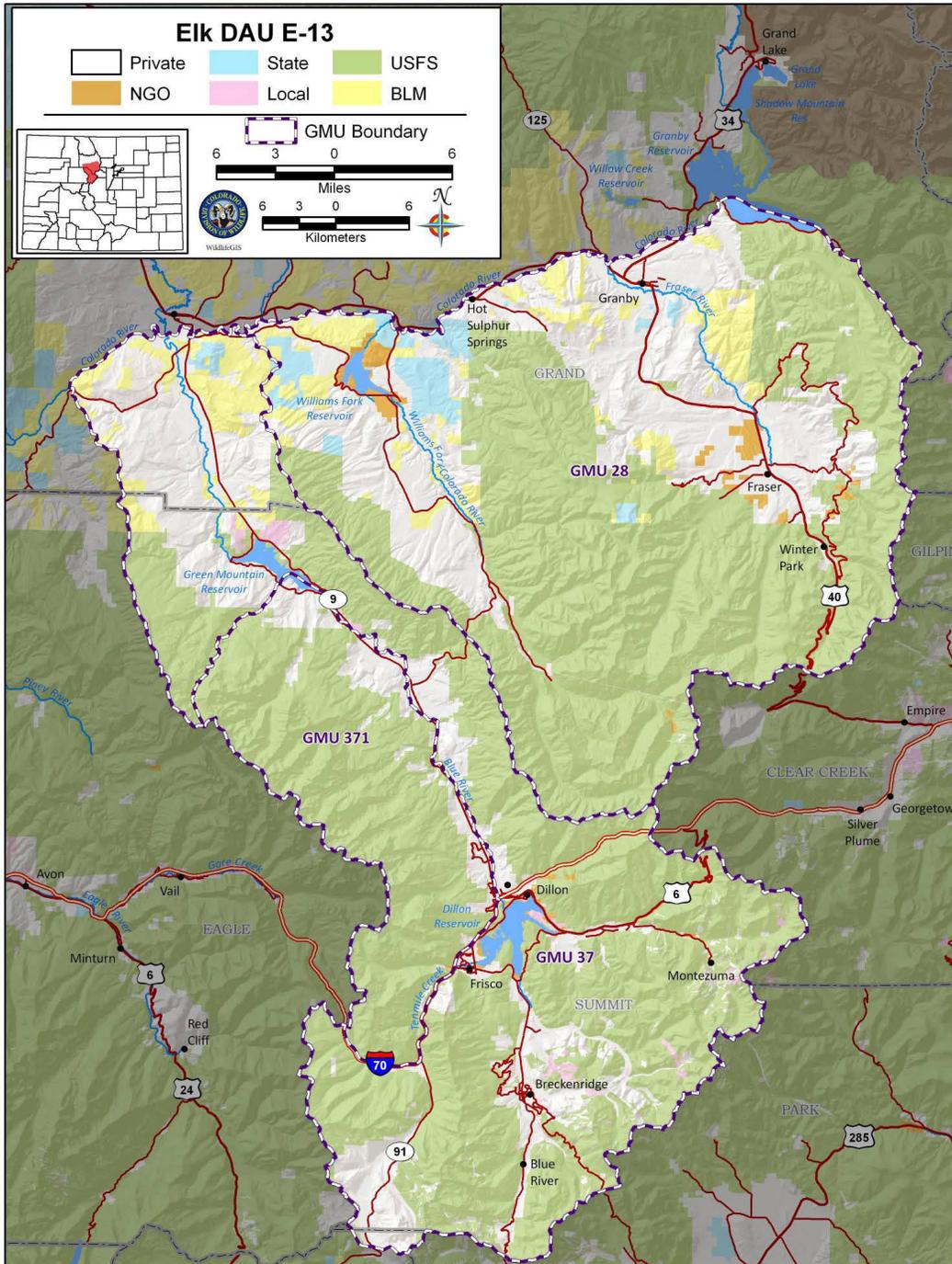


Figure 6. Figure shows land management status.

**Land Use**

The main industries in E-13 are recreation and ranching. Highly-developed mountain

communities occur in the areas surrounding Breckenridge, Dillon, Frisco, Granby, Silverthorne, and Winter Park. The Sulphur Ranger District of the Arapaho/Roosevelt National Forest, the Dillon Ranger District of the White River National Forest, and the Kremmling Resource Area of the BLM administer federal lands within the DAU. Recreation, livestock grazing and wildlife production are the predominant uses of USFS and BLM lands, with timber harvest occurring in areas where there are suitable forest products; other activities such as right-of-way administration, mineral production, watershed protection and cultural resource protection are common to the two agencies.

The area within this DAU provides extensive opportunities for winter recreation – skiing and snowmobiling in particular. There are six downhill ski areas (Arapahoe Basin, Breckenridge, Copper Mountain, Keystone, Sol Vista, and Winter Park/Mary Jane). In addition, two major nordic areas are within this DAU (Devil’s Thumb Ranch Resort and Snow Mountain Ranch/YMCA of the Rockies). Major ski areas have large base developments associated with offsite condominiums, homes and commercial facilities. Most of these ski areas are destination resorts which furnish year-round recreation opportunities including biking, golfing, horseback riding, fishing, boating and hiking. Because of their proximity to Denver, these communities have been developed with numerous recreational homes and cabins.

Grand and Summit counties are also popular destinations for summer recreationists, with numerous campgrounds, dude ranches and other resorts. Reservoirs built for water storage, including Lake Dillon, Green Mountain Reservoir and Williams Fork Reservoir, provide good fishing, along with opportunities for recreational boating. Rafting companies offer trips down the Colorado River, and local rivers also provide opportunities for kayaking. All, or portions, of Byers Peak, Eagle Nest, Ptarmigan Peak, and Vasquez Peak Wilderness Areas are located within the DAU.

Big game hunters can hunt deer, elk, moose, black bear, pronghorn, bighorn sheep, mountain goat, and mountain lions. Waterfowl, small game, and upland hunting opportunities also occur in this area. Good fishing is provided by several Gold Medal streams, three large reservoirs and numerous high lakes. Hunters and anglers make substantial contributions to local economies. Hunting contributes over 28 million dollars annually to the local economy with over 8 million dollars from out of state hunters (BBC Research and Consulting 2008)<sup>a</sup>. People who take trips to observe and photograph wildlife also buy gas, groceries and other supplies, substantially impacting both destination areas and retailers along travel routes.

Most of the molybdenum used in North America is produced in this part of Colorado. Climax Mine operates north of Leadville. Ore mined in Clear Creek County is transported via an underground conveyer belt to be processed at the Henderson Mill on the Williams Fork drainage.

Besides providing recreational opportunity, undeveloped lands in the DAU are also utilized to raise livestock. Most livestock operations are cow-calf enterprises. Most livestock are pastured

---

<sup>a</sup> [BBC Research and Consulting. September 2008. The Economic Impacts of Hunting, Fishing, and Wildlife Watching in Colorado. Final Report. 22pp.](#)

on USFS or BLM allotments during summer months. Private lands are used for hay production and winter pasture.

## HABITAT RESOURCE

DAU E-13 contains approximately 251,723 acres of elk winter range, 69,267 acres of severe winter range and 85,198 acres of elk winter concentration areas (Table 2). Severe winter range is defined as the area of winter range where 90% of the elk will be confined during the worst two winters out of ten. Winter concentration areas are defined as areas on the winter range that have a density of at least 200% more elk than surrounding areas. The majority of the winter range occurs on private land (approximately 40%), followed by USFS lands (approximately 35%) and then BLM land (approximately 20%). State Land Board lands and CDOW lands make up the balance of approximately 5% (Figure 7).

**TABLE 2**  
DAU E-13 elk winter use shown in acres

GMU	Overall	Winter Range		Winter Concentration		Severe Winter Range	
	Acres	Acres	% of Overall	Acres	% of Overall	Acres	% of Overall
28	420,908	100,328	24%	50,148	12%	30,681	7%
37	329,179	123,753	38%	27,063	8%	35,876	11%
371	109,205	27,642	25%	7,986	7%	2,711	2%
<b>TOTAL</b>	<b>859,293</b>	<b>251,723</b>	<b>29%</b>	<b>85,198</b>	<b>10%</b>	<b>69,267</b>	<b>8%</b>

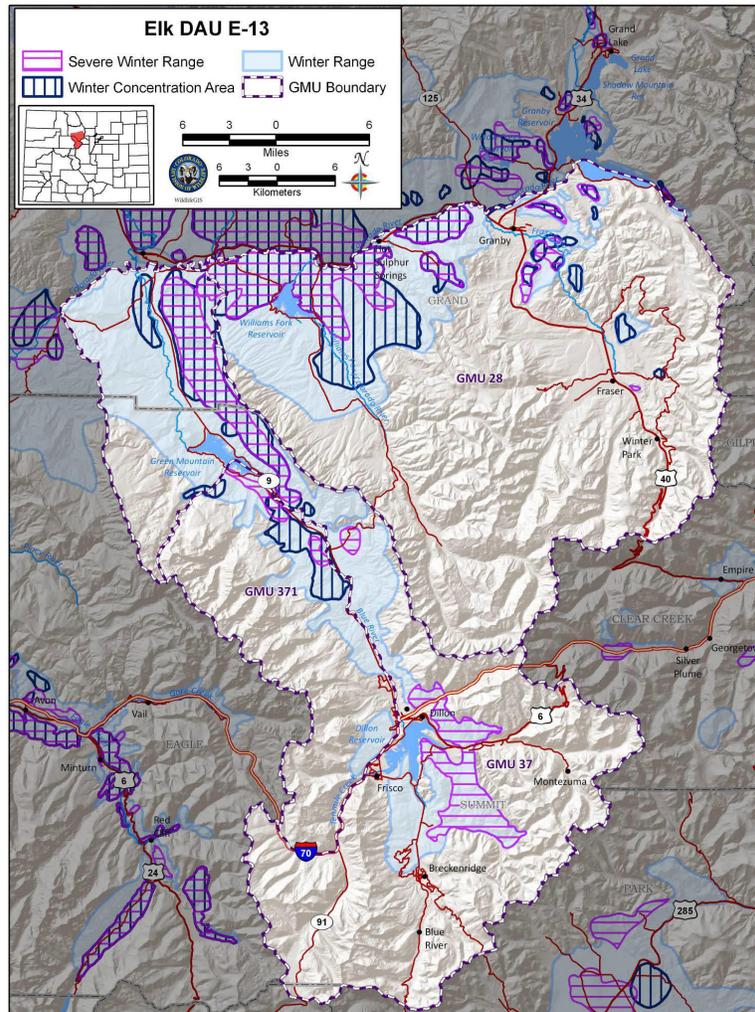


Figure 7. Figure shows E-13 elk winter activities

Protection of elk winter ranges is a priority in E-13. Of the private property in E-13, 52% (118,454 acres) lies within elk winter range. Conservation easements protect 15,580 acres of private property held by a number of groups including Middle Park Land Trust, Continental Divide Land Trust, Summit County, American Farmland Trust, Colorado Open Lands, and the Colorado Cattleman’s Agricultural Land Trust. The DOW manages 8,263 acres of private property held in conservation easements (Figure 8). Within the private land held in conservation easements, 18,640 acres are within elk winter range, 11,309 acres are within elk winter concentration areas, and 4,776 acres are within elk severe winter range.

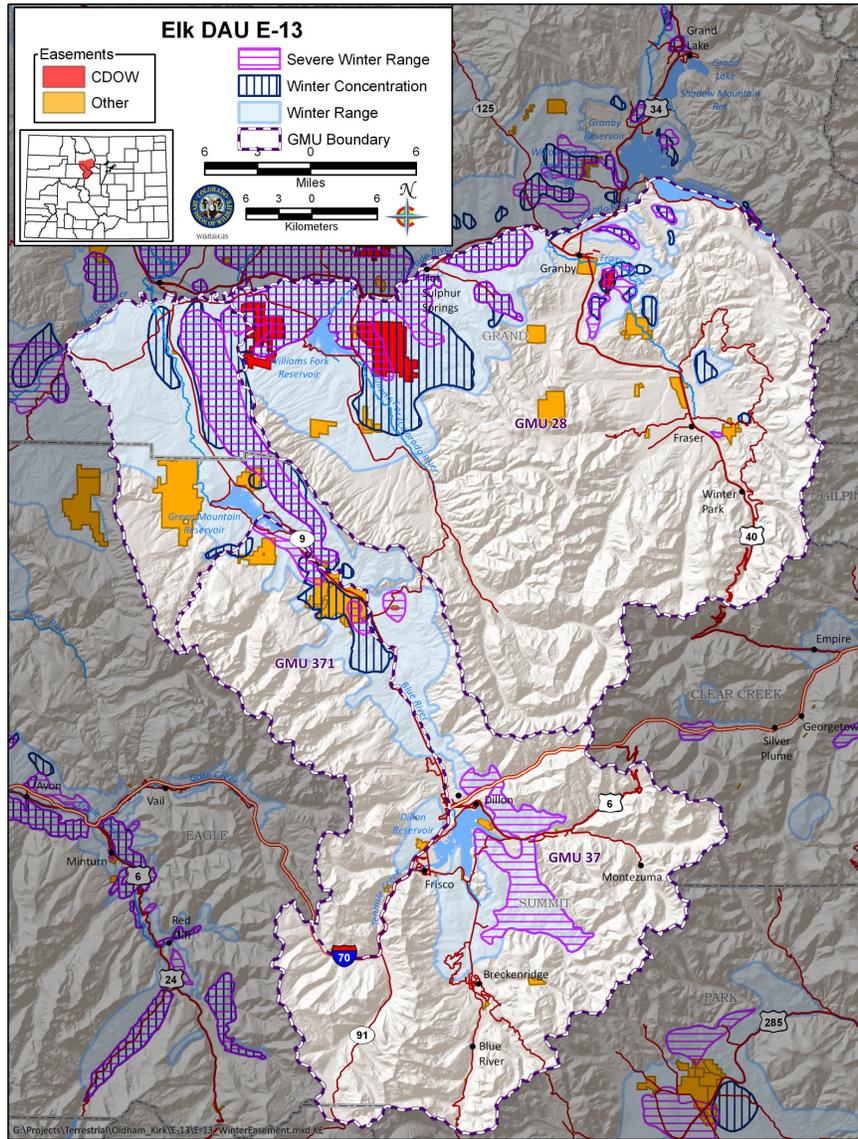


Figure 8. Figure shows private lands protected by conservation easements

**Public Lands**

**USFS**

The USFS manages 43 grazing allotments within DAU E-13. Of these allotments, 22 have been closed and 14 of these are vacant – not being used by domestic livestock at this time. The remaining 7 allotments provide/occupy 52,000 acres. The period of utilization is variable, but primarily occurs from late June through September. Classes of livestock using these allotments include cattle, horses and sheep.

Standing forage, security cover, road access and the juxtaposition of these attributes largely determine the quality of elk habitat. Habitat conditions on USFS lands are adequate to meet the needs of the current population in the DAU. Habitat diversity is high throughout the area, providing good forage:cover ratio. Forage condition is fair to good overall. Livestock graze most of the northern portion of this DAU. Competition between cattle and elk does not appear to be a problem, based on the fact that adjustments in allotment management plans have not occurred because of wildlife impacts. Roads are sometimes closed to travel, at least seasonally, on both winter and summer ranges.

Approximately 35% of winter range in this DAU is on USFS lands. There is concern that elk and cattle may be heavily impacting grazing allotments along the Blue Ridge due to year-round use (livestock during the growing season and wildlife during the winter). Small scale burning projects on some allotments are currently under consideration to mimic natural processes and increase the amount of forage.

Recreation receives emphasis on both the Dillon and Sulphur Ranger Districts. Extensive trail systems provide access for mountain bikes and hiking. Road systems developed for logging, or remaining from historic hard rock mining activity on the Dillon District, are heavily used by motorized off road enthusiasts.

## **BLM**

The BLM has 42 allotments in the DAU. These provide 5,438 AUMs of forage for livestock, with use occurring primarily in the spring and fall, although some use occurs in summer and winter. The class of livestock using these allotments is almost exclusively cattle and horses.

During the years 2000 through 2003, Middle Park experienced a severe drought which affected vegetative productivity on the sagebrush rangelands. All animals, domestic and wildlife, were impacted by the decrease in vegetation production in the drought stricken areas. Livestock grazing permittees were asked to voluntarily reduce livestock numbers on BLM rangelands during the 2001 and 2002 grazing seasons due to the drought conditions. AUMs were reduced about 40% during these two grazing seasons on BLM allotments in Middle Park. The 2003 grazing season was a better moisture year than the two previous years; however, livestock numbers were less than permitted on BLM allotments since most operators had not increased their herd sizes to pre-drought numbers and to allow vegetation to recover from the drought. In 2004, the Kremmling Field Office sent a letter to grazing permittees warning of another potential reduction in grazing due to dry conditions, however no changes were required.

The BLM's Kremmling Resource Management Plan emphasizes the management, production and use of renewable resources on the public lands in the Williams Fork DAU. Sustained yield and multiple uses are primary tenets of this management philosophy. Range forage has been allocated to optimize both livestock production and big game populations wherever feasible. In grazing allotments where optimizing for both was not possible, livestock production was favored while providing sufficient forage to support 1980 big game levels.

Range monitoring results, funded by the Habitat Partnership Program (HPP), have indicated that BLM rangelands have been able to support the numbers of big game animals and domestic livestock which have been grazing them for the past 15 years. There is some concern with the number of big game, especially elk, inhabiting BLM rangelands during winter in recent years. However, neither the BLM nor HPP studies have documented range forage damage on public land caused by elk or other big game animals. The CDOW has decreased the elk population, in the past 10 years, in most parts of Middle Park. The number of livestock grazing BLM land has decreased in the past 20 years due to changes in land ownership and in the uses of these private lands. Less livestock grazing has resulted in more forage available for wildlife, especially for big game animals in Middle Park.

### **Private Lands**

While game damage claims with private property owners within DAU E-13 are minimal, there is intermittent damage of crops, fences, and haystacks by elk. Occasionally elk compete with livestock for spring forage, damage aspen trees, and have other impacts on privately owned habitat in parts of DAU E-13. Wintertime concentrations of elk on private property sporadically lead to conflicts, with regard to cattle feeding operations. Most hay storage areas are permanently fenced to keep elk out. The CDOW has provided materials for this protection. The 10-year average annual game damage payment in E-13 is \$150 with an overall average annual game damage payment since 1995 in E-13 of \$857. These numbers exclude the \$76,112 payment in the fall of 1997 for a spinach damage claim near the Granby area. Subsequently, the CDOW provided \$3,857 (between 1997 and 2005) in game damage prevention materials to the landowner. The 5-year average game damage material payment is \$1667 with an overall average game damage material payment of \$2054 since 1999. The CDOW also has purchased pyrotechnics and temporary elk panels to provide to landowners having conflicts with elk. These materials have cost an average of \$220 annually for pyrotechnics and \$699 annually for elk panels in Middle Park (E8, E13, and parts of E-7 and E-12).

Whenever damage to livestock fencing or forage occurs, or that potential exists, the Middle Park HPP Committee has typically become involved in the resolution of these conflicts. Aerial fertilization of elk habitat on public lands has been used with some success to attract animals away from private rangelands. In addition, HPP funds have been used to construct a high-tensile livestock fence in an area where perennial fence damage was occurring, and also to provide materials for "Middle Park Gates." Landowners are encouraged to install these metal gates in existing travel corridors of elk. These can then be left open during times when cattle are not being pastured, and elk seem willing to go out of their way to use these gates when they aren't hurried. HPP has also paid to build several high-tensile division fences to improve grazing management of BLM allotments, and has been involved in improving grazing practices in other ways, such as water development. Distribution management hunts, where landowners are allowed to bring in hunters of their own choosing when elk are causing conflicts during the period from August 15-January 30 (excluding regular hunting seasons), have also proven useful in reducing damage. An average of 51 licenses for distribution management hunts have been issued annually since 2000 for ranches in E-13 with an average harvest of 29. In situations

where elk take spring forage intended for cattle use because snow prevents them from moving onto National Forest, HPP can make lease payments for pasture if there is nowhere else for the elk to be at that time of year.

HPP has continued to support measuring the condition of rangeland vegetation and utilization of this vegetation by big game animals in the area of their jurisdiction. HPP has funded a variety of activities which were designed to measure big game forage utilization levels on important winter ranges in Middle Park. Beginning in the early 1990's, wire cages were set out on numerous locations in heavy winter use areas and then the amount of forage on key species removed by big game was compared to protected plants of the same species inside the cages. These measurements were made as soon as the cages were accessible in spring when big game animals had moved from the cage locations. These studies, over the course of four years, indicated elk use of key grass species varied from 30% to 60%. These use levels did not appear to damage the grazed plants and in normal growing seasons, the growth of grazed plants soon caught up with the growth of adjoining ungrazed plants. Data regarding the location of the cages and the estimated utilization levels of forage plants at each cage site are recorded in the Kremmling Field Office of the BLM.

HPP has also funded measurements in the Middle Park area which were used to estimate overall condition of rangeland vegetation on important big game winter habitat. Individuals were contracted by the HPP to measure vegetation in various locations throughout Grand County using techniques similar to those measured by BLM range specialists. Numerous trend transects were established, mostly in sagebrush steppe vegetation, and vegetation attributes such as canopy cover, plant composition, and key plant frequency were monitored. This monitoring was carried out in Middle Park in 1999, 2000, and 2001. Only a few trend transects were performed in 2002 and none were done in 2003.

## **HERD MANAGEMENT HISTORY**

Elk were plentiful in Middle Park in pre-settlement times, but were soon exploited when Europeans began arriving on the scene. Market hunters supplied mining camps near Leadville and in Clear Creek and Summit Counties with wild game meat. Later, thousands of elk were shot throughout Colorado for just their teeth. The disappearance of elk brought about closed seasons from 1902-1928. In 1913, it is estimated that only 50 head remained in the entire upper Colorado River Basin (500-1000 in all of Colorado). Between 1912 and 1928 there were fourteen reintroductions in Colorado totaling 350 animals. (The Elks Lodge was instrumental in getting these done). One such transplant occurred at Estes Park in 1913, with 36 elk from Yellowstone; another release occurred near Steamboat Springs. During the late teens and twenties the entire Williams Fork drainage was maintained as an elk refuge. Williams Fork drainage reopened in 1929 when damage occurred on local ranches (300 animals were killed that year). In 1932, feeders were hired to try and lure elk from the vicinity of Windy Gap, over Cottonwood Divide to the Beaver Creek valley, where they planned to hold them for the winter. This was unsuccessful. Elk numbers in E-13 have been gradually increasing since the turn of the

century, and elk are now a prominent feature of the local fauna.

### Posthunt Population Size

Except for a few years, the Williams Fork elk herd has been steadily increasing for most of this century. Computer modeling indicates the herd may have leveled off in the late 1990s, followed by a decline in the 2000s (see Figure 9). The highest posthunt population estimate for the DAU was 8,960 elk in 1990. The lowest population estimate, based on recent records, was 709 elk in 1954. Since 1981 the estimated average population has been 7,000 animals. The last ten years (2000 – 2009), the population has averaged 5,800 animals. The 2009 posthunt population estimate is approximately 4,700 elk.

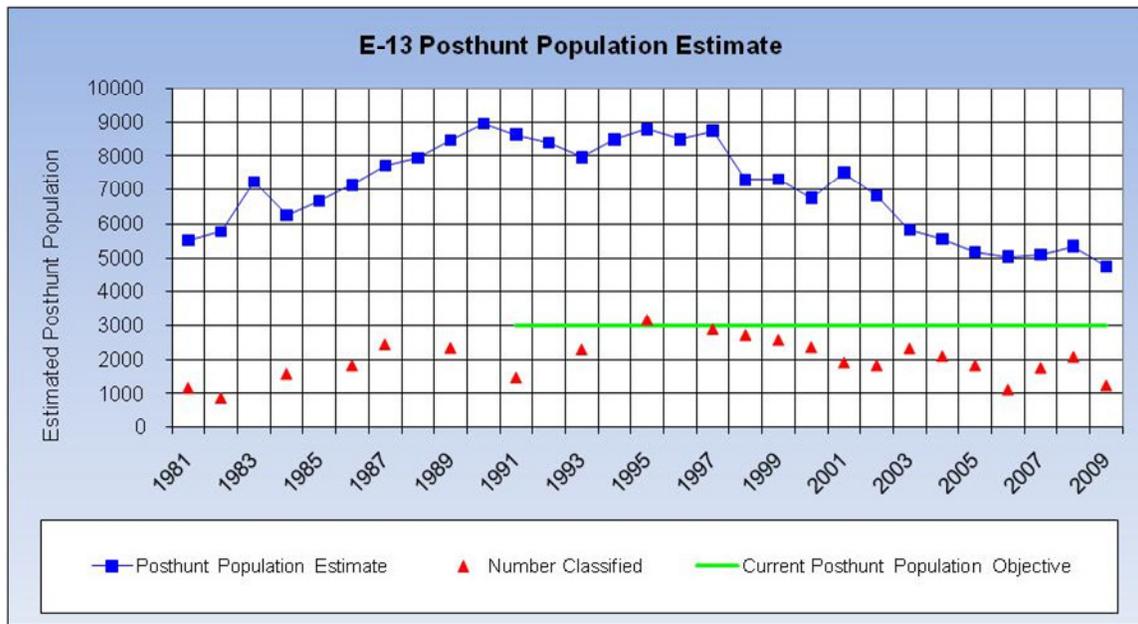


Figure 9. E-13 Posthunt Population Estimate.

The closest thing to an elk census in recent years occurred during the winter of 1995-96 when the Middle Park HPP Committee contributed money for additional helicopter flights. Near ideal counting conditions were present during February of that year after a heavy snowfall with very little wind and no drifting. Elk began to move to lower elevations and into habitat with less tree cover, and congregated in groups that averaged slightly more than 21 elk in size. The solid snow cover greatly increased the visibility of animals and made tracking from the air possible. A total of 31 hours of flight time were spent counting and classifying elk in Middle Park. Photographs were taken of some of the larger groups to ascertain the degree to which undercounting was occurring. The total number of elk accounted for in E-13, after adjusting for sightability and counting error in large groups, was 4,102. However this figure does not reflect elk that had migrated out of the DAU for the winter, such as to South Park or Radium, or those elk that may have been in areas that were not surveyed.

### Posthunt Herd Composition

The first documented herd composition surveys in the Williams Fork elk herd were conducted in 1972. Since 1981, the CDOW has conducted 22 posthunt calf to cow ratio and bull to cow ratio classifications. Over this time period sex ratios have averaged 26 bulls:100 cows with a range of 18 to 46 bulls:100 cows. The past 10-year average is 31 bulls:100 cows, with a range of 23 to 46. The past 5-year average (2005-2009) is 33.6 bulls:100 cows. The 2009 classification revealed an unusually high bull ratio of 46 bulls:100 cows. This was the highest observed bull ratio since 1981. Bull cow ratios are shown in Figure 10.

The bulls:100\_cow ratios in this herd have consistently been in the lower 20s, without any restriction on hunter numbers or season-long antler point restrictions. The numerous refuge areas in the DAU, where there is effectively no hunting, help retain more bulls in the population. The ratio dipped in the early 1980s, probably as a result of very heavy elk hunting pressure on bulls while antlerless harvest was being kept in check. From 1986 to present, CDOW has been using the four-point antler restriction to protect yearling bulls from harvest. There have also been a large number of antlerless licenses issued for this DAU this past decade. The combination of these factors has allowed the bull ratio to increase.

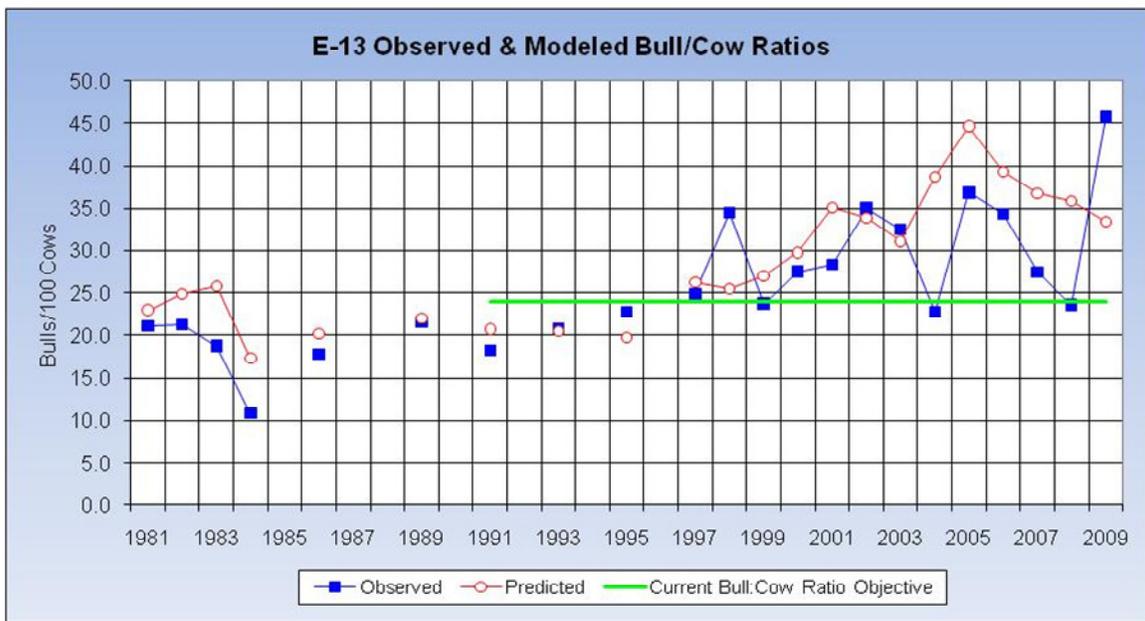


Figure 10. E-13 Sex Ratios.

Posthunt age ratios (calves:100 cows) are measured at the same time as the bull:cow ratios – early in the winter. These give some indication of the reproductive success of the elk herd but, depending on severity of the winter, may not accurately reflect recruitment of young elk into the population (*i.e.*, those animals surviving to one year of age). Significant mortality of young elk can occur between the time of the counts and May.

Posthunt calf:cow ratios have been more variable than bull:cow ratios. Since 1981 the average calf:cow ratio has been 52 calves:100 cows (range: 38 in 2006 to 64 in 1983 and 1998). Since 2000, the calf:cow classifications have averaged 49 calves:100 cows. Figure 11 graphs the calf

to cow ratios in E-13.

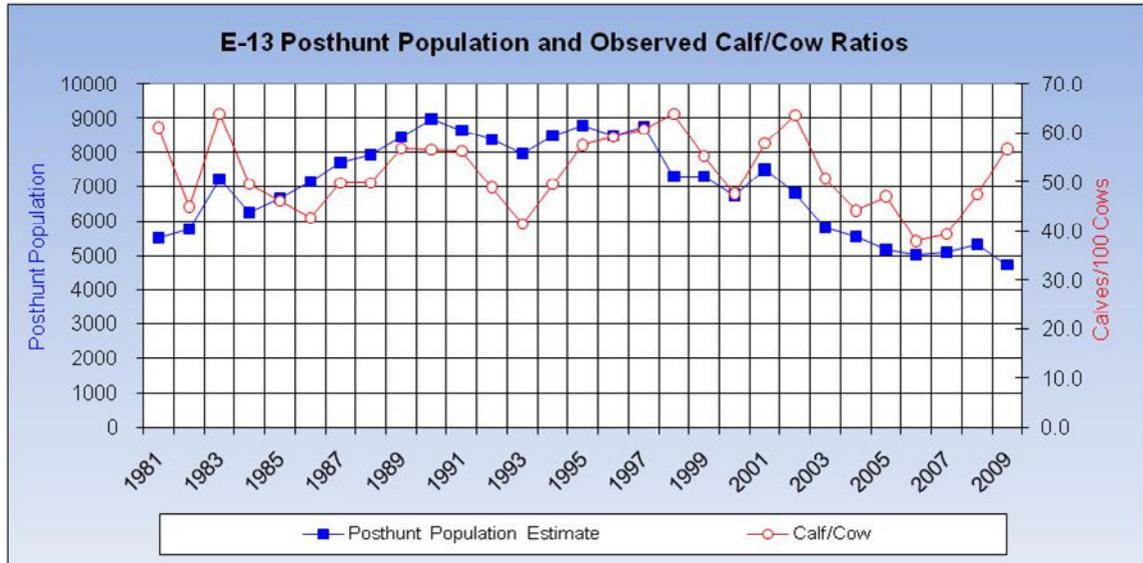


Figure 11. E-13 Age Ratios.

**Other Management Activities in DAU E-13**

Hunters in the 1989 game damage season and subsequent distribution management hunts were required to submit the lower jaw and uterus from harvested cows. CDOW has maintained records of pregnancy rates, fetal sex ratios and age structure of the harvest from these biological samples, and has also estimated dates of conception and parturition from measurements of the fetuses. Through the years 941 jaws have been aged and 815 uteri have been examined. Pregnancy rates in Middle Park elk have averaged 90% for animals 2½ years of age and older and 31% for yearlings. Two to three percent of the cows harvested appeared to have been 15 years of age or older and one of these animals had twin fetuses (the only incidence of twinning detected).

**Harvest History**

Bull harvest steadily increased in the Williams Fork DAU from the 1950s until the late 1980s. Antlerless (cow and calf) harvest has increased dramatically from a low of 21 in 1957 to 889 in 1996. In the 1950s, total harvest averaged 125 elk per year; this rose to 260 in the 1960s, 409 in the 1970s, and 830 in the 1980s. Since 1985, the low antlerless harvest was 179 in 1985 and the high was 1097 in 1998 (Figure 12). The mean antlerless harvest from 1985 to 2009 was 608. Since 1985, the lowest bull harvest was 327 in 2009; the highest was 685 in 1992; and the mean bull harvest between 1985 and 2009 was 501. The combined antlerless and bull harvest since 1985 was a low at 556 in 1986 and high in 1998 at 1623. The mean harvest between 1985 and 2009 was 1113.

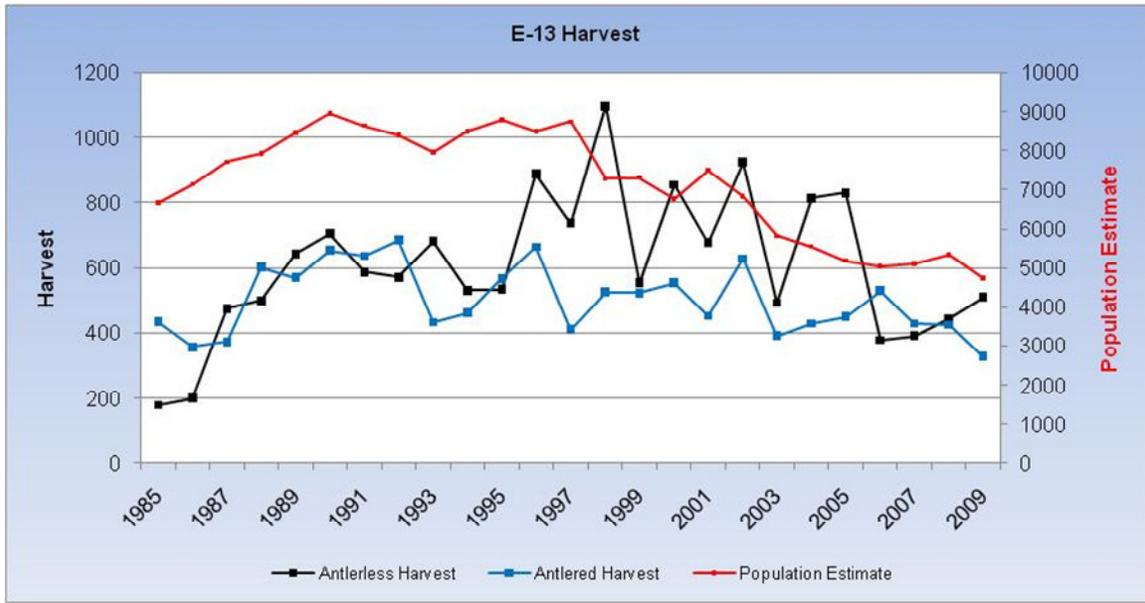


Figure 12. E-13 Harvest.

### Hunting Pressure

Hunting pressure in the Williams Fork DAU has increased along with the elk population. The lowest number of elk hunters was 404 in 1956 and the highest was 11,975 in 1997. Archery hunter participation has increased steadily from a low in 1986 of 389 to a high in 2008 of 1437 (Figure 13). Muzzleloader participation had been a low in 134 in 1991 to a high in 2002 of 679. Rifle hunter participation has been a low in 1986 of 3719 to a high in 1998 of 9025. During the period 1991-1999 total hunter numbers averaged 8,589 and from 2000-2009 hunter numbers have averaged 8,744.

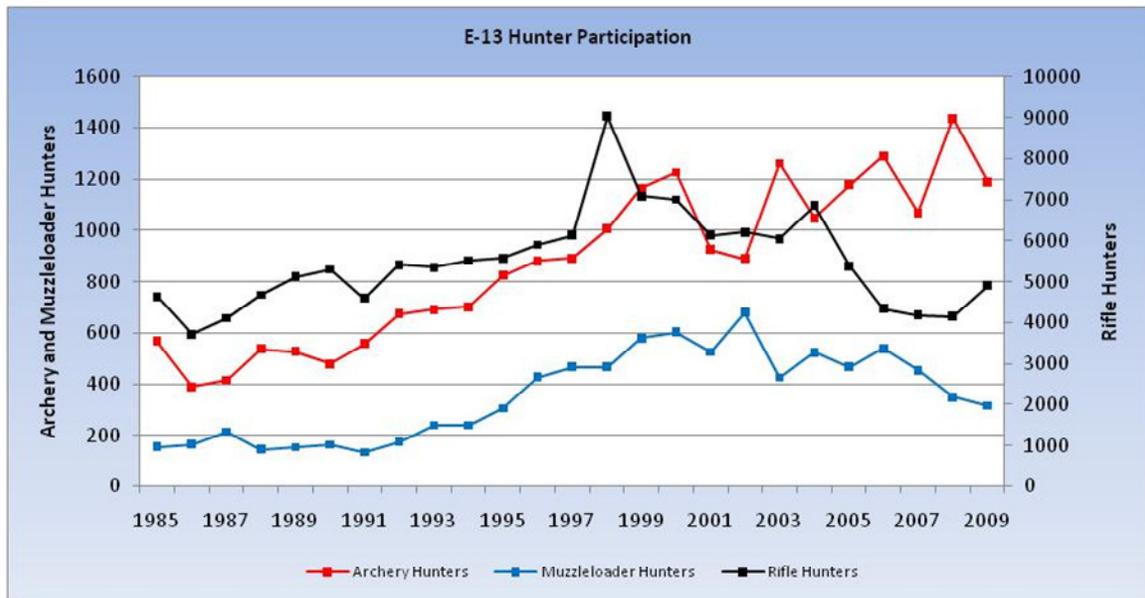


Figure 13. E-13 Hunter Participation.

Overall hunter success has declined somewhat over the years (Figure 14). During the 1950's, percent success averaged 22%; it dropped to 20% in the 1960s, and then dropped further to 16% in the 1970s, and 17% in the 1980s. During the period of 1991-1999, overall hunter success averaged 17%. From 2000-2009, overall hunter success averaged 16%. The past 3-year average is 13%.

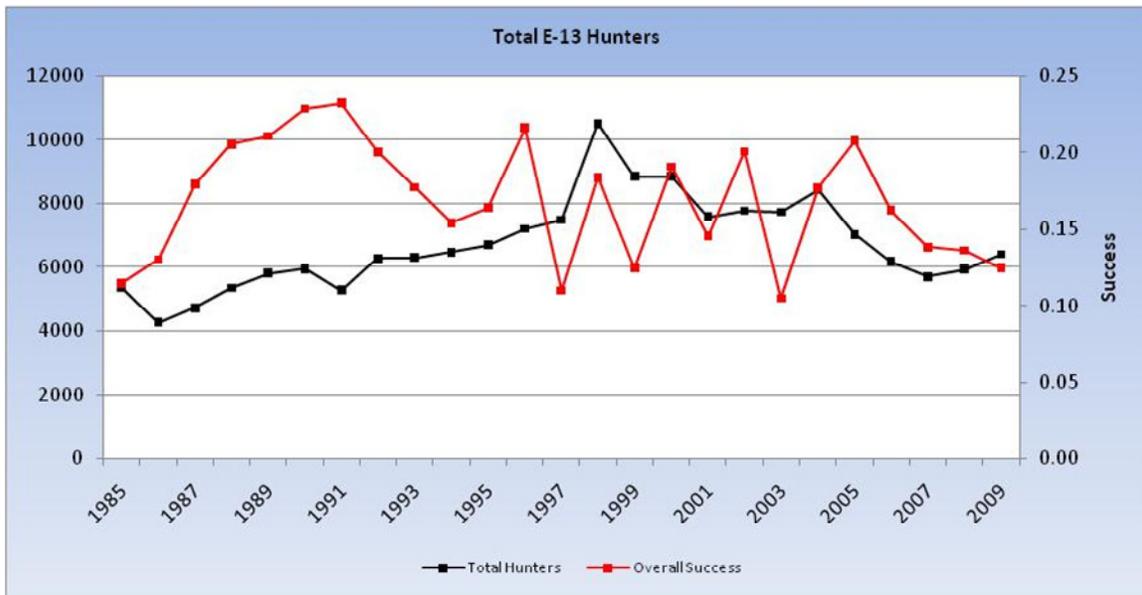


Figure 14. E-13 Success.

### Season Structure

Hunters have been able to buy a general license to hunt bulls in DAU E-13 since at least 1947 (unlimited either sex seasons were held from 1948-51). Starting in 1953, limited antlerless licenses have been available by drawing.

An elk season separate from deer was initiated in 1971, and Colorado went to two separate and one combined seasons in 1976. Another major overhaul of the season structure occurred in 1986 when the three combined season structure made its appearance.

Antler point restrictions have been used at times to improve the number of bulls 2½ years and older in the population. An antler point restriction (4 point) has been in effect in E-13 since 1986.

Besides either-sex licenses, CDOW has tried various methods of increasing cow harvest in Middle Park. In 1985, the first late cow hunt was tried in GMU 371. In 1990 and 1991 late private land only (PLO) seasons were held. These proved unpopular with landowners and there were problems with hunters pushing elk off public lands, so these hunts were discontinued. The CDOW started issuing limited antlerless licenses in the 1<sup>st</sup> Combined Season beginning in 1992. A nine-day late season was held three weeks after the close of the 3<sup>rd</sup> season in 1997, with 1,000

antlerless licenses for all of Middle Park north of I-70. Licenses for this late season were sold first come first served and demand for these far outstripped availability; hunters succeeded in harvesting about 350 cows in Middle Park, but the season was not without its problems (agents and offices were swamped, and there were safety concerns, poor sportsmanship and illegal bull harvest). To alleviate these problems the late season was converted to a limited antlerless elk late season, with limited licenses numbering between 310 and 430 from 2007 – 2010.

PLO antlerless licenses were again instituted in 1996 and PLO either sex licenses were offered beginning in 2000. Both these licenses continue to be offered through 2010.

Beginning in 1999 all antlerless licenses in E-13 are considered additional and this continues through 2010. Beginning in 2000, bull licenses were limited in the first rifle season. Beginning in 2005, the first and fourth rifle seasons were limited with eithersex licenses. This continues through 2010.

## **CURRENT HERD MANAGEMENT**

Prior to 1979, CDOW's intent was to increase elk in DAU E-13. Following the severe winter of 1978-79 the objective was to stabilize the population. In 1988 and '89, the objective was to have more elk in the population (4,200 elk and 3,800 elk respectively).

The first DAU planning process was completed in 1990 which resulted in the lower objective of 3,000 elk in the post-season population, along with a sex ratio objective of 24 bulls:100 cows. In 1999 a second DAU planning process was completed for E-13 resulting in maintaining the population objective at 3,000 elk with a sex ratio objective of 24 bulls:100 cows.

## **CURRENT MANAGEMENT PROBLEMS/CONSTRAINTS**

### **Limited Winter Range**

Only a limited amount of habitat is available in Middle Park to support deer, elk, and pronghorn during the winter. Habitat continues to be converted to housing and associated development and there may not be enough traditional winter range remaining in the southern part of the E-13 to sustain present elk numbers during the severest of winters. Wintering herds also have to contend with an increasing number of recreational users. When recreation occurs on winter range, animals often seek refuge on private lands, aggravating existing conflicts. The larger elk herds of the last two decades have also encroached on winter range needed by deer. Elk also continue to utilize the lodgepole pine forest impacted by the MPB. This has increased elk use on the forest during average winters, fall, and spring.

### **Competition with Deer**

While deer numbers were in general decline over the past 15-20 years in Middle Park, elk numbers were building. During this period of increase, elk have expanded their historic winter ranges into lower elevations, potentially competing with deer for space and forage. Elk are

stronger and more aggressive than deer, and have more diverse food habits. Deer may also be impacted at other times of the year on transition ranges.

### **Refuge Areas and Changes in Land Use**

Many of the traditional ranches around Fraser, Granby and Silverthorne have been subdivided. As patchwork ownership develops, it becomes increasingly difficult to provide recreational hunting opportunities and to obtain appropriate harvest. In those situations where a family continues to control a large area, owners are tending to become very conservative in the amount of hunting they allow. Conflicts with public land hunters and small parcel landowners occur with some regularity. Hunters become upset about the lack of animals on public lands and complain that large parcel landowners are holding elk on private lands for their own paying hunters. On the other hand, large numbers of hunters on public land often create a formidable barrier, unwittingly pushing elk back onto private lands as soon as animals try to cross over onto public ground. Large private parcels around Granby and Tabernash, YMCA (Snow Mountain Ranch), Young Life, and Granby Ranch are refuge areas for elk that are not hunted in addition to limiting hunter access to National Forest and BLM. These areas regularly hold 500+ animals during periods of the hunting seasons. The molybdenum mill of Cyprus Amax falls under the Mine Safety Act and firearms are not allowed on its industrial area (tailings ponds and mill site); this area provides refuge for several hundred animals during the hunting season.

### **Changes in Recreational Use**

Mountain bikes, all-terrain vehicles, snowmobiles and sport utility vehicles have all come into existence within the last 20-30 years. Recent technological advances have made these more efficient, with increased comfort and reliability. Bikes and ATVs allow humans to visit areas that were once the domain of the dedicated hiker or those on horseback. Extensive road and trail networks have been developed since these inventions came onto the scene. During winter flights conducted by CDOW in helicopter and fixed-wing plane in Middle Park, snowmobile tracks are observed throughout many parts of the winter range. Changes in demographics and culture have increased the portion of the urban residents that recreate in these areas. The resident population residing in Grand and Summit County has also increased. Residents regularly go biking, driving, hiking or jogging before or after work. Ownership of large dogs has increased over the years and people frequently bring their pets with them to the mountains. All of this adds up to a tremendous increase in the presence of humans and pets in important parts of elk habitat. Elk are displaced with this disturbance to areas of fewer disturbances (often large private land parcels). Such displacement could be increasing use on transitional ranges which deer and elk typically occupy during the spring and early winter. These areas are important to animals needing to build fat reserves for the winter, and rebounding from the rigors of winter in preparation for lactation.

### **Habitat Changes due to the Mountain Pine Beetle**

Since 1998, the MPB infestations and resulting lodgepole pine mortality have greatly altered the vegetation type in Middle Park and E-13. The response of the vegetation understory after the mature trees die is dramatic and widespread. Forage has increased significantly. Carrying capacity will increase until new trees shade out the ground vegetation, also altering distribution of big game. Deer and elk tend to be dispersed more widely through the lodgepole pine

vegetation type and can be difficult to harvest. In addition, deer and elk are utilizing the lodgepole pine vegetation type later into the fall and winter. This reduces game damage conflicts. These changes create challenges for wildlife managers in maintaining current harvest objectives for big game in E-13. As timber falls, hunter access will become difficult, while at the same time sheltering deer and elk. Potential large wildfires could occur, further altering big game use and distribution.

### **Low Hunter Success**

Hunter success has tended to be low in this DAU since the early seventies and it has become increasingly difficult to harvest enough cow elk in recent years. Over the past five years harvest success has averaged 15%. There appears to be a diminishing return when increasing the number of cow licenses issued – more hunters result in lower success with no increase, or only slight increases, in harvest. This problem appears to be a result of limited access, both physical and legal, to key elk hunting areas in the DAU. It is also related to hunter crowding and the fact that there is a limited pool of dedicated elk hunters on which to draw.

### **Extended Hunting Seasons**

Distribution management hunts can begin in mid-August and extend until the end of January (except during the regular hunting season). Game damage hunts can occur as late as February. Sometimes the harassment that accompanies late seasons intensifies conflicts with livestock operations by exacerbating the movement of elk onto other private properties.

### **Hunter Overcrowding**

There are several areas in the DAU where hunters tend to over-concentrate. These are areas with extensive road networks accessible to ATVs. This problem is also affected to some extent by the number of antlerless permits issued. When hunters dispersed from their vehicles and campsites their activities and density turn back animals trying to move through the area. These situations are counterproductive to achieving harvest goals. The quality of the hunt is obviously affected, and hunters of better ability typically avoid such areas.

### **Chronic Wasting Disease**

Chronic wasting disease (CWD), a naturally-occurring prion disease of North American cervids (species of the “deer” family), is an important wildlife health issue. CWD has been endemic in free-ranging cervid populations in north central Colorado and Southeastern Wyoming since at least the early 1980s, and has been detected in a number of other states and provinces. Surveys continue to show that CWD is relatively well-established and widely distributed in Colorado including E-13. Surveys in E-13 began in 2001 and the first positive detection of CWD in E-13 was in 2002. Since then, 3 elk in E-13 have tested positive for CWD. Between the years 2006-2008, 343 samples were submitted with 1 positive sample and a .3% prevalence rate.

## ALTERNATIVE DEVELOPMENT

### Population Estimation and Population Objective Setting

#### 1999 DAU Plan objectives

Population = 3,000

#### Post-season 2009 estimates

Population = 4,700

Since 1999 attempting to reduce this herd to population objective of 3,000 elk has resulted in reduced hunter success and satisfaction. Significant reductions in game damage and private land conflicts have been achieved and the changes to the lodgepole forest community (from the mountain pine beetle) have increased the habitat for elk.

In 1999, when the last population objective was set, CDOW underestimated the size of the elk population in Middle Park. At the time, it was felt that reducing the population by 40% would bring the population in DAU E-13 down to the objective of 3,000 animals. During the last decade, as indicated above, extensive measures were implemented to reduce the elk population. In that period over 12,000 elk were harvested. The 2009 post hunt population estimate of 4700 elk would require an additional 36 % reduction to achieve the current population objective of 3000 elk. Therefore the following alternatives were developed to illustrate the potential population ranges of elk the E-13 DAU plan could manage for in the next decade.

Alternative 1 – 3,000 to 3,600 elk post season (decrease of 36% from current population objective)

Alternative 2 – 4,100 to 4,900 elk post season (lower range of current population estimate)

**Preferred Alternative 3** – 4,700 to 5,500 elk post season (upper range of current population estimate)

Alternative 4 – 5,100 to 6,000 elk post season (increase of 9% from current population estimate)

Alternative 1 reduces the current number of elk by 36%. This level would require a higher harvest on antlerless animals and would reduce legal bull opportunity. The lower range of this alternative is what the population objective has been set at since 1990. Short term, this would significantly increase hunter crowding to approach this population objective.

Alternative 2 is the lower range of where the current population level is at. This population level would continue to provide opportunity for antlerless and bull elk hunters. This level continues to work towards an increased harvest and reduce overall numbers of elk. This alternative provides a balance of hunter opportunity while minimizing potential for landowner conflicts.

**Alternative 3 (preferred alternative)** is the upper range of where the current population level is at. This range encompasses where the population has been since 2004. This population level would provide opportunity for antlerless and bull elk hunters. This level continues to maintain

harvest and maintain overall numbers of elk. This alternative provides a balance of hunter satisfaction and opportunity while minimizing potential for landowner conflicts.

Alternative 4 is an increase of the current population by 9% from the 5-year average (2004-2009 post hunt). The lodgepole forest component of the habitat (as a result of mountain pine beetle) has resulted in a significant change in use by elk. The habitat can sustain this increase in elk populations and will provide the maximum benefit for bull elk hunters. This higher population level may lead to more landowner conflicts primarily during more severe winters and on refuge situations where little or no elk hunting is allowed. The population has been within this range most recently from 2003-2008.

### **Expected Sex Ratio Range (Bulls:100 Cows)**

The term “sex ratio objective” has been replaced by the more appropriate term “sex ratio (bulls:100\_cows) range” and is presently at 21-31 bulls:100 cows. The current bull harvest regime in E-13 is limited licenses for 1<sup>st</sup> rifle season, 4<sup>th</sup> rifle season, and muzzleloader season, OTC eithersex licenses in archery, and OTC bull in 2<sup>nd</sup> and 3<sup>rd</sup> rifle seasons. This existing bull harvest framework has resulted in observed post-season bull ratios, between 21-31 bulls:100 cows 56% of the time since 1991 (Table 3 and Figure 15). Six percent (6%) of the observed bull ratios since 1991 have been below this management range. The 5-year average bull ratio of 33.6 is above this range. The overall average since 1991 (28.7 bulls:100\_cows) and the 10-year average (31.4 bulls:100cows) are within this range.

Since 1991, the 3-year average observed bull ratio has been below 21 only once (1991-1995) with a 3-year average of 20.6. Only three of the 3-year averages since 1991 have been above 31. These include 2001-2003 (32.0), 2005-2007 (32.9), and 2007-2009 (32.3).

There is a high degree of variability with observed bull to cow ratios in E-13. For example, they have ranged from 23.6 to 45.7 between 2008 and 2009. E-13 also exhibits higher bull ratios than most OTC DAU's. This can be explained by the migratory habits of elk and their distribution during winter classification relative to DAU boundaries which result in higher, and more variable, bull ratios for E-13. Large herds of cows and calves often migrate out of the DAU from the Blue River drainage to Radium while bulls typically remain at higher elevations and stay in E-13. Another factor supporting the anomalous nature of the high E-13 bull ratios is the fact that bull hunter success rates for E-8 (The elk DAU for the north half of Middle Park) and E-13 are very similar. The 3-year average for all seasons in E-8 is 12% success and for E-13 it's 13%. If pre-hunt bull ratios were truly different in the two DAU's you would expect E-13 to be much more popular with hunters, which it isn't, and have much higher success, which it doesn't. All of which supports the fact that the high bull ratios observed in E-13 are predominately an artifact of the conditions described above rather than a definitive difference attributable to the population as a whole.

Thus for this DAU plan a range of 21-31 bulls:100 cows is the expected herd sex ratio range given continued management with an OTC licensing system, antler point restrictions, and the current 5-year season structure which includes limited licenses in the 1<sup>st</sup> and 4<sup>th</sup> rifle seasons.

The recommended sex ratio range covers the range of bull to cow ratios often observed and maintains the bull harvest season structure and current management regime. This allows for higher bull to cow ratios when conditions allow, but doesn't restrict opportunity if higher harvest occurs because of favorable weather, unless bull to cow ratios fall below a minimum lower management threshold.

Achieving a higher sex ratio (bulls:100 cows) than the preferred range of 21-31 bulls:100 cows would require limiting licenses in archery, 2<sup>nd</sup> and 3<sup>rd</sup> seasons which accounts for 60% of the bull harvest while approximately 39% of bull harvest occurs in 1<sup>st</sup>, 4<sup>th</sup>, and muzzleloader seasons in which license numbers are already limited in the 2010-2014 big game season structure. Maintaining bull ratios above the expected sex ratio, with OTC 2<sup>nd</sup> and 3<sup>rd</sup> seasons, would be unlikely because favorable hunting conditions during 2<sup>nd</sup> and 3<sup>rd</sup> seasons would result in higher harvest and lower post-season bull ratios. The following year the only management options available would be to considerably reduce limited 1<sup>st</sup> and 4<sup>th</sup> rifle season and muzzleloader license quotas to attempt a measurable impact on post-season ratios the next year. The overall reduction in harvest would likely be minimal because hunters that don't draw a limited license could hunt in the OTC bull 2<sup>nd</sup> or 3<sup>rd</sup> rifle seasons.

It is also important to note that cow harvest has exceeded bull harvest in 8 of the last 10 years while attempting to reach the old population objective. A new population objective closer to the existing population size would result in fewer antlerless licenses being issued and thus a reduced cow harvest. Also some cow hunters would elect to hunt bulls if they don't draw cow licenses, both of which could lower observed, post hunt, bull:cow ratios.

Significantly increasing the herd composition (bulls:100cows) range is most achievable with totally limited elk licenses and would require a public nomination process through the Wildlife Commission and is outside the scope of this DAU plan revision. Totally limiting elk hunting to achieve a higher bull ratio is not preferred by most of the public in Middle Park. Comments received during the public information process and survey results, indicate most elk hunters are interested in maintaining hunting opportunity. Additionally, elk distribution and the exceptionally rugged habitat in E-13 should allow a higher bull ratio and still retain over-the-counter licenses.

**Table 3.**

Table shows observed sex ratios for E-13.

<b>E-13 Bull:Cow Ratios</b>		
<b>Year</b>	<b>Observed</b>	<b>SE</b>
<b>1991</b>	18.3	3.56
<b>1992</b>		
<b>1993</b>	20.8	2.34
<b>1994</b>		
<b>1995</b>	22.8	2.06
<b>1996</b>		
<b>1997</b>	24.9	3.17
<b>1998</b>	34.5	5.17
<b>1999</b>	23.8	3.07
<b>2000</b>	27.5	3.45
<b>2001</b>	28.3	4.76
<b>2002</b>	35.0	4.93
<b>2003</b>	32.6	6.79
<b>2004</b>	22.8	4.62
<b>2005</b>	36.9	7.07
<b>2006</b>	34.3	9.67
<b>2007</b>	27.5	4.26
<b>2008</b>	23.6	4.90
<b>2009</b>	45.7	11.34

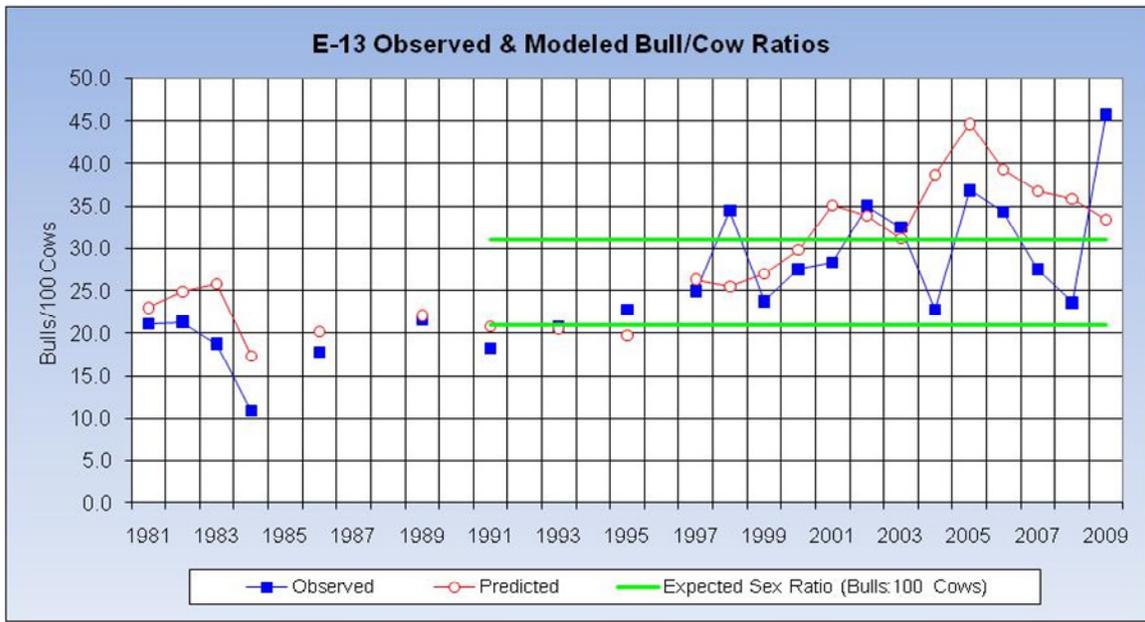


Figure 15. Figure shows E-13 observed bull ratios with herd composition range.

### Management Thresholds

As long as the observed herd composition (bulls:100 cows) stays within the “expected range”, license allocation will not be used to affect bull harvest in the limited 1st rifle, 4th rifle ,or muzzleloader seasons. OTC eithersex licenses in archery and OTC bull licenses in 2nd and 3rd rifle season would be maintained.

If 3-year averages of observed bulls:cow ratios fall below a lower threshold of 24 bulls:100 cows, strategies to reduce bull harvest will be implemented. Specifically, further limiting hunter opportunity in the muzzleloader, 1<sup>st</sup> and 4<sup>th</sup> rifle seasons are available options.

### Public Involvement

Public input for the DAU process was gathered in a variety of methods. The draft DAU was posted on the CDOW website along with a public questionnaire. Public questionnaires were mailed to a random sample of 200 limited license holders for E-13 and nearly 90 questionnaires were mailed to the HPP landowner list within E-13 (see Appendix A). A total of 48 questionnaires were returned to the CDOW.

The CDOW conducted three public meetings with one in Frisco, Kremmling, and Granby each. A total of 30 participants attended the public meetings.

Additionally, notices were sent to land management agencies including the BLM Kremmling Field Office, the Sulpur Ranger District of the Arapaho National Forest, the Dillon Ranger District of the White River National Forest, the Parks Ranger District of the Route National Forest, and Rocky Mountain National Park.

The CDOW provided presentations of the draft DAU plans to the local Middle Park Habitat Partnership Program committee, the Grand County Board of County Commissioners, and the Summit County Board of County Commissioners.

Public survey responses are summarized in Appendix B. Additionally, several letters were received by the CDOW regarding the draft DAU plans (Appendix C). These include the BLM Kremmling Field Office, the Sulphur Ranger District of the Arapaho National Forest, the Dillon Ranger District of the White River National Forest, the Middle Park Habitat Partnership Program, the Middle Park Conservation District, Blue Valley Ranch and Rob Firth.

Overall, approximately 45% of the respondents owned or leased property within the DAU while 69% of the respondents indicated that they had participated in recreational activities in the DAU within the past 12 months. 47% of the respondents were primarily hunters with 22% being conservationists, 13% being interested as landowners, and 13% as ranchers.

Of the respondents, 11% thought that the elk hunting in DAU E-13 was excellent, 24% felt that the elk hunting was fair, 33% felt that the elk hunting was good and 28% felt that the elk hunting was very good. Only 4% of the respondents felt that the elk hunting within DAU E-13 was poor.

Most of the respondents, (58%) would like to see more elk in DAU E-13, 20% preferred the same, and 8% wanted a decrease in herd size.

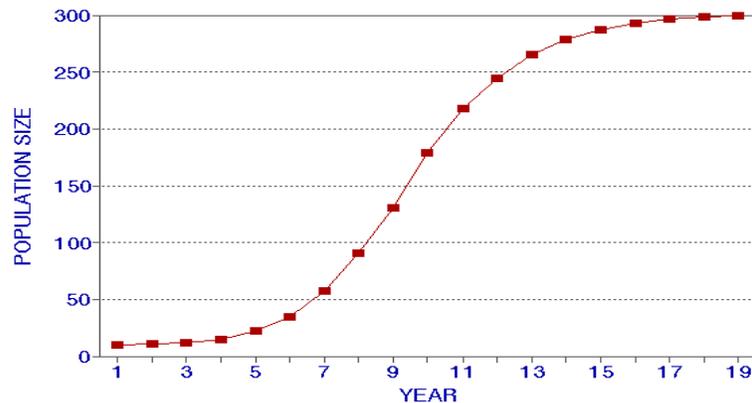
Of the respondents, 64% thought it was very important to harvest an animal for game meat, while 21% did not want to see other hunters and 15% considered harvesting mature animals a priority.

## APPENDIX A Population Dynamics

The sigmoid curve can be used to describe various phenomena in nature, including the typical growth pattern for animal populations. Three phases of this population growth curve are readily apparent:

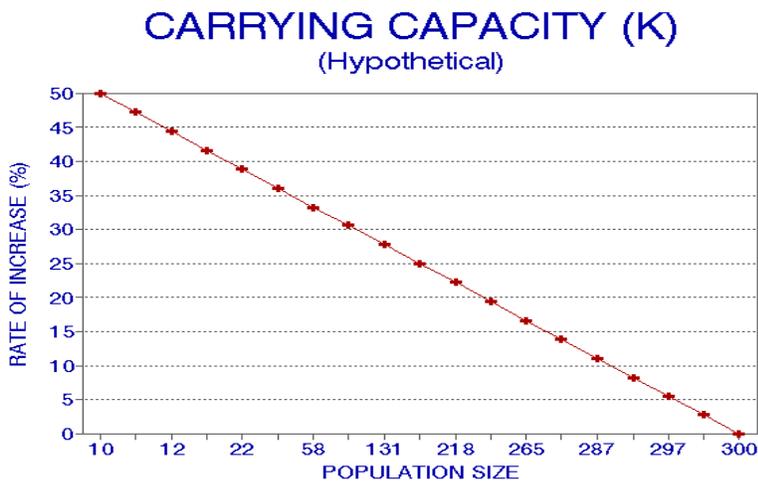
Establishment phase (years 1-5 on the graph): here the population is gaining a foothold; numbers are low, and the population will be significantly affected by mortality and recruitment (recruitment being animals added to the breeding component of the population). In this situation the rate of increase may be high, but due to the small core population, the increase in actual numbers is small (*e.g.*, a 50% increase in ten animals is only five individuals).

**SIGMOID GROWTH CURVE**  
(Hypothetical)



Prosperity Phase (years 6-15 on the graph): food, cover, water and living space are still abundant. Survival rates are at their highest. Although the rate of increase is declining, the population begins to build "momentum" because of the increasing size of the core population; this results in larger

increases in actual numbers (*e.g.*, a 30% increase in a population of 100 animals results in 30 additional animals). Since the population is experiencing its greatest recruitment in this range, the largest surplus would be available for hunting (see the concept of MSY on the following page). The situation at this point tends to be ideal from several management aspects – range condition and trend are optimal, economic return to state wildlife agencies



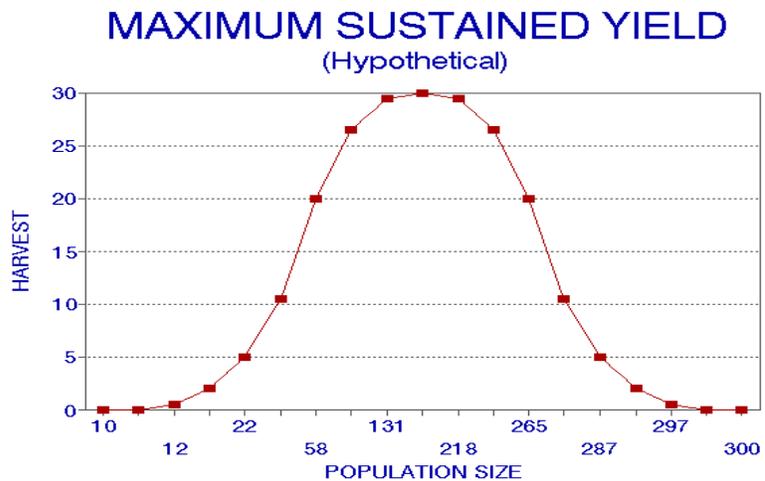
is the greatest, while game damage problems are still minimal. These circumstances represent a win-win situation for both sportsmen and landowners.

Equilibrium Phase (Years 16-19 on the graph): the population continues to grow until it reaches the maximum carrying capacity of the habitat (the K value). Animals become crowded into available habitat, bringing them into direct competition with each other. Environmental resistance develops due to the scarcity of some resources. Game damage problems tend to be the worst under these circumstances. Momentum developed in the prosperity phase begins to dissipate as the rate of increase approaches zero. Overall condition of animals declines and mortality is high, especially among young and those under stress. Only the fittest animals breed successfully. Animals recruited into the population will equal those dying. If condition of the habitat deteriorates further, then deaths begin to exceed recruitment.

The straight-line regression graph shown above illustrates how growth rates vary at different population levels.

Maximum sustained yield (MSY) theoretically occurs at half the population that would be present at maximum carrying capacity. At this point, the greatest harvest of animals can be sustained over the long term, providing animals are removed randomly (without regard to age or sex). Hunting doesn't normally occur in this manner; however, the concept can still be viewed as a general guideline for purposes of discussion. In the MSY curve

shown at the right, it is noteworthy that at points equidistant above and below MSY the same surplus of animals will likely be available in any given population. Maintaining a population at a point to the left of MSY is an exacting business, however. Population size must be accurately measured, along with recruitment and mortality. Any over-harvest or under-harvest will require dramatic adjustments in future harvests, creating a boom-or-bust management scenario. On the other hand, managing at a point to the right of MSY tends to be very forgiving, since population dynamics naturally compensate for any management "mistakes."



**APPENDIX B  
Public Questionnaire**

**OPPORTUNITY FOR PUBLIC COMMENT**



**ELK MANAGEMENT**

In the Middle Park Area  
COLORADO

Data Analysis Unit E-13  
(Game Management Units 28, 37 and 371)

*The Colorado Division of Wildlife is interested in your opinions about elk management in the Middle Park Area. The results of this effort will help wildlife managers prepare deer management plans for this area. This questionnaire is your opportunity to provide input on the management of elk in Game Management Units 28, 37, and 371.*

*Colorado Division of Wildlife  
Hot Sulphur Springs Service Center  
P.O. Box 216  
Hot Sulphur Springs, CO 80451*

June 2010

Dear Interested Citizen:

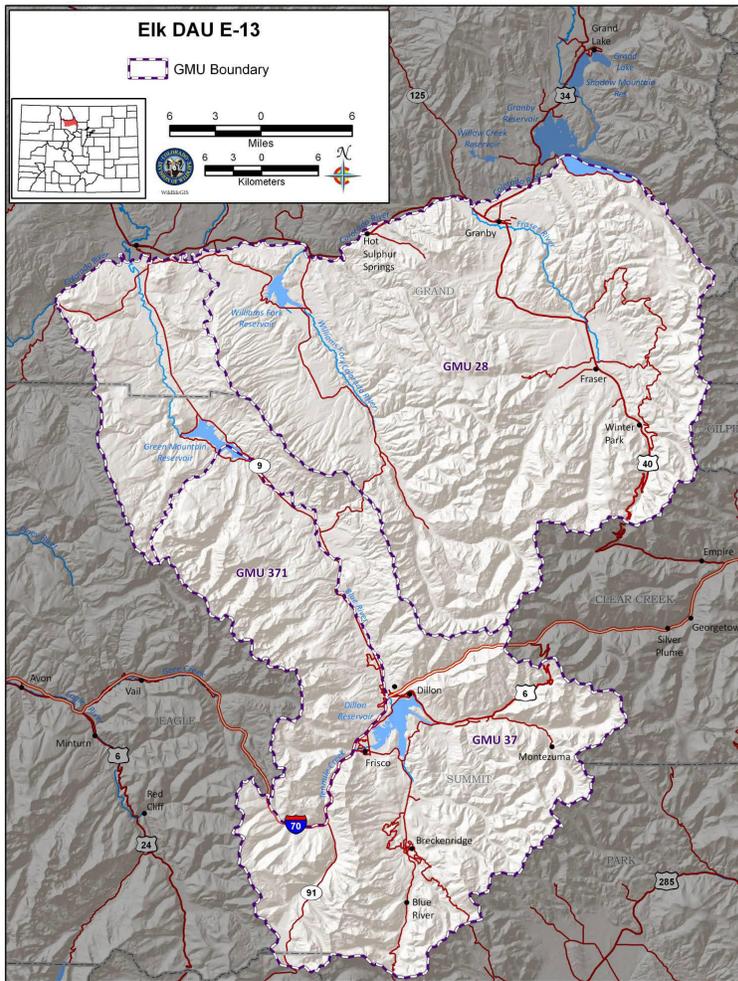
The Colorado Division of Wildlife (CDOW) is interested in your opinions about elk in the Middle Park Area, including Game Management Units (GMU) 28, 37 and 371. Wildlife managers have begun the process of updating the elk management plan for this area, which will affect future harvest strategies and license setting.

In Colorado, big game populations are managed for a specific geographic area, which we call a Data Analysis Unit (DAU). A DAU generally includes several GMU's. In this case, the Middle Park DAU includes GMU's 28, 37 and 371. The purpose of the DAU plan is to determine: 1) how many elk the DAU should support, and 2) what sex ratio (number of bulls per 100 cows) the herd be managed for.

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

Your input is an important part of the DAU planning process. The information you provide will help develop CDOW's recommendation for elk herd objectives (population size and sex ratio) in the Middle Park area. Our recommendation will then be incorporated into the DAU plan, which will be reviewed, and ultimately approved, by the Colorado Wildlife Commission. Please be assured that your responses will remain confidential. **Surveys must be returned to the CDOW Hot Sulphur Springs Service Center by July 16, 2010.** For a copy of the entire draft E-8 DAU plan go to the Colorado Division of Wildlife at <http://wildlife.state.co.us/Hunting/BigGame/HerdManagementDAUPlans/>.

First, please examine the map and written description of the areas designated as Data Analysis Unit E-13, Game Management Units 28, 37, and 371, located in North Central Colorado, then go to Question 1.



**Description of DAU E-13:** The Williams Fork Elk DAU (E-13) is located in north-central Colorado and consists of GMUs 28, 37 and 371. It is bounded on the north by the Colorado River, Lake Granby and Arapaho Creek, on the east and south by the Continental Divide, and on the west by the Gore Range and Eagles Nest Wilderness Divide. This DAU takes in the southern half of Middle Park, and includes all of Summit County and about half of Grand County.

**BACKGROUND INFORMATION**

- 1) Are you a resident of Colorado?  
 Yes  
 No
  
- 2) Do you live in GMU's 28, 37, or 371?  
 Yes If yes, how many years and in what GMU?  
 No
  
- 3) Do you own or lease property in GMU's 28, 37, or 371?  
 Yes If yes, how many years and in what GMU? \_\_\_\_\_ Years \_\_\_\_\_ GMU  
 No



- D) Predation on the elk population by coyotes,  
bears and mountain lions..... 1 2 3 4 5
- E) Loss of elk habitat due to increased human  
population & development..... 1 2 3 4 5
- F) Potential starvation of elk during the winter.....1 2 3 4 5
- G) Elk spreading disease to pets, livestock, or  
humans.....1 2 3 4 5
- H) Elk competing with livestock for forage.....1 2 3 4 5
- I) Potential competition between elk and deer for  
habitat.....1 2 3 4 5
- J) Revenue that elk hunting provides local business. ....1 2 3 4 5

3) Have you been personally affected by any of the concerns listed in Question 2 in GMU's 28, 37, or 371?

- Yes            If yes, circle one: A B C D E F G H I or  
J  
 No

4) How do you personally feel about elk in GMU's 28, 37, or 371? (*Check ONE*)

- I do not enjoy the presence of elk in GMU's 28, 37, or 371, AND regard them as a nuisance.
- I enjoy the presence of elk in GMU's 28, 37, or 371, BUT worry about the problems they may cause.
- I enjoy the presence of elk in GMU's 28, 37, or 371 AND do not worry about the problems they may cause.
- I have no particular feelings about elk in GMU's 28, 37, or 371.

**ELK MANAGEMENT**

1) How would you like the elk population in GMU's 28, 37, or 371 to change, if at all?

- Decrease (30-40%)
- No Change
- Increase (10%)
- Don't know

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

- Not                      Slightly                      Very    Don't  
Important            Important            Important            Important            Know

If you indicated that you would like a decrease in the elk population (in Question #1 above), what methods would you support or oppose to decrease elk numbers? (Circle one number for each item)

	Strongly <u>Oppose</u>	Oppose	Opinion	Support	Strongly Support
Either sex licenses.....	1	2	3	4	5
Additional cow tags.....	1	2	3	4	5
Increase cow licenses.....	1	2	3	4	5

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

	Strongly <u>Oppose</u>	Oppose	Opinion	Support	Strongly Support
Reduce cow licenses.....	1	2	3	4	5
Reduce eithersex licenses.....	1	2	3	4	5

**ELK HUNTING**

1) Have you ever hunted elk in Colorado?

- Yes      If yes, how many years?  
 No

2) Have you ever hunted elk in GMU's 28, 37, or 371?

- Yes  
 No

3) Overall, how satisfied have you been with your elk hunting experience(s) in GMU's 28, 37, or 371 in the last 5 years? (Circle ONE)

Very Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Very Satisfied
1	2	3	4	5

4) Overall, to what extent have you felt crowded by other hunters while elk hunting in GMU's 28, 37, or 371? (Circle ONE)

Extremely      Moderately      Slightly      Not at all

Crowded      Crowded      Crowded      Crowded  
1              2              3              4

5) Rank the following items from 1 to 5 in the order that they would most likely improve your elk hunting experience in GMU's 28, 37, or 371. (1=most likely to improve, 5=least likely to improve) Do not use any number more than once.

- Less hunter crowding
- Higher hunter success rate
- Less motorized vehicle access
- Seeing more mature bulls
- Seeing more elk

6) Overall, how would you rate the quality of elk hunting opportunities available in GMU's 28, 37, or 371? (*Circle ONE*)

Poor      Fair      Good      Very Good      Excellent      No Opinion

7) Which ONE factor is the MOST important to you when elk hunting in GMU's 28, 37, or 371? (*Check ONE*)

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

**WRITTEN COMMENTS:**

Please use the space below for any additional comments you would like to make about elk in GMU's 28, 37, or 371.

---

---

---

---

---

---

---

---

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

*Surveys must be returned to the CDOW Hot Sulphur Springs Service Center by  
July 16, 2010.*

**TO RETURN THIS QUESTIONNAIRE:**

**Please drop it in the mail to:**

**Colorado Division of Wildlife**

**P.O. Box 216**

**Hot Sulphur Springs, CO 80451,**

**or deliver in person to the**

**Colorado Division of Wildlife**

**346 County Road 362**

**Hot Sulphur Springs, Colorado 80451**

**APPENDIX C**  
**DAU E-13 Public Questionnaire Results**  
(Sample Size 49)

**Background Information**

- 1) 96% Resident and 4% Non-Resident
- 2) 50% did live in DAU E-13 and 50% did not live in DAU E-13
- 3) 45% did own or lease property within DAU E-13 and 55% did not
- 4) 69% did recreate in DAU E-13 within the past 12 months and 31% did not
- 5) Which group represents interest in elk management within the DAU
  - a. 13% Rancher
  - b. 4% Business Owner
  - c. 13% Landowner
  - d. 0% Guide/Outfitter
  - e. 47% Hunter/Sportsman
  - f. 22% Environmental/Conservation
- 6) Of those that indicated multiple groups the one that best represents are:
  - a. 16% Rancher
  - b. 0% Business Owner
  - c. 8% Landowner
  - d. 0% Guide/Outfitter
  - e. 72% Hunter/Sportsman
  - f. 4% Environmental/Conservation

**People and Elk**

- 1) Out of 5 being the most interested, how interested were individual interested in the following:
  - a. Watching/Photographing elk 4.0
  - b. Hunting elk 4.8
  - c. Seeing elk 4.6
  - d. Learning about elk management 3.9
  - e. Providing input for elk decisions 4.2
- 2) Out of 5 being very concerned, how concerns were individuals of the following:
  - a. Elk/Vehicle collisions 3.2
  - b. Economic losses to ranchers 3.4
  - c. Damage to homeowners property 2.6
  - d. Predation on elk 3.3
  - e. Loss of elk habitat due to human development 4.4
  - f. Potential starvation during winter 4.4
  - g. Elk spreading disease 3.3
  - h. Elk competing with livestock 3.7
  - i. Potential competition between elk and deer 3.5
  - j. Revenue that elk hunting provides to local businesses 4.0
- 3) 58% of respondents indicated that they had been affected by concerns in Question 2.

- a. Elk/Vehicle Collisions 4%
  - b. Economic losses to ranchers 18%
  - c. Damage to homeowners property 6%
  - d. Predation 2%
  - e. Loss of habitat due to human development 33%
  - f. Potential starvation 6%
  - g. Spreading disease 8%
  - h. Elk competing with livestock 16%
  - i. Competition between elk and deer 4%
  - j. Revenue to local businesses 2%
- 4) How did respondents personally feel about elk within DAU
- a. 0% regarded them as a nuisance
  - b. 30% enjoyed having elk but worry about the problems they may cause
  - c. 70% enjoyed having elk and did not worry about the problems they may cause
  - d. 0% had no opinion about elk

### **Elk Management**

- 1) How did respondents want the elk population to change
  - a. 8% would like the population to decrease
  - b. 20% would like to see no change
  - c. 58% would like to see an increase
  - d. 14% didn't know
- 2) How important is the change of the elk population
  - a. 2% felt that is was not important
  - b. 15% felt it was slightly important
  - c. 38% felt it was important
  - d. 46% felt it was very important
  - e. 6% did not know
- 3) Of those that indicated they would like a decrease in elk population, 100% would strongly support either sex licenses, 100% supported additional cow licenses, and 100% supported increasing cow licenses.
- 4) Of those that indicated they would like an increase in elk population, 32% opposed reducing cow licenses while 50% supported reducing cow licenses. 38% opposed reducing either sex licenses while 46% supported reducing either sex licenses.

### **Elk Hunting**

- 1) 100% of respondents indicated that they have hunted in Colorado
- 2) 94% of respondents indicated that they had hunted within the DAU while 6% indicated that they had not hunted within the DAU
- 3) 28% of the respondents indicated that they were dissatisfied with the elk hunting within the DAU while 51% indicated that they were satisfied with the hunting within the DAU.
- 4) 11% of the respondents felt that the DAU was extremely crowded by other hunters, 34% indicated that the DAU was slightly crowded by other hunters, 23% indicated that the DAU was slightly crowded by other hunters, and 32% felt that the DAU was not at all

- crowded by other hunters.
- 5) Less motorized vehicle access was the number one item that would improve the hunting experience followed by seeing more elk, then higher success rates followed by seeing more mature bulls. Less hunter crowding was the least likely factor to improve the hunting experience.
  - 6) Overall, 4% felt that the elk hunting opportunity was poor. 24% felt that the elk hunting opportunity was fair and 33% felt that the elk hunting opportunity was good. 28% felt that the elk hunting was very good. 11% of the respondents indicated that the elk hunting opportunity was excellent.
  - 7) 21% of the respondents felt that the most important factor in elk hunting within the DAU is not seeing other hunters. 64% indicated that obtaining game meat and 15% indicated that harvesting a trophy were the most important factors in elk hunting within the DAU.

|

**APPENDIX D**  
**Land Management Agency and Stakeholders Comments**

All

June 15, 2010

Colorado Division of Wildlife  
PO Box 216  
Hot Sulphur Springs, CO 80451

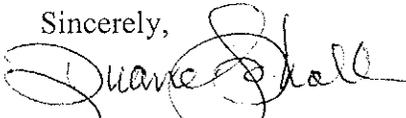
Dear Kirk:

Kirk Oldham, Colorado Division of Wildlife, made a presentation at the Middle Park HPP committee's June meeting on the elk population objectives for DAUs E-8 and E-13. The Middle Park HPP committee was asked to send a letter of recommendation for elk population objectives and sex-ratio objectives to be included in the Appendices of the finalized DAU plan. The committee would like to recommend the following:

- E-8 - 3600-4300 for the elk population objective
- E-13 - 4700-5500 for the elk population objective and
- 21-26 for the bull to cow ratio.

The committee understands that these figures are based on winter capacity levels. If you have any questions, please feel free to contact me at 970-725-3471.

Sincerely,



Duane Scholl, Chairman  
Middle Park HPP



United States  
Department of  
Agriculture

Forest  
Service

Sulphur  
Ranger District

9 Ten Mile Drive  
P.O. Box 10  
Granby, CO 80446  
Voice: (970) 887-4100 TDD: (970) 887-4101  
Web: [www.fs.fed.us/r2/arnf](http://www.fs.fed.us/r2/arnf)  
Fax: (970) 887-4102

---

File Code: 2640 E8/E13 Comments

Date: July 12, 2010

Kirk Oldham  
Terrestrial Biologist  
Colorado Division of Wildlife  
PO Box 216  
Hot Sulphur Springs, CO 80451

Dear Kirk:

Thanks for the opportunity to comment on the Draft DAU Plans for E-8 and E-13, including parts of the Sulphur Ranger District.

I support Alternative 2 for E-8 (Troublesome elk herd) and Alternative 3 for E-13 (Williams Fork elk herd) and the preferred alternatives for sex ratios for both DAUs.

Maintaining current elk population levels appears biologically sustainable and socially practical. Reducing current herd sizes does not appear to be possible as herds have remained relatively consistent since 1999 despite reduction attempts and increasing licenses sold can often lead to even lower hunter success.

Assuming available winter range is still the limiting factor of biological carrying capacity in Middle Park, the temptation to increase herd size in response to the flush of herbaceous vegetation currently available within dead stands of lodgepole pine leaves winter ranges vulnerable to over use. A return to average or severe winters could also leave larger elk herds susceptible to increased conflicts on private lands, increased elk-vehicle collisions along highways and railroads and overall decreased winter survival.

Please contact me or Doreen Sumerlin, Wildlife Biologist, at 887-4124 or 887-4129, respectively, if you have any questions or concerns.

Sincerely,



CRAIG A. MAGWIRE  
District Ranger





## BOARD OF COMMISSIONERS

JAMES L. NEWBERRY  
District I, Winter Park 80482  
NANCY STUART  
District II, Granby 80446  
GARY BUMGARNER  
District III, Kremmling, 80459

E-Mail: grndcty1@co.grand.co.us  
PHONE: 970/725-3347  
Fax: 970/725-0565  
LURLINE UNDERBRINK CURRAN  
County Manager  
ANTHONY J. DICOLA  
County Attorney

July 13, 2010

Lyle Sidener  
Area Wildlife Manager  
D.O.W.  
P.O. Box 216  
Hot Sulphur Springs, CO 80451-0216

Re: Elk Herd Management Plan

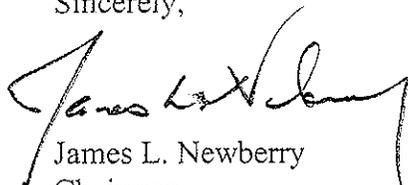
Dear Lyle:

Thank you for the presentation that you and Kirk gave to us on Tuesday. It was extremely informative and helpful. After your presentation, we discussed the three alternatives presented. Grand County supports Alternative #2 which is maintaining the current population level. As you well know, big game hunting is a major economic driver for the county, and the use of the public lands during the hunts is also important to the county.

Enclosed please find the survey that we filled out. As you will see by the written comments, this survey was done by the commissioners as a board, and reflects the board's opinions as a whole.

Again, thank you for your presentation and your time.

Sincerely,

  
James L. Newberry  
Chairman

  
Nancy Stuart  
Commissioner

  
Gary Bumgarner  
Commissioner

JLN:ke

cc: Kirk Oldham



United States  
Department of  
Agriculture

Forest  
Service

White River  
National Forest

Dillon Ranger District  
P.O. Box 620  
680 Blue River Parkway  
Silverthorne, CO 80498  
(970)468-5400  
FAX (970)468-7735

---

File Code: 1500/5330-6/2600

Date: July 14, 2010

Colorado Division of Wildlife  
Hot Sulphur Springs Service Center  
P.O. Box 216  
Sulphur Springs, CO 80451

To whom it may concern:

Thank you for this opportunity to comment on the Draft E-13 (Williams Fork Elk) Data Analysis Unit Plan.

To provide context for our comments, I would first like to update you on Dillon Ranger District projects that could impact the decisions you make on the Plan.

The Dillon Ranger District (District) has begun implementing projects in response to the Mountain Pine Beetle attack on lodgepole pine. The projects are primarily designed to perform vegetation treatments around infrastructure in the county to protect homes and private property, but some portions of the projects are also intended to harvest dead lodgepole pine in the areas considered suitable timber lands base.

Since 2006, the District has started implementing the **Dillon Reservoir Project** which is currently being actively logged. The project targets areas of mature/dead lodgepole pine with a requirement to reserve all conifer species less than 5 inch dbh and all spruce and fir that occur in small groups or as understory to the lodgepole pine. These project timber units are in Ryan and Salt Lick Gulches, Frisco Peninsula, Keystone Ranch, Soda Creek, and Frey Gulch. County or Forest Service roads are the main access with temporary roads as needed within the units. The temporary roads will be used for logging and then when logging has concluded the roads will be closed along with some other primitive roads in the areas of the units that do not access units. The project also includes treatment of 400 foot wide strips along the boundary between Forest Service and private property in Summit Cove and Keystone areas.

Another effort underway is the **North Summit WUI** project that we are starting to implement this summer. This project includes a 400 to 600 foot wide treatment along the boundary between Forest Service and private land to form a Community Protection Zone. This project is located from Wilderrest north to Sierra Bosque with small units around Hamilton Creek and Pioneer Ranch and Ute Pass. This treatment is a fuels project that will affect only lodgepole pine stands.

A project for which the decision was recently made and is currently being laid out is the **Lower Blue Forest Health Project**. This project targets dead stands of lodgepole pine primarily in the Not Rock/Harigan Creek/Slate Creek area, Brush Creek/Doig Gulch area, and Spring Creek



Area. The project has a requirement to leave advance regeneration and protect other species of conifer that occur in the units. When the timber crews lay out the cut units they leave out inclusions of spruce fir so the actual cuts look somewhat different than the maps in the EA.

We are in the process of implementing the **Road and Trail Hazard Tree Project** which involves cutting hazard trees along roads and trails. Hazard trees within about one tree length each side of the roads and trails will be cut. Most roads and trails on the district that occur in lodgepole pine will be treated over the next three or four years.

We are currently writing the Environmental Assessment for the **Breckenridge Forest Health and Fuels Project**. This involves a community protection zone (400 to 600 feet wide) along the Forest Service Private land boundaries on the north side of the Swan River to Parkville, several zone areas in the Golden Horseshoe along Gold Run Gulch, East of Breckenridge and the homes in French Gulch and Baldy Road areas, and east of Town of Blue River to Hoosier Pass and along the west side of the Valley through Spruce Creek to the Peak 7 neighborhood. Timber units have been proposed in the South Barton and Middle Barton area. In the Golden Horseshoe timber units are proposed in the Gibson Hill, Prospect Hill, Lincoln Park and Brewery Hill areas. More timber units are proposed in the Indiana Gulch area. The project proposes both mechanical timber harvesting and hand treatments in areas inaccessible to logging due to steep slopes or limited access. Much of the community protection zone will be hand treatment or limited mechanical treatment directly adjacent to homes.

We are in the planning stages for a project tentatively named **Ophir Mountain Project** in the North Barton/Gold Hill/Ophir Mtn/Miners Creek area. This is essentially the same area the Upper Blue 2002 Project was to cover, but due to changed circumstances with the pine beetle kill we have not cut any of the timber units and are revamping that project with clear cuts instead of group patch cuts. The Wildland Urban Interface south of Frisco to Gold Hill has been cut as part of the implementation of the Upper Blue Project.

All projects except for the Breckenridge Forest Health & Fuels project will impact elk winter ranges in some way. We have or plan to have restrictions on the project activities in areas that overlap elk winter ranges that prohibit logging activity during winter and also have or plan to have restrictions on project activities to protect elk calving areas.

We agree that in the near term that with the loss of lodgepole pine over story, the vegetation will convert to more grass and forbs that would increase the available elk forage on winter ranges; but, we do have some concerns that we feel need consideration. One is that we expect to also see a flush of aspen regeneration as the sunlight stimulates aspen suckering in near dormant clones in the lodgepole pine stands. We want to encourage aspen and feel that too many elk may impact aspen regeneration on the winter range areas in a lot of the areas that we have planned projects. The second concern is the possible impact of elk on winter ranges grazing on the conifer regeneration and impacting the recovery of the lodgepole pine stands. At current population levels we have not seen heavy use on conifer regeneration but too high a population could impact both aspen and conifer reestablishment.

We are also seeing increasing recreation levels in the project areas in both summer and winter. Our biggest concern is winter recreation since much of the logging is taking place near homes and people tend to want to recreate out their back doors. As dead trees are removed, cover will also be removed so we will have more of an open forest over the next few years. The combination of increased winter recreation and lack of cover may affect elk use in these new openings. The concern is elk will be forced into other areas which may create new concentration areas that may result in impact to regenerating vegetation.

Given our large acreage of lodgepole pine timber projects that are being implemented or planned, we feel that much of the overall elk winter range on the district will be somewhat impacted. Although we have taken steps to protect elk habitat and allow elk use of habitat some elk winter range habitat will degrade in the short term and will likely force elk to utilize less area therefore increasing the possibility of overuse of localized areas.

Therefore, our recommendation for the E-13 (William Fork Elk DAU) would be Alternative 3, 4,700 to 5,500 elk post season. We feel that this is a balance of elk population with habitat and impacts to habitat that we foresee occurring. This alternative could also allow a higher number of elk to occur if we have several mild winters and lower harvest so we would have a "cushion" to allow the elk population to grow without damage to regenerating forests.

Please feel free to contact our District Wildlife Biologist, Vernon Phinney, if you have any questions about our comments and recommendation. He can be reached at 970-262-3491.

Sincerely,



JAN CUTTS  
District Ranger

cc: Vernon R Phinney



# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
Kremmling Field Office  
P.O. Box 68, 2103 East Park Avenue  
Kremmling, Colorado 80459-0068  
[www.blm.gov/co/st/en/fo/kfo.html](http://www.blm.gov/co/st/en/fo/kfo.html)



In Reply Refer To:  
6500 (CON020)

JUL 15 2010

Kirk Oldham  
Colorado Division of Wildlife (CDOW)  
P.O. Box 216 / 346 Country Road 362  
Hot Sulphur Springs, CO 80451

Dear Mr. Oldham:

The Bureau of Land Management (BLM) in Kremmling has reviewed the draft Data Analysis Unit (DAU) plans for E-8 and E-13 and attended a presentation at the Middle Park HPP committee's June meeting on the elk population objectives. The BLM has been asked to send a letter of support for one alternative in order to move forward in the planning process. We recommend the following elk population and sex-ratio objectives:

E-8

- 3600-4300 for the elk population objective (Alternative 2) and
- 21-26 for the bull to cow ratio (Preferred Alternative).

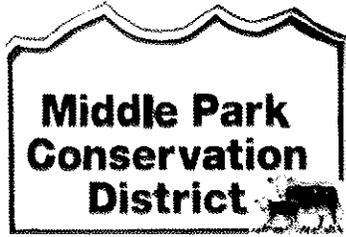
E-13

- 4700-5500 for the elk population objective (Alternative 3) and
- 21-26 for the bull to cow ratio (Preferred Alternative).

Thank you for the opportunity to provide comments for the DAU management plans for elk in the Middle Park (E-8 and E-13) herds. If you have any questions, please feel free to contact Megan McGuire at 970-724-3028.

Sincerely,

David Stout  
Field Manager



Middle Park Conservation District  
PO Box 265 106 S 2<sup>nd</sup> ST  
Kremmling, CO 80459  
Phone: 970-724-3456 Fax: 970-724-0807

July 16, 2010

Mr. Kirk Oldham  
Terrestrial Biologist  
Colorado Division of Wildlife  
P.O. Box 216  
346 Country Road 362  
Hot Sulphur Springs, Colorado 80451

Dear Mr. Oldham:

Please accept the enclosed comments on the E-13 and E-8 draft DAU plans from Middle Park Conservation District (MPCD). MPCD is one of Colorado's 76 conservation districts established under the Soil Conservation Act of 1937 to address conservation and stewardship of Colorado's natural resources. MPCD is responsible for on-the-ground conservation projects and technical support for private landowners within the District boundary. The District covers all of Grand and Summit Counties, which includes the area described for both E-13 and E-8.

For E-8, MPCD supports Alternative 2, a post-hunt population objective of 3,600 – 4,300 elk  
For E-13, MPCD supports Alternative 2, a post-hunt population objective of 4,100 – 4,900 elk

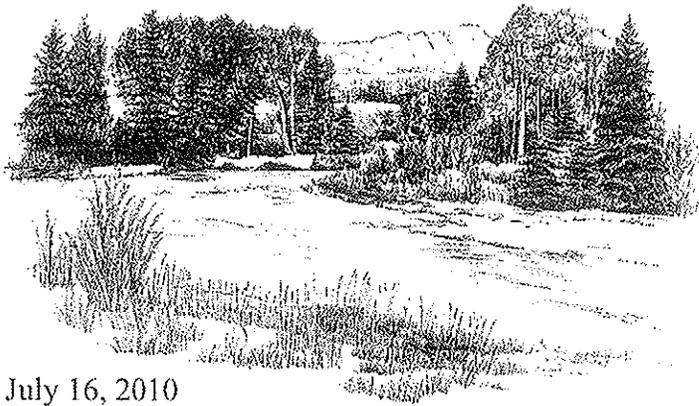
In addition to supporting the above alternatives, MPCD would also like to stress the importance of setting population objectives in accordance with habitat carrying capacity and the potential for habitat impacts. In particular, winter range and winter carrying capacity are limiting to elk populations, especially when they come into conflict with livestock and other big game animals such as mule deer.

The MPCD appreciates the opportunity to provide input to the DAU planning process. Please contact the District office with any questions at: (970) 724-3456.

Respectfully Submitted,

Middle Park Conservation District

# Blue Valley Ranch



July 16, 2010

Mr. Kirk Oldham  
Terrestrial Biologist  
Colorado Division of Wildlife  
P.O. Box 216  
346 Country Road 362  
Hot Sulphur Springs, Colorado 80451

Dear Mr. Oldham:

Thank you for the opportunity to provide input to the Draft DAU Plan for E-13, and for the informative presentation last Tuesday, July 6 in Kremmling. The Ranch appreciates the work the Colorado Division of Wildlife has done in managing the elk population in Middle Park, its efforts to mitigate game damage on private land, and its desire to consider public input in its planning process.

As you know, Blue Valley Ranch (BVR) is located entirely within DAU E-13, and the ranch has worked hard to provide habitat for a variety of wildlife, and Rocky Mountain elk in particular. A ground-based census conducted by Private Lands Consulting of Springville, UT, in 2009 found just fewer than 500 animals on BVR, which is just over 10% of the current population estimate of 4,700 in the post-season of 2009. This is a large population, despite the fact that the ranch constitutes less than 3% of the land area of the DAU. Efforts by BVR to provide for and manage this population have included habitat improvement projects, fencing of aspen stands to protect them from browsing, and recruiting local public hunters to harvest animals on ranch management hunts at no additional cost to them. BVR's annual elk harvest, totaling 550 cows over the last fifteen years, has ranged from 3.3% to 5.4% of the mean annual harvest of 1,265 for the DAU between 1985 and 2009.

Despite these efforts, BVR continues to see the impacts of a large elk herd on habitat. Elk browsing has been cited as a significant factor limiting recovery of aspen stands from the Sudden Aspen Decline (SAD) phenomenon (Worrall, et al. 2008), and BVR has documented elk browsing on over 86% of aspen shoots in unfenced aspen stands. The ranch would like to see further herd reduction to help alleviate habitat damage, as well as to relieve game damage to agricultural resources and infrastructure. We would also like to see a more thorough consideration of the potential impacts of a large elk herd on the deer population in Middle Park,

which is more sensitive to environmental stressors. Finally, the ranch would encourage the plan to establish population objective alternatives based more on habitat availability, especially limited winter range, as well as social and political factors.

Of the four alternatives listed in the draft DAU plan, Blue Valley Ranch supports Alternative 1, with a post-season population objective of 3,000 to 3,600 animals. We realize that this constitutes a change from the current population estimate of 4,700 in the post-season of 2009. However, we might echo the rationale cited on page 36 of the 1999 DAU E-13 Plan for establishing a population objective of 3,000 animals: "This option addresses habitat concerns... and should give landowners with damage problems some relief... reducing the herd to 3,000 animals in the posthunt population should take some of the pressure off the winter range and transition range – improving habitat condition and herd vigor. The deer population will also probably benefit from a reduction in the elk population." This rationale reflects many of the main concerns of Blue Valley Ranch, namely: limited winter range, game damage on private land, habitat impacts, herd vigor, and impact to the mule deer population. All of these issues are mentioned as constraints in the 2010 draft plan as well.

We hope that these comments are helpful in completing the DAU plan for E-13. Please feel free to contact me with any questions.

Sincerely,

A handwritten signature in cursive script that reads "Perry Handyside".

Perry Handyside  
General Manager

cc. Ron Velarde  
Lyle Sidener  
Becky Manly

## Oldham, Kirk

---

**From:** hssrobnjul@comcast.net  
**Sent:** Friday, July 16, 2010 12:45 PM  
**To:** Oldham, Kirk  
**Cc:** Crosby, Mike; Murdoch, Scott; Abram, Gene; becky.manley@state.co.us; Schwab, Shannon; Sidener, Lyle; Holland, Andy; Velarde, Ron; Broderick, John  
**Subject:** Middle Park Elk DAU plan comments

Hi Kirk,

Was unable to attend the public meetings but said I would be sending comments to you. Hope these comments are timely and of value to you. I am in agreement with much of the plan for the DAUs. To manage within a range is wise and prudent. The overall population numbers are also something I agree with as well as productive ranges of cow/calf numbers. It is the bull/cow ratio that I would like to comment on. I was somewhat surprised to learn that there is only one alternative for the bull/cow ratio offered in any of the alternatives. While 21 to 26 bulls per hundred cow elk is quite easily attained in these units with little or no change in current management strategy - I would like to advocate for an incremental increase in the bull/cow ratio with the result of more mature bulls in the population(s) - something along the order of 30 to 35 bulls per 100 cows. I believe this can be accomplished without going to a full-blown totally limited designation for these units - and without having to make drastic cuts to the current number of license offered or sold for these units. I definitely do NOT buy into the idea that it takes drastic cuts in current participation rates to achieve an increase in the bull cow/ratio...

A bit of history... As you recall when I spoke to you last week at lunch, after having conversations with then A-9 biologist Chuck Wagner and his boss, Jim Olterman, I had conversations with then statewide Big Game Manager John Ellenberger about creating BOTH quality elk and deer DAUs for Middle Park back when we switched to quality deer units for this (D-9) DAU. At that time, I explained to John that it would NOT take dramatic license restrictions to accomplish increases in buck/doe and bull/cow ratios. After some discussion, John agreed - but still declined to go forward with a recommendation of "Quality" designation for BOTH deer and elk due to overplaying the total numbers of quality elk units statewide and the overall possible fiscal impacts as well as the CWD concerns for both elk and deer... The reason we still went forward with deer had to do with the public support for totally limited deer licenses statewide that was going into effect anyway. Also, there were other DAUs nominated for quality elk management at the time that did not also have the CWD concerns and had more established public support than the Middle Park units... So we went with deer, but not elk at the time - but I can tell you that there was support for it (quality elk) - both within the Area and from the public!

Bottom line was that there was honest agreement that it doesn't take much in these Middle Park big game DAUs (D-9, E-8, E-13) to achieve increases in buck/doe and bull/cow ratios due to factors such as topography, land ownership and weather patterns (now add beetle killed lodge pole) for elk and deer to hide out in and evade hunting pressure - and John, Chuck and Jim all did agree with that... And that is why I would advocate for the slight increase now as you go forward with new DAU plans... I am still of the opinion that it would only take small changes (decreases) applied to the overall number of ES permits issues in primarily the first rifle elk season - and possibly the fourth rifle elk season - to see bull/cow ratios rise and remain in the 30 - 35 bull/cow range. I do not believe it will take much more than that. As I understand it, there has been a recent increase in archery elk licenses issues for these units and if that is in fact the case and that trend continues, it may take a cap on the total number of archery licenses at some point - but I'm not convinced we are there yet.

The muzzle loader tags are already totally controlled for these units. I DO NOT advocate for totally limited elk unit designation. I don't think it is necessary to achieve the slight increase in bull/cow numbers that I am trying to achieve. There would be no need to limit participation during the over the counter elk seasons if steps are taken during 1st and 4th to limit participation... Just as the current bull/cow ratio happens to be up around 35+bulls /100 cows in E-13 right now without ANY manipulation - I believe you could achieve this annually without greatly cutting hunter participation with the exception of those two seasons.

I am offering up my own participation here Kirk as I hunt the 1st rifle season for elk in E-13. Having seen the quality of bulls increase slightly since the advent of our current season structure, I firmly believe that this current structure allows for an increase in bull/cow ratio to be achieved with a minimal impact to current hunter participation rates... I know that as a wildlife manager of this area for over twenty years - there is definitely greater support for an effort such as this - as opposed to going totally limited on elk - but even that effort is probably still at the 50-50 point as far as overall public support. I know that Blue Valley Ranch supports any effort to pursue "quality" as it pertains to bull/cow increase as do a number of other private landowners, outfitters and individuals that reside and hunt in these units. If you doubt that or you feel the need to see how extensive a list of supporters I can drum up for this effort - say the word and I will pass this email along to them and we can see where it goes in terms of support - but that is not my intent here. I just happen to believe that this is a realistic request and quite doable under the current framework.

Thanks for your time and effort in this regard Kirk. I have no plans to "push" for this opinion to carry the day - but I do hope it rings a bell with the Area personnel and that they feel it is something they can support. I cannot imagine that it bears any heavy fiscal cost to achieve in terms of lost revenue... and I would definitely like to see those numbers if you care to convince me otherwise! Promise I won't cry like a baby if it cannot happen! Believe me, I am not dissatisfied with the current state of affairs! I am getting ready for elk season as we speak!

Would love to hear from those cc'd above as to their opinions on this latest essay...

Thanks for the time!

Rob