

DAU D - 42 (Rifle Creek)

EXECUTIVE SUMMARY

MAY 2007

GMUs: 33 Land Ownership: 24% Private, 45% USFS, 29% BLM, 2% State

Post-hunt Population Objective: 7,700 – 9,400 **2006 Estimated:** 8,300
Previous: 8,400

Post-hunt Composition Objective: 30 – 35 bucks: 100 does **2006 Observed:**
30.9 **2006 Modeled:** 33.0 **Previous:** 20

Figure 1. D-42 Posthunt Population Size

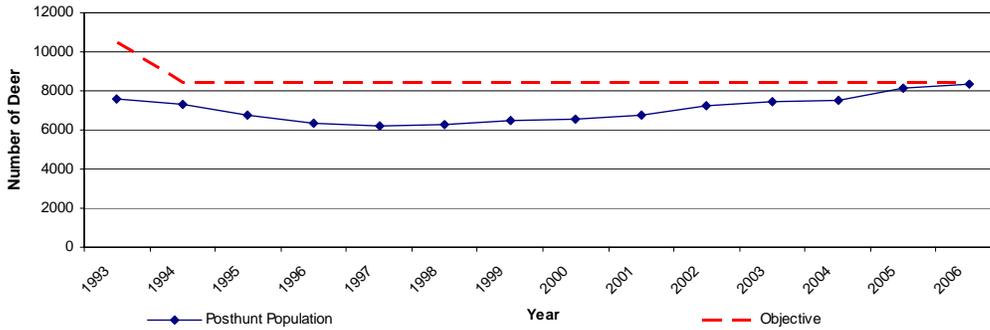


Figure 2. D-42 Harvest

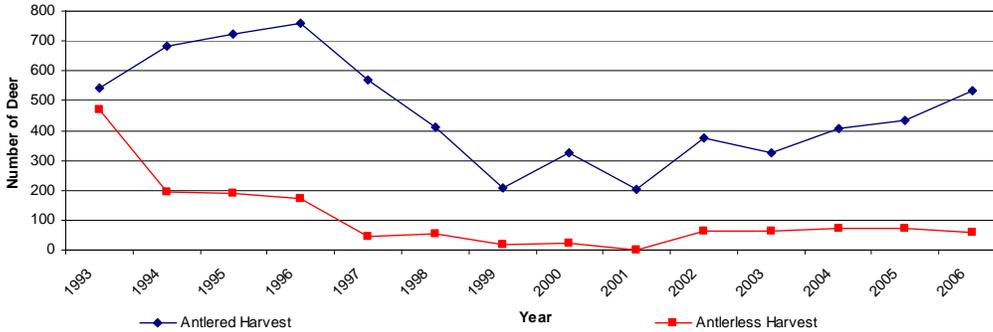
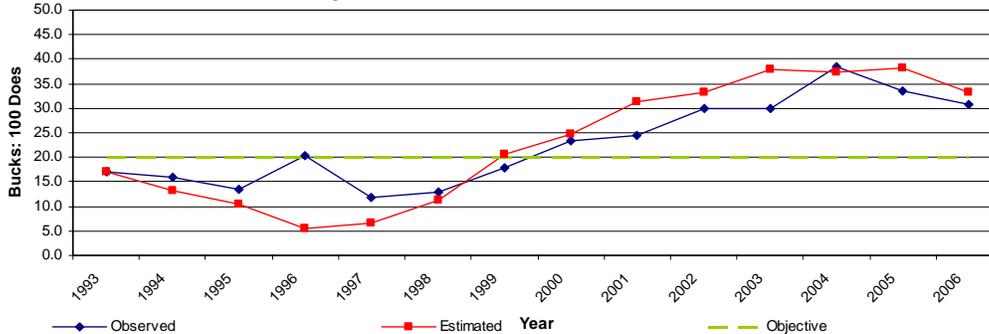


Figure 3. D-42 Posthunt Bucks: 100 Does



D- 42 BACKGROUND

The Rifle Creek D - 42 DAU is located in west central Colorado, north and east of Rifle, Colorado. Since 1994, the population objective for the Rifle Creek deer herd has been 8,400 animals. The sex ratio objective is 20 bucks: 100 does.

The deer population was relatively high in D - 42 during the early 1980's through the early 1990's. Since that time, the herd declined dramatically, and then rebounded moderately in recent years. The decline of this herd mirrored the falling numbers in most mule deer populations throughout Colorado and the Western U.S. Recent years have shown increased numbers of deer in D - 42 and current models estimate a population of 8,300 deer.

The CDOW has conducted aerial sex and age composition surveys in D - 42 since the late 1970's. Early records in the 1980's show that total buck: doe ratios were around 17 bucks: 100 does. These ratios have generally increased to recent levels of 20-25 bucks: 100 does, in large part due to totally limited male licenses implemented in 1995. The average buck: doe ratio in the DAU for the last 10 years is approximately 25 bucks: 100 does. There were 30.9 bucks: 100 does observed during post-hunt classifications in 2006

The post-hunt fawn: doe ratios are indicators of how successful the reproduction was for the past spring and how well fawns survived until December. This is a critical indicator of the condition of the herd. Fawn production in the DAU has been good over the years, generally remaining between 50 and 70 fawns: 100 does. In the last ten years, however, production has only averaged 48 fawns: 100 does. In 2006, there were 61.8 fawns: 100 does observed during post-hunt classifications.

Deer harvest in the DAU D - 42 has changed substantially over time, peaking in the late 1980's and early 1990's, followed by significant reductions, particularly in doe harvest. Between 1980 and 1990, buck harvest averaged over 900 animals per year and doe harvest averaged nearly 300 animals per year. Since 1993, harvest averaged approximately 450 bucks and less than 100 does per year. There has been very limited antlerless hunting in D - 42 since 1998: antlerless licenses were issued primarily to prevent damage situations. In 2006, 532 bucks and 60 does and fawns were harvested.

SIGNIFICANT ISSUES:

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

Meetings were held to solicit input from the USFS, BLM, the local public, and the Garfield County Board of County Commissioners. A questionnaire was available at all public meetings and on the DOW website to encourage public participation.

The most significant issue that was identified during the DAU planning process was habitat quality and quantity, particularly on winter ranges. Winter range habitat quality and quantity was the most frequently identified issue by the general public, CDOW employees, the HPP committee, and land management agencies. Another issue is high motor vehicle mortality on major roads due to increased traffic. There is also some concern, primarily within the CDOW, that long-term fawn: doe ratios are not as high as would be expected. It is possible this is due to density-dependence related to winter range declines. Many stakeholders expressed interest in increasing buck: doe ratios and thereby improving buck quality.

Generally, most stakeholders indicated that deer population size and composition are at acceptable levels, although there is significant demand for larger bucks. The majority of respondents were satisfied with current management and the general consensus was to maintain the population size at current levels and increase the buck: doe ratio objective to 30 – 35 bucks: 100 does.

D - 42 MANAGEMENT ALTERNATIVES

Three post-hunt population objective alternatives were proposed for D - 42 during the DAU planning process: (1) 6,700 – 8,400, (2) 7,700 – 9,400, or (3) 8,700-10,400. This population has been at or slightly below objective for the last several years, and a stable to slightly increasing trend will maintain the population within the current objective range.

Three post-hunt composition objectives were proposed for D - 42 (1) 20-25 bucks: 100 does; (2) 25-30 bucks: 100 does; or (3) 30-35 bucks: 100 does. Alternative 1 would maintain the current objective, and decrease buck ratios, alternative 2 would maintain recent buck ratios, while alternative 3 would increase buck ratios.

As a result of this DAU planning process, a final population size objective of 7,700 – 9,400 deer was selected and a population composition objective of 30 – 35 bucks: 100 does was selected to manage the D-42 deer herd.

**RIFLE CREEK
DAU D - 42
HERD MANAGEMENT PLAN**

Prepared by:
Stephanie Duckett
Terrestrial Biologist, Grand Junction
Colorado Division of Wildlife
711 Independent Ave.
Grand Junction Colorado

EXECUTIVE SUMMARY	III
INTRODUCTION AND PURPOSE	1
DESCRIPTION OF DATA ANALYSIS UNIT	3
LOCATION	3
PHYSIOGRAPHY	3
VEGETATION	4
LAND OWNERSHIP	4
LAND USE	5
HISTORICAL HERD MANAGEMENT	8
PROLOGUE	8
POPULATION ASSESSMENT PROCEDURE OVERVIEW	8
POST-HUNT POPULATION SIZE	9
POST-HUNT HERD COMPOSITION	10
HARVEST HISTORY	11
HUNTING PRESSURE AND HUNTER NUMBERS	13
CURRENT HERD MANAGEMENT	14
CURRENT POPULATION AND COMPOSITION OBJECTIVES	14
HARVEST MANAGEMENT	14
HABITAT RESOURCE	15
HABITAT DISTRIBUTION	15
CONFLICTS	20
ISSUES	22
ISSUE SOLICITATION PROCESS	22
ISSUE IDENTIFICATION	22
ALTERNATIVE DEVELOPMENT	26
POST-HUNT POPULATION AND SEX RATIO OBJECTIVE ALTERNATIVES	26
POST-HUNT POPULATION AND SEX RATIO OBJECTIVE ALTERNATIVES	26
IMPACTS OF OBJECTIVE ALTERNATIVES	26
CDOW PREFERRED POPULATION SIZE AND COMPOSITION ALTERNATIVES	28
PREFERRED POPULATION SIZE OBJECTIVE ALTERNATIVE	28
PREFERRED POPULATION COMPOSITION OBJECTIVE ALTERNATIVE	28
PREFERRED ALTERNATIVE JUSTIFICATION	28
APPENDIX A: DEER POPULATION DYNAMICS	I
APPENDIX B: TEXT OF COMMENTS FROM THE WHITE RIVER NATIONAL FOREST	IV
APPENDIX C: TEXT OF COMMENTS FROM BUREAU OF LAND MANAGEMENT, GLENWOOD SPRINGS FIELD OFFICE	V
APPENDIX D: TEXT OF COMMENTS FROM LOWER COLORADO RIVER HPP COMMITTEE	VII
QUESTIONNAIRE ANSWERS	VIII
TEXT OF WRITTEN PUBLIC COMMENT	XII
TEXT OF COMMENTS FROM THE COLORADO MULE DEER ASSOCIATION	XV
APPENDIX F: PUBLIC QUESTIONNAIRE	XVI

INTRODUCTION AND PURPOSE

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

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

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

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

Once these population and composition objectives are set through the DAU planning process, the CDOW has the responsibility to work to achieve these goals on a yearly basis. The population objective drives the most important decision in the establishment of the annual big game hunting seasons: how many

animals need to be harvested to maintain or achieve the population objective. To reach these objectives, the CDOW uses a method called “Management by Objectives” approach (Figure 1).

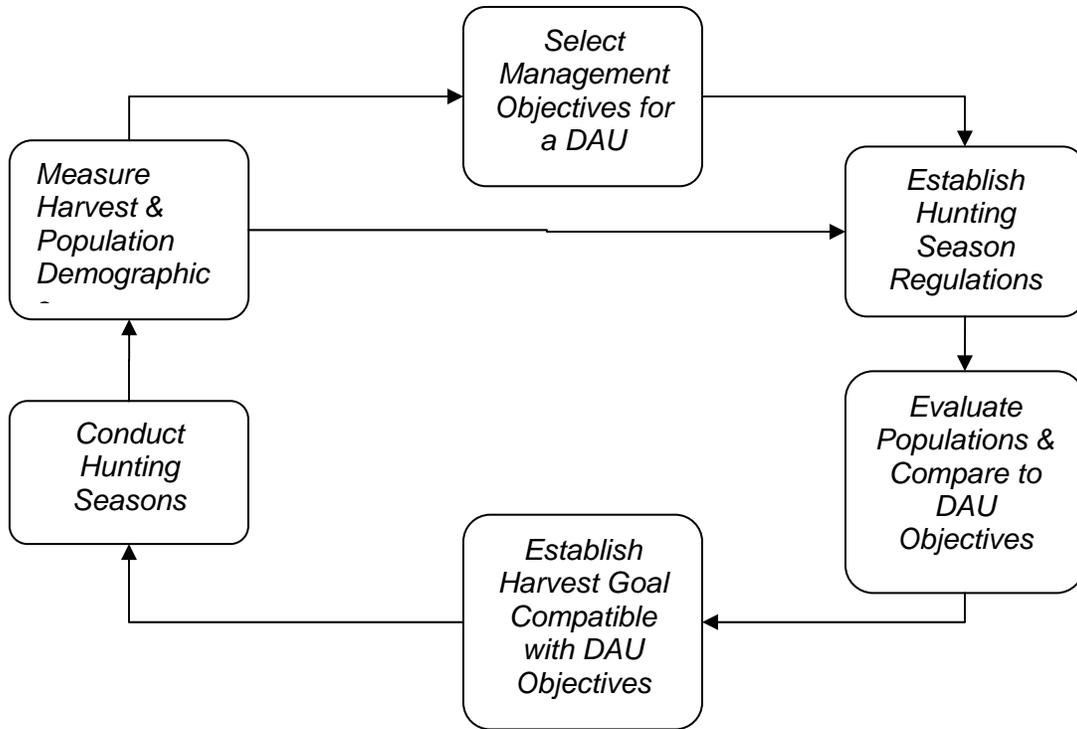


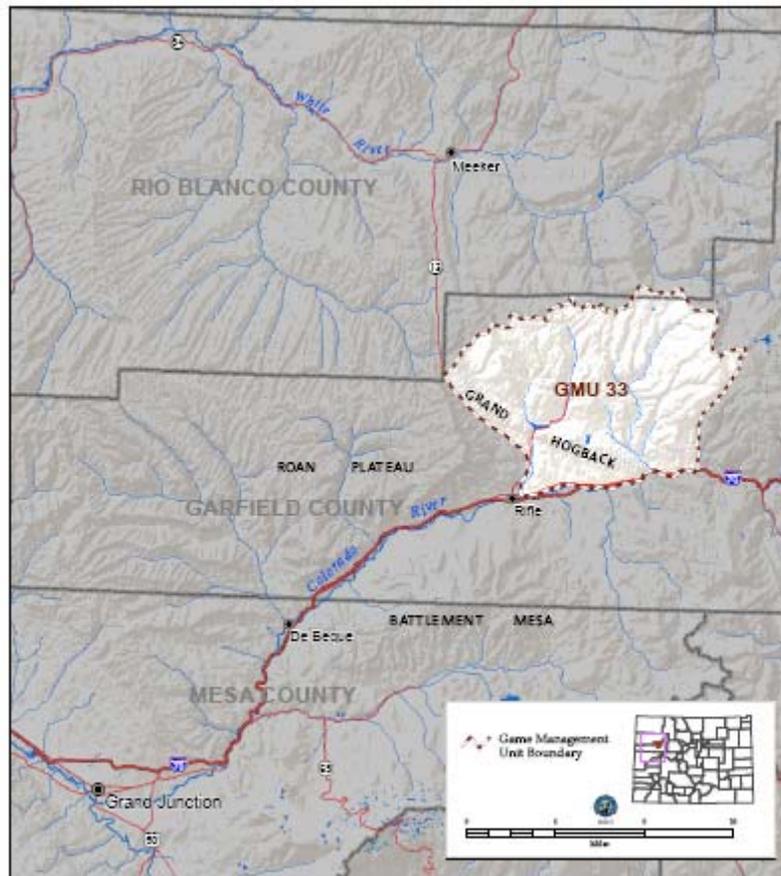
Figure 1. CDOW's Management by Objective Process.

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

DESCRIPTION OF DATA ANALYSIS UNIT

Location

Data Analysis Unit D - 42 is located in west-central Colorado and is called the Rifle Creek DAU. It is bounded on the north by the Colorado – White River divide, on the east by Canyon Creek, on the south by the Colorado River, and on the west by Hwy. 13 (Figure 2).



Location of Mule Deer DAU D-42 (GMU 33), West-central Colorado.

Figure 2. Location of DAU D - 42 in west-central Colorado.

Physiography

Elevations vary from approximately 11,400 ft. near Blair Mt. in the northeast portion of the DAU, south to the flood plain of the Colorado River at approximately 5,400 ft.

The Grand Hogback runs northwest to southeast near the southern border of the DAU. The hogback rises sharply from 6,900 ft. to 7,300 ft. in under 1 mile horizontal distance, creating a major topographic division in the DAU. The Grand

Hogback creates a funnel effect, pushing mule deer down into the Rifle Creek drainage.

The northern half of the D-42 is characterized by large, steep drainages that flow down from the Flat Tops into the central areas of the DAU. These canyons create a variety of east- and west-facing slopes, which provide little suitable winter range. The southern half of the DAU has more south-facing slopes than the north side, but still provides little suitable winter range due to bisecting east-west drainages. Deer are forced by deep snows to lower terrain near Rifle.

Annual precipitation ranges from approximately 20 inches near Rifle, to 40 inches at higher elevations in the northern part of the DAU. Much of the annual precipitation falls in the form of snow. The mean annual temperature in Rifle is 43^o F.

Vegetation

Vegetation in this DAU varies due to the wide range of elevations that occur. The high precipitation in the northern portion of the DAU allows for very different vegetative communities than does the significantly lower precipitation found in the near Rifle.

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

Irrigated cropland and grassland with half-shrub mixtures and grass/alfalfa meadows are found in the valley. Irrigated crops include grains such as wheat, barley, and oats, and alfalfa and grass grown for pasture and hay. River bottoms along the Colorado River are dominated by cottonwood trees and other species including willows, boxelder and alders. Tamarisk is also found along the river corridor.

Land Ownership

The Rifle Creek deer DAU contain a mixture of public and private lands (Figure 3). Approximately 75% of the lands within this DAU are public property; 45% is managed by the United States Forest Service (FS) and about 29% by the Bureau of Land Management (BLM). Approximately 2% is managed by the State of

Colorado. United States Forest Service lands are part of the White River National Forest. The BLM lands are managed by the Glenwood Springs District office. Privately owned lands make up 24% of the total.

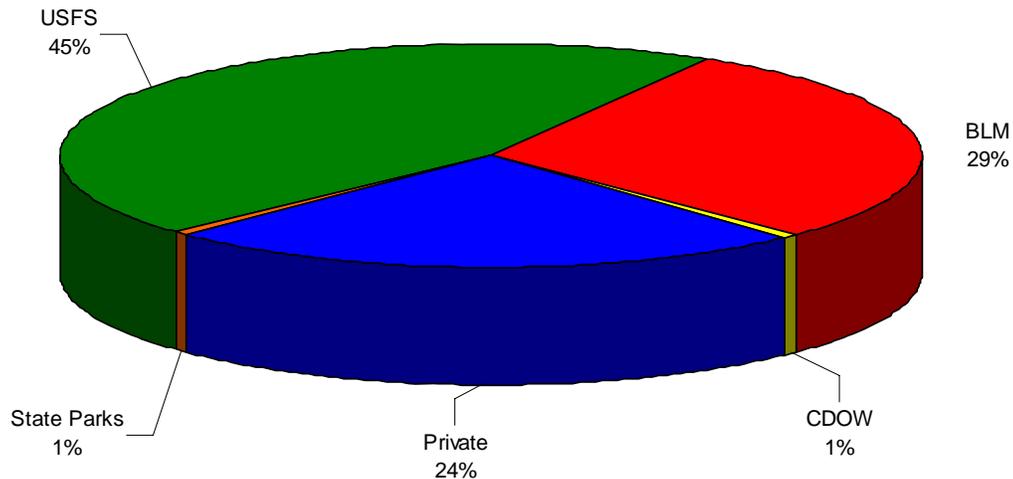


Figure 3. Land Ownership in D - 42

Population centers in this DAU are found on the southern border near the Colorado River and include Rifle, Silt, and New Castle. Like many areas in western Colorado, public lands are usually situated at higher elevations and private lands are found at lower elevations where the land is more suitable for farming, ranching, and communities. D - 42 is 416 square miles in size. The Forest Service manages approximately 182 square miles and the Bureau of Land Management manages about 121 square miles. There are approximately 101 square miles of private land in the DAU.

Land Use

Because of the DAU's wide range in elevations, there are a variety of uses occurring on the land. These range from livestock production to some of the best big game hunting in western Colorado and the western United States.

- **Agriculture:**

In the southern portion of the DAU, on either side of the Grand Hogback, agriculture is the primary land use, including corn, various small grains, and the

production of hay for livestock. Much of the private land in the DAU is used to graze livestock during the spring, fall, and winter months. Cattle and sheep ranchers also graze livestock on USFS and BLM land during various seasons of the year. On USFS lands, livestock are grazed on allotments during the summer and during the fall ranchers move the livestock to home ranches for the winter.

- **Timber Harvest:**

Commercial timber is sold and harvested on the White River National Forest. Spruce/fir timber provides wood for the construction industry. Aspen has also been harvested, and has been used for the construction of wafer board for the building industry. Some firewood is harvested, both commercially and privately.

- **Residential Housing**

Increasing residential development and the resulting impacts on deer habitat are two of the most important concerns identified during the DAU planning process. The DAU has three population centers that occur along the Colorado River. Rifle is the largest town (Table 1).

The DAU has seen a great deal of population growth within recent years, primarily in the southern portion along Interstate 70. The majority of new housing developments have occurred in deer winter range, fragmenting former sagebrush and agricultural lands. The areas near Rifle, Silt, and Newcastle, are seeing significant conversion of agricultural lands to suburban housing developments. The resulting loss of deer and elk winter range is a major and increasing concern within the DAU.

COUNTY	TOWN	POPULATION
Garfield	Rifle	8,000
	Newcastle	3,100
	Silt	2,300
	Total County	52,200

Table 1. Human Population Estimates within DAU D-11.

- **Recreation:**

Recreation is probably one of the most visible and extensive uses occurring on USFS and BLM lands in this DAU. Lakes, reservoirs, and streams are used by fishing recreationists throughout the year and backcountry hiking, horseback riding, biking, and off highway vehicle (OHV) trails provide numerous days of recreational activity for a large number of visitors. During the fall, big game

hunting is a major event in the DAU. For the last three years, D - 42 has provided hunting opportunity to an average of almost 1,300 deer hunters per year. Approximately 1,000 deer hunters are in the field during the two rifle hunting seasons in October and November. Archery and muzzleloading seasons attract another 250 hunters during late August and September. Vehicular access varies throughout the USFS and BLM lands but an extensive network of roads provides ample access to many areas that are open to multi-purpose land uses.

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

There is minimal natural gas and oil exploration in the DAU, although there is some potential development south of the Grand Hogback. Extensive reserves of natural gas have been discovered in adjacent DAU's. It is likely that related impacts such as increased population, recreation, and other disturbances will affect D-42.

HISTORICAL HERD MANAGEMENT

Prologue

The total number of animals in a big game population fluctuates throughout the year. Normally, the population peaks in the spring just after birth of the young. Populations then decline throughout the year as natural mortality and hunting seasons take animals from the population. Traditionally, the CDOW uses post-hunt populations (immediately after conclusion of the last hunting season) as a frame of reference when we refer to the size of a population of deer. In this manner we have established a reference point and can eliminate confusion when referring to populations.

Realistically, deer population objectives are determined by taking into account many different variables to arrive at a final population objective number. Some prominent variables include biological data, political and economic considerations, recreational interests, domestic livestock concerns, and vegetative capabilities. Population objectives are often set at a level consistent with the herd's maximum sustained yield (MSY). However, it is very difficult to determine the MSY and carrying capacity for any given area and herd (see Appendix A for a brief summary of the concept of MSY and carrying capacity).

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

Population Assessment Procedure Overview

Estimating populations of wild animals over large geographic areas is an extremely difficult and inexact science. Our current method of determining deer populations is based upon population models, which integrate measured biological factors into a computer generated population simulation. The biological factors used include post-hunt sex and age ratios data taken from helicopter surveys in December and hunter harvest information. The surveys provide baseline information which is used to align the models. Hunter harvest surveys are another factor. Other data requirements include winter survival for different age classes and sexes, wounding loss, and winter severity factors. If better information becomes available, such as new estimates of survival rates, wounding loss, sex ratio at birth, density estimates, or new modeling techniques and programs, the CDOW reserves the right to use this new information and the new techniques. Making these changes may result in significant changes in the population estimate. It is recommended that the population estimates presented in this document be used only as an index or as trend data. They represent CDOW's best estimate of populations at the time they are presented.

Post-hunt Population Size

Deer populations in D - 42 have fluctuated over the years (Figure 4). Populations were at their maximum during the late 1950s and early 1960s. Harvests throughout Colorado were also at their highest levels during this period. Deer herds had been building in a response to improved game management practices. Habitat conditions apparently were ideal and predator control effort may have contributed enough to allow for unprecedented fawn survival. Since population size and harvest are usually directly related, then the assumption that populations were at their peak is likely correct. Populations declined during the late 1960s and into the early 1970s, possibly by as much as 40%. Why this decline occurred is unknown. Hunting seasons remained liberal during this time and winter losses may have increased. Habitat and vegetative conditions may also have changed in a way that adversely impacted mule deer.

Populations peaked again in the early 1980s. A large die-off occurred during the very severe winter of 1983-84. Virtually all fawns died over winter, which started early in mid-November and lasted well into April. An estimated 20-30% of adult animals also succumbed to the long, cold winter. By 1997, the herd had declined to nearly 6,000 animals. In the last 5 years, this population has rebounded slowly and is back to near the objective levels. The major factor that appears to be slowing the population's ability to rebound is the lack of recruitment of fawns into the adult population. Antlerless harvest has been used in an effort to improve fawn recruitment. In 2006, 61.8 fawns: 100 does were observed during classification flights. This is a significant improvement and a trend that will hopefully continue.

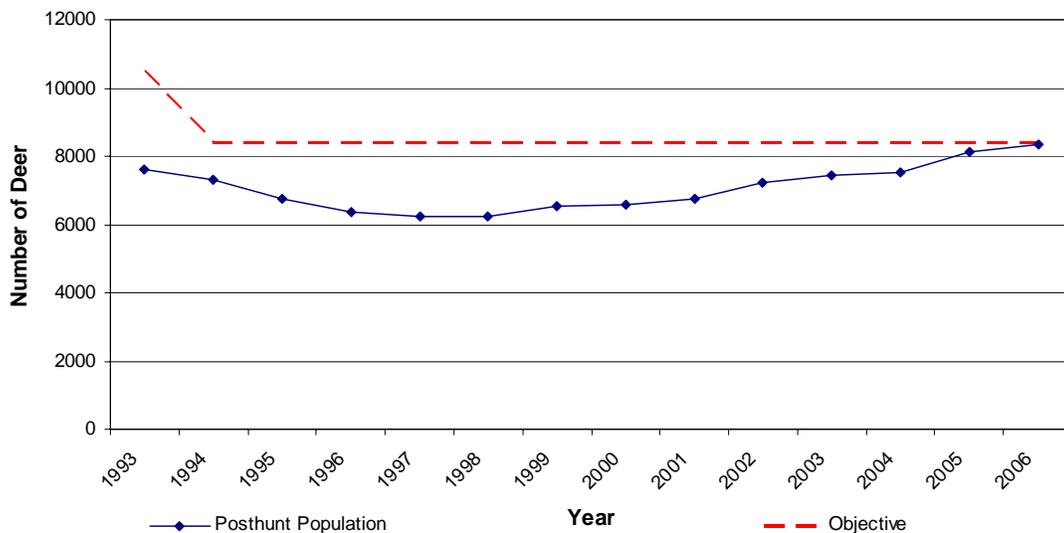


Figure 4. Post hunt Population Estimates for D - 42.

Post-hunt Herd Composition

Since 1986, the CDOW has conducted aerial sex/age composition surveys in D - 42. These classifications are designed to sample the existing post-hunt population and determine the ratios of bucks and fawns to does. They are often mistaken by the public as total counts of the population. This is not the case; the data only represent a sample of the population. The results are presented as the number of bucks: 100 does and the number of fawns: 100 does. The data provides information on reproductive success, survival of fawns, and information on the ages of the adult male segment of the population.

▪ Buck: Doe ratios

Generally, buck: doe ratios above 10 bucks: 100 does are sufficient to sustain a relatively healthy herd. The number of bucks: 100 does has varied from a low of nearly 13 in the mid 1990's to nearly 40 in recent years. The average buck: doe ratio from 1993-2006 was 24.6 (Figure 5).

During the 1980's, the buck: doe ratio averaged in the high teens. During this time any buck was legal and restrictions, such as antler point limitations, were few. Antler point restrictions were in effect between 1986 and 1991. Some increase in the buck: doe ratio was observed, but, generally, there was an overall decrease in mature bucks. In 1999, all deer hunting in Colorado, including D-42, became completely limited. Buck: doe ratios have shown some improvement as a result of completely limited buck hunting.

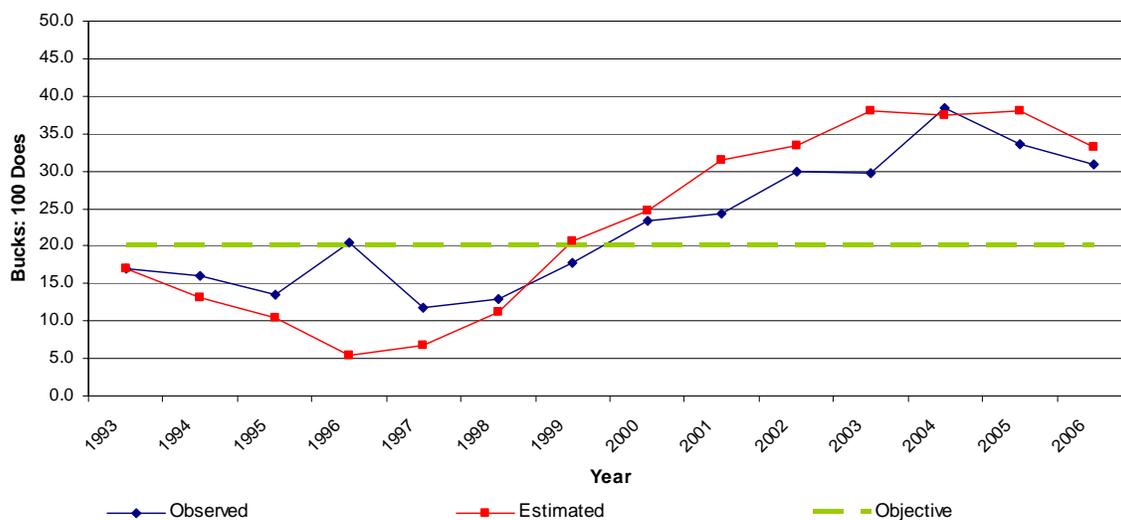


Figure 5. Buck: Doe Ratios in D - 42.

▪ **Fawn: Doe ratios**

As discussed above, mule deer classifications have been flown consistently for over 20 years. The post-hunt fawn: doe ratios are indicators of how successful the reproduction was for the past spring and how well fawns survived until December. This is a critical indicator of the condition of the herd. Good fawn recruitment indicates a strong, healthy herd, while low recruitment may show poor or declining herd health. Generally, fawn production at 75-85 fawns/100 does indicates a growing deer herd. When fawn production drops below 60 fawns: 100 does, there is concern for the herd's ability to sustain itself.

Since the late 1980's, fawn: doe ratios have fluctuated and have shown an overall decline. This decline in productivity mirrors the decline in the overall population numbers. Although this herd has increased in recent years, it is likely that a decline in winter range quantity and quality is creating a situation of density-dependence and the deer herd has reached the population limit the winter range can support.

The lowest fawn ratios were seen in 1998, when only 40 fawns: 100 does were observed (Figure 6). This herd has averaged 44 fawns: 100 does since 1993. In 2006, 61.8 fawns: 100 does were observed during classification flights. This is a significant improvement and a trend that will hopefully continue.

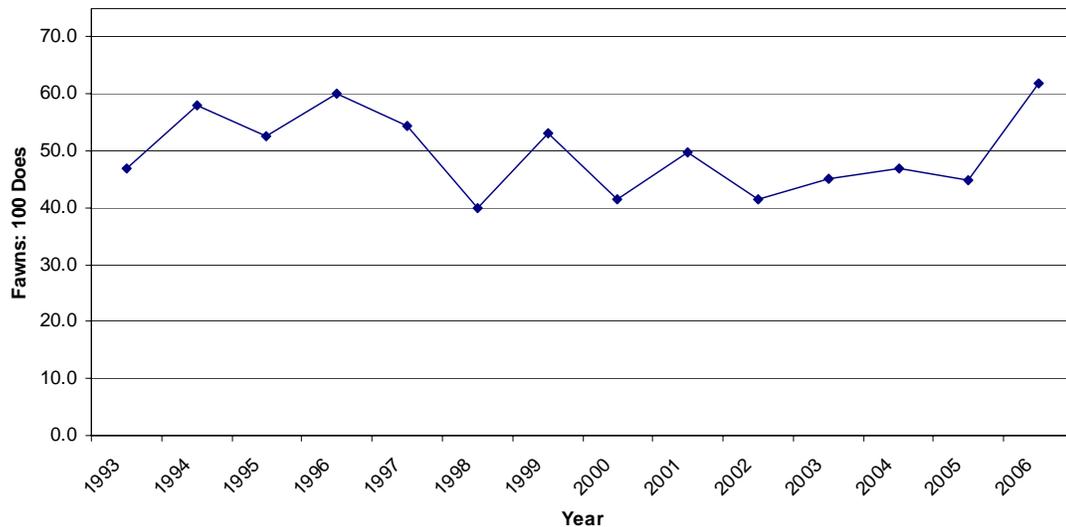


Figure 6. Fawns: 100 Does in D - 42.

Harvest History

Deer harvest in the DAU D - 42 has varied by substantially over the years. Buck hunting was unlimited during the rifle seasons until 1999, when all deer harvest throughout the state was completely limited.

Buck harvest peaked in the early 1980's, followed by gradual reductions, particularly since 1990 (Figure 7). Doe harvest was minimal in the 1980's and peaked in the early 1990's. The highest harvests occurred in the late 1980's through the early 1990's. In 1989, 1,125 antlerless animals were harvested. The highest buck harvest of 1,291 occurred in 1981. Doe harvest has been minimal since 1999, and has generally been used to control or prevent damage. Generally, the highest harvests have occurred in conjunction with the highest populations. Lowest harvests have occurred during the last few years when the CDOW has been attempting to increase the deer population from current low numbers.

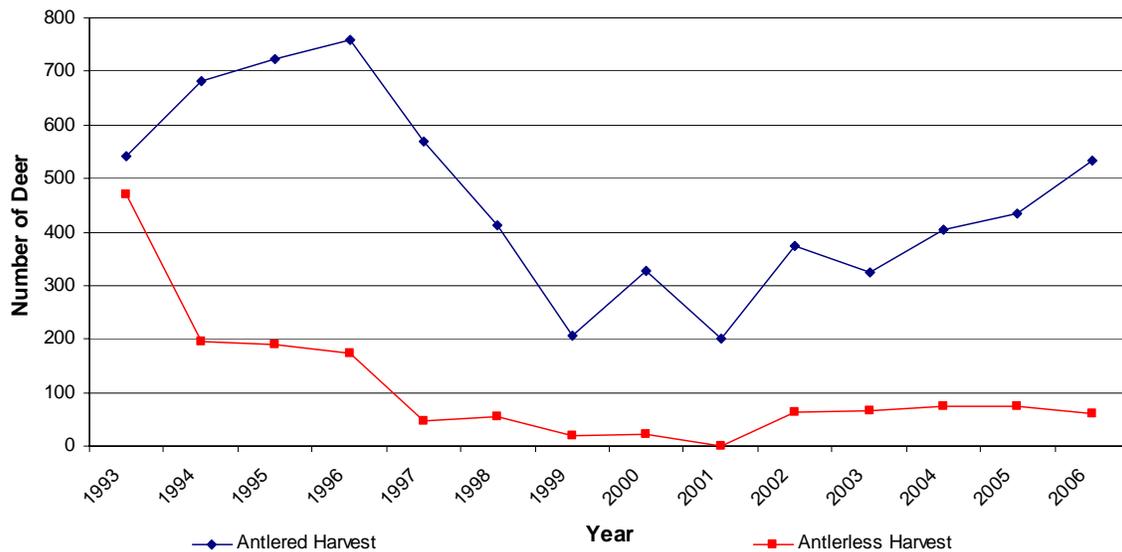


Figure 7. Annual Harvest in DAU D - 42.

Deer seasons have evolved from being quite simple to rather complicated. The driving force behind this change has been due to the dramatic deer population decline. The herd numbers of today, coupled with the many factors exerting their force on populations, have driven the hunting process to the format we have now. In the 1970's there were very few non-rifle hunters. Now, archery and muzzleloading seasons attract approximately 200 hunters during late August and September, and account for over 5% of the annual harvest.

The rifle hunting seasons have also changed. In the 1950's and 1960's there was one fall hunting season. Now there are three rifle seasons for deer, and while hunter demand is very high, relatively few licenses are issued each year.

Hunting Pressure and Hunter Numbers

Hunting pressure and hunter numbers have mirrored the population trends in this unit. Following declines in herd numbers in the early 1990's, the CDOW issued fewer licenses, decreasing overall hunter numbers (Figure 8). License numbers have remained low in recent years in an attempt to maintain lowered harvest and increases in the population.

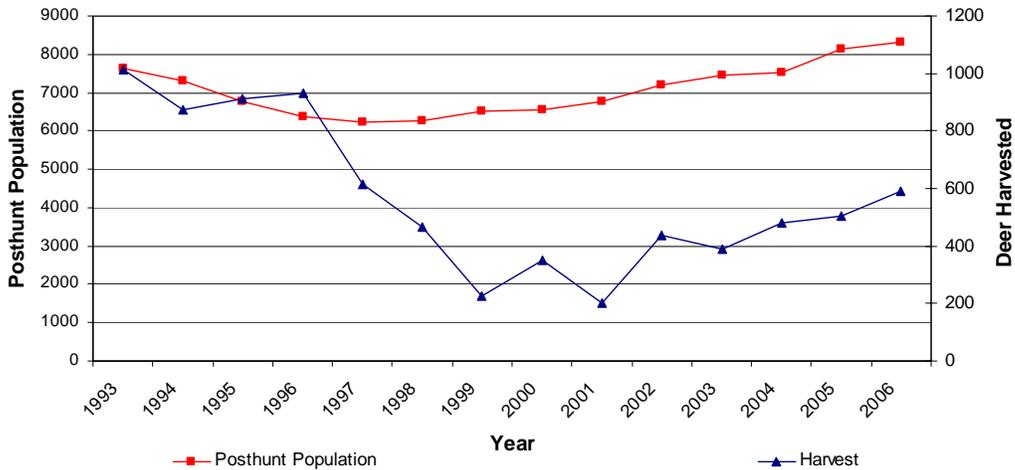


Figure 8. Harvest vs. Post hunt Population Size in D-42.

Since 1999, when licenses became totally limited, success rates have increased, necessitating a further decrease in the number of licenses available (Figure 9).

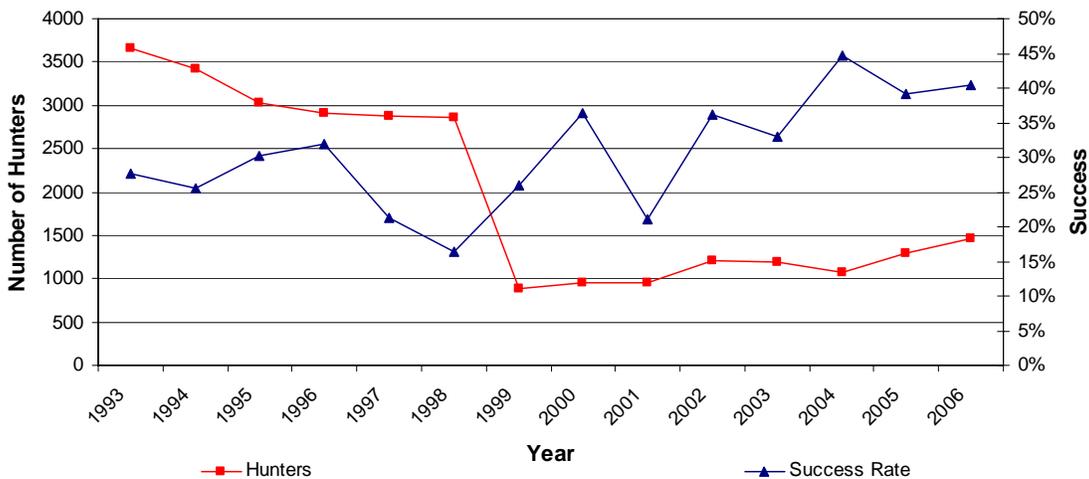


Figure 9. Harvest vs. Success Rate in D-42.

CURRENT HERD MANAGEMENT

Current Population and Composition Objectives

The current population objective for the Rifle Creek DAU is 8,400 deer. This objective was approved through the DAU planning process completed in 1994. The current population estimate is approximately 8,300 deer. This is just under the population size objective. Current management efforts are focused on slightly increasing herd size and improving fawn: doe ratios.

The current composition objective is 20 bucks: 100 does. In 2006, 30.9 bucks: 100 does were observed. Since 2000, annual flights have classified an average of approximately 31 bucks: 100 does, which is above the current objective.

Harvest Management

This DAU has been managed since 1999 with completely limited antlered licenses and very few antlerless licenses in an effort to increase the population size. Doe harvest has come primarily from damage control situations. Declining herd numbers since the early 1990's caused the CDOW to be aggressive in scaling back annual harvest objectives in this DAU since 1999. The management emphasis in this DAU is on providing maximum buck hunting opportunity while maintaining and increasing the size of the herd.

▪ Antlered Licenses

The CDOW initiated completely limited antlered licenses in this DAU in 1999. A harvest objective of less than 500 antlered animals has been maintained since that time. A 4th rifle season was instituted in 2006 to provide a high quality, highly sought-after hunting opportunity to a very small number of hunters.

▪ Antlerless Licenses

Other than 2002, antlerless harvest has been maintained at low levels in this DAU. Most antlerless harvest has been to prevent damage through dispersal and PLO hunts. Since 1999, harvest has generally averaged around 50 does each year.

HABITAT RESOURCE

Habitat Distribution

- **Deer Overall Range**

Deer are found throughout DAU D - 42 with the general exception of the largest human population areas (Figure 10). Deer herds move across the remainder of the DAU during the year, utilizing different areas during different seasons.

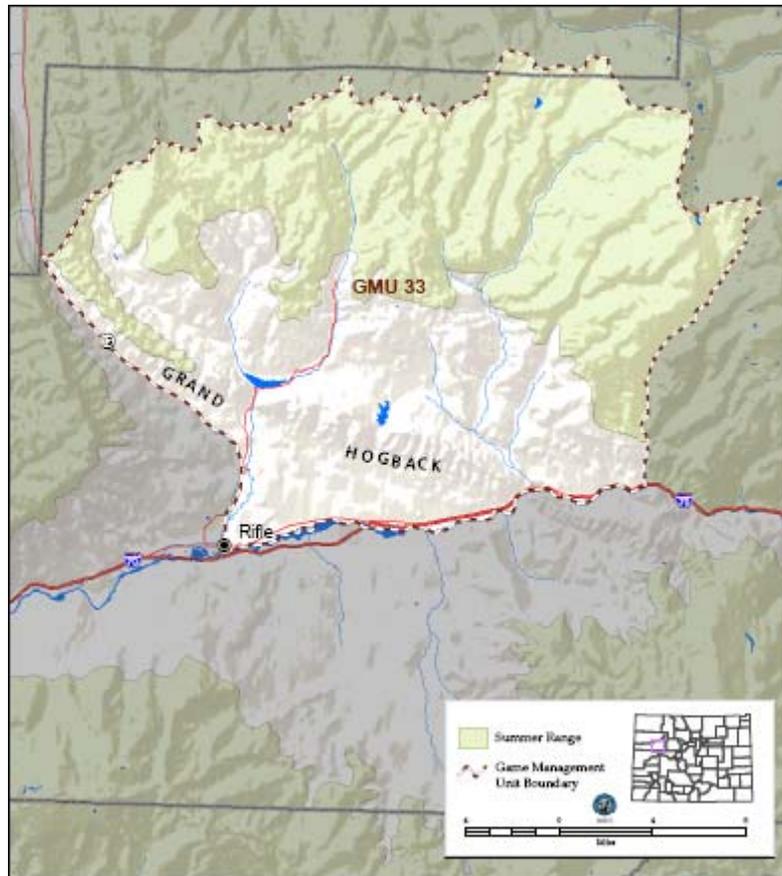


Location of Mule Deer DAU D-42 (GMU 33), West-central Colorado, showing Mule Deer Overall Range.

Figure 10. Deer Overall Range in DAU D - 42.

- **Deer Summer Range**

Deer in D - 42 summer throughout the DAU, although the majority summer in the higher elevations (Figure 11). In the spring, they tend to follow the retreating snowline and subsequent green-up in vegetation. Although some deer remain at low elevations year-round, the majority move to higher elevation summer ranges. There are nearly 230 square miles of summer range. The quality of summer range is important for deer to ensure they recover from winter weight loss, does can support late fetal development and lactation, and all animals in the population go into winter in good body condition.



Location of Mule Deer DAUD-42 (GMU 33), West-central Colorado, showing Mule Deer Summer Range.

Figure 11. Deer Summer Range within DAU D - 42.

- **Deer Winter Range**

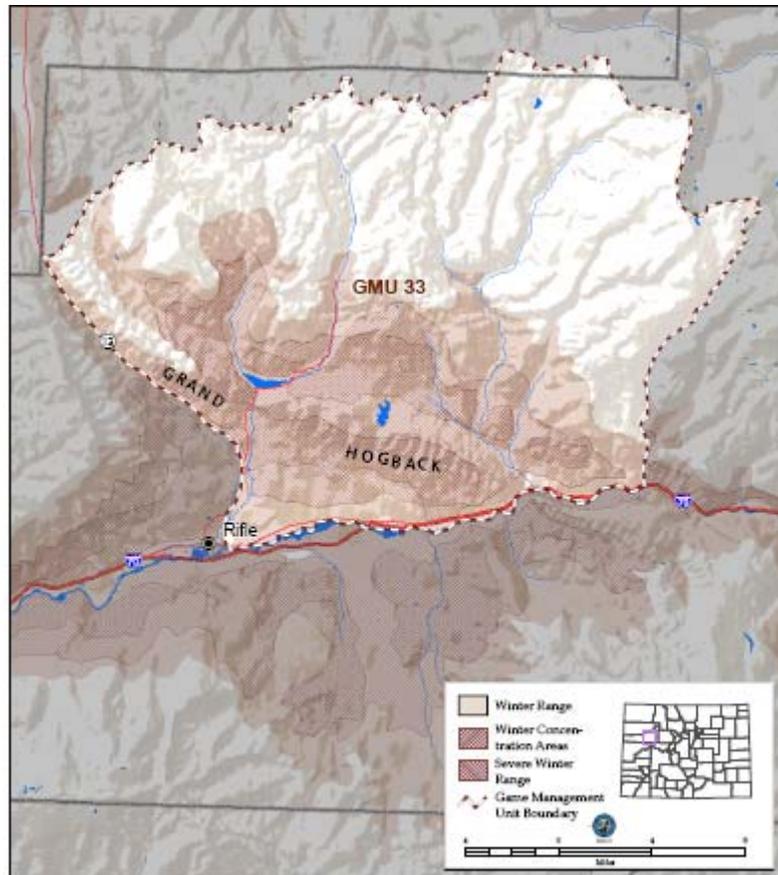
Winter range is often considered to be more important to deer than summer range because it is generally more limited due to weather conditions. The CDOW characterizes winter range into winter range, winter concentration areas, and severe winter range. They are defined as:

Winter Range: that part of the range where 90% of the animals are located during average winters.

Winter Concentration Area: the part of the range where densities are at least 200% greater than the surrounding winter range in average winters.

Severe Winter Range: that part of the range where 90% of the animals are located during the two worst winters in 10 years as determined by the maximum annual snow pack and minimum temperatures.

Due to heavy accumulations of snow at higher elevations, deer are forced to winter at lower elevations. There are approximately 200 square miles of winter range in DAU D - 42. Important winter ranges for deer include Horse Mountain, Cedar Mountain, West Rifle Creek, and the lower portions of the Elk Creeks (Figure 12). Favorable snow depths, slope, aspect, and winter temperatures make these areas suitable for wintering big game. During severe winters deer are forced to winter at even lower elevations where snow levels are usually the least.



Location of Mule Deer DAU D-42 (GMU 33), West-central Colorado, showing Mule Deer Winter Range, Severe Winter Range, and Winter Concentration Areas.

Figure 12. Deer Winter Range in DAU D - 42.

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

Of the approximately 200 square miles of winter range in D - 42, 61% is on public lands and 39% is on private holdings. The majority of the winter ranges are found on BLM and private lands, with only about 1% of the winter range found on USFS lands. There are approximately 230 square miles of summer range in D - 42. Of this area, 11% is on private land and 89% is on public land. The majority of deer summer range on public land is managed by the USFS.

Habitat Condition and Capability

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

Overall, the habitat condition and capability within this DAU is good. The available habitat is generally in good condition and public and private land managers are working to improve this habitat. Although the quality of habitat is good, the direct loss of this habitat is a major concern.

A primary issue for deer is the decline of winter range throughout the DAU. The reasons for this decline are many and varied. Pinon-juniper encroachment into former sagelands has decreased the amount of winter range available. Mature pinon-juniper stands provide little food for deer and large, uninterrupted pinon-juniper woodlands have limited value for deer except as thermal and escape cover. The value of pinon-juniper woodlands to deer can be improved by creating mosaic openings to create more forage and diversity. In addition to pinon-juniper encroachment, a lack of recruitment into sagebrush has created single age-class stands of older plants that provide far less nutrition and forage to wintering big game animals.

Noxious weed invasion is also of major concern regarding the habitat condition in D - 42. Weeds such as houndstongue, cheatgrass, knapweed, and thistle degrade the habitat and provide little forage for wildlife.

As total habitat disappears, habitat improvement projects on public and private land are improving conditions in remaining areas throughout D-42.

▪ Browse Conditions

Throughout D - 42, browse conditions are fair to good and generally improving, particularly in recent years with better precipitation. There is a lack of young, vigorous, nutritious browse throughout the DAU, primarily due to a lack of fire. Higher elevations are generally in better shape than lower elevations, primarily due to more moisture.

Several issues were identified during this process relating to browse conditions in D - 42. Snowberry encroachment and lack of regeneration in aspen stands has become a concern in recent years. It is not known why aspen recruitment is low, but drought is probably a major cause. Recent studies have suggested that some form of aspen-specific pest may also be playing a role. Serviceberry, mountain mahogany, and other mountain shrubs are also being out-competed by snowberry in some areas, and there is currently low recruitment of these species into mountain shrub communities in some areas. Despite some site specific issues, the overall browse conditions at high elevations in this DAU are good.

Lower elevations browse conditions are not as good. Oak brush has been hit hard in recent years by drought and late frosts. Although multiple age-class stands improve forage availability, thermal and escape cover is lost in the process. Sagebrush throughout the DAU on winter ranges is found in single age-class stands, with little age or size diversity and low vigor. There is significant pinon-juniper encroachment into sagebrush, which is adversely impacting available winter ranges.

There have been some habitat treatments in recent years to improve browse and range conditions in DAU D - 42. The White River National Forest has ongoing habitat improvement projects within winter and transitional ranges through the Rifle Burn Block Program.

- **Range Conditions**

Range conditions vary widely within D - 42. There are some site-specific issues across the DAU, but most rangelands are in fair to good condition. Higher moisture levels in recent years have dramatically improved the range conditions and available forage.

The primary issue impacting range quality in DAU D - 42 is the invasion of noxious weeds at lower elevations, particularly cheatgrass, Canada and musk thistle, annual wheatgrass, and Russian knapweed. Cheatgrass is very common on lower-elevation rangeland in D - 42 and is a predominant species on much of elk and deer winter range. This invasion exacerbates the damage caused by high-impact disturbance from activities such as oil and gas development and historic grazing practices.

Higher elevation rangeland is in much better condition and provides significant high quality forage to wildlife, particularly elk. High elevation areas on the top of the Flat Tops have high grass and forb diversity with good native vegetation component.

The high quality range conditions at high elevations are due primarily to higher moisture in recent years, and, to a lesser degree, to decreased livestock grazing in some areas. It is likely that livestock grazing is less of a negative impact to wildlife forage than is the invasion of cheatgrass, particularly on winter range.

- **Fire and Vegetative Succession**

Fire is an integral and necessary component of habitat health and regeneration. Over 100 years of fire suppression has allowed woody species to continue to mature and become denser and less productive. In addition, fire suppression has allowed fuels to build up to the point that when infrequent fires do occur they are much more intense and destructive. Deer show a strong preference for burned areas and seek the nutritious new growth that occurs after fire. Burned areas are generally considered to be beneficial for deer.

There have been some recent fires in DAU D - 42, both prescribed and wildland. Prescribed burns on Cedar Mountain and Elk Park show much higher productivity and diversity, improving winter range conditions by creating multiple age structures and opening up dense stands of woodlands and oak brush. Despite the benefits of wildland fires, there is the drawback that disturbance increases the possibility of noxious weed invasion, particularly of cheatgrass.

- **Public Lands vs. Private Lands**

Overall, there is very little difference in habitat condition between public and private lands in D - 42. The primary differences are seen in forage availability in dry land vs. irrigated ranges, with irrigated lands providing much greater forage amounts, plant diversity, and vigor. Noxious weed invasion is also frequently lower on private than public lands. These private lands provide valuable winter range to deer in D - 42.

Conflicts

- **The Habitat Partnership Program and Its Role in the DAU Plan.**

Colorado's Habitat Partnership Program (HPP) was initiated in 1989 to help address the problems private landowners and federal land management agencies have with big game animals. The program is designed to assist in resolving forage and fence problems, directly and with local input. A committee of local landowners, sportsmen and federal agency personnel is established to ensure appropriate public involvement in identifying range management problems and recommending solutions to these problems. Five percent of the total deer and elk license revenues produced from the DAU are available to the committee for habitat improvement work and other management programs to alleviate conflicts.

Another significant portion of each committee's involvement in local big game management is participation in the DAU planning process. They ensure that private land habitat issues are considered in setting the DAU objectives and that conflict areas are identified and solution strategies are appropriate.

The committee develops a 5-year Big Game Distribution Management Plan. This plan identifies locations and seasons of big game concentrations, which the landowner or land manager considers to be conflict areas. For each conflict area identified, the plan includes a strategy by which the CDOW and the landowner/land manager agree to eliminate or reduce the conflict.

The Lower Colorado River HPP committee was established in 1993 to work cooperatively with landowners and land management agencies in D - 42 to minimize and mitigate damage by deer in the area.

- **Deer Damage to Agricultural Crops**

The State of Colorado is liable for compensating landowners for documented damage to commercial agricultural products, livestock forage, and fences by deer and other big game provided the landowner allows reasonable hunting access. DAU D - 42 has traditionally seen little damage from deer to agricultural crops; in the last 7 years, there has been only one deer damage claim. Deer damage to agricultural crops is probably stable.

- **Deer Competition with Domestic Livestock**

There is very little competition with domestic livestock for deer forage within the DAU. These types of competition may increase as human activity spreads out from population centers and more heavily impacts traditional winter and summer ranges. It is difficult to mitigate for this type of damage, particularly as available habitat decreases due to many human disturbance.

- **Elk Competition with Mule Deer**

Although a causal relationship has never been concretely established, state-wide mule deer declines have coincided with increasing numbers of elk. Several studies in the western U.S. have shown that mule deer and elk have only moderate dietary overlap except during periods of food shortage such as during severe winters. Elk generally prefer to graze on grass, sedges, and forbs during much of the year; while deer tend to prefer forbs, young grasses, and new leader growth during the growing season, and select browse during the winter. Thus, except during severe winters, dietary overlap is probably minimal.

The elk in the overlapping DAU (E-6) are a slowly decreasing population. There is some concern that the elk herd has negatively impacted the deer herd through direct competition for spatial and forage resources. It is likely that within DAU D - 42 there is some competition between elk and mule deer, particularly for the limited resources available on winter ranges. Although this competition may negatively impact the mule deer in D-42, population declines within the DAU are probably more directly related to habitat fragmentation, drought, decadent vegetation structure, and increased human activity than simply increased elk numbers.

ISSUES

Issue Solicitation Process

The most important aspect of the DAU planning process is obtaining input from all segments of the affected local populations, including the USFS, BLM, HPP committee, and interested public. A meeting was held in December, 2006 to solicit input from local land management agencies.

In an effort to solicit information from the interested public, the CDOW held an open public meeting in Rifle during December of 2006 to gather recommendations on the goals and objectives of the DAU plan. At this meeting, current management objectives and possible alternatives were presented. Input was requested, in the form of an optional questionnaire (APPENDIX F: PUBLIC QUESTIONNAIRE), from participants at the time of the meeting regarding any issues or concerns. Concerns and comments and the questionnaire responses have been incorporated into this plan. A comprehensive analysis of these comments, along with text of written comments, is available in APPENDIX E: COMMENTS FROM PUBLIC STAKEHOLDERS WITH QUESTIONNAIRE ANALYSIS.

The Board of County Commissioners (BOCC) from Garfield Counties was also requested to provide input on the draft management plans and was invited to the local public meetings. At the time of this writing no comments had been received from the BOCC. If any input is received, it will be incorporated into this plan at a later date.

A meeting was held with the Lower Colorado River HPP committee in January 2007 to provide them with information about the DAU planning process and the management alternatives being considered.

Issue Identification

▪ Issues and Concerns: CDOW

The main concern identified by CDOW personnel was declining winter range quality and quantity. The impacts of energy development on deer, particularly on winter ranges, was also of major concern.

Declining Habitat Quality, Particularly on Winter Range

Habitat quality is the single most important factor affecting deer populations throughout Colorado, particularly on winter ranges. High quality habitat allows for a higher sustainable population, maintains the herd in better condition, and provides for better reproduction and survival. Winter range is generally the limiting factor determining deer numbers, as it is less available than other ranges.

In many areas in DAU D - 42, the range and browse conditions are of significant concern. Although browse conditions are generally good, degraded areas are

more common on transitional ranges, especially oak brush; and on winter ranges, including sagebrush. Generally, the habitat quality decline has been caused by a lack of rejuvenation, over – utilization, and invasive weeds.

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

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

Ultimately, the decline in habitat quality is the primary issue affecting the deer in this DAU. Although there are many different causes of this degradation, it is vital to the health of these herds that habitat quality be improved.

Housing/Ex-Urban Development

The DAU has had substantial development in areas that were once part of deer winter range, particularly along the I-70 corridor. Ranches have been subdivided and habitat quality is significantly reduced by fragmentation. Development has combined to reduce the amount of useable winter range. This includes direct loss of habitat and effective loss of surrounding habitat due to harassment from people and pets. Rifle, Silt and New Castle have all, in the last decade, seen rapid development of housing in areas that once were deer winter range. This development has combined to reduce the amount of useable winter range for deer and puts added pressure on remaining lands.

Natural Gas and Oil Development

Natural gas and oil development within this DAU is not likely to be a major impact other than the small area south of the Hogback. However, adjacent DAU's are seeing exponential increases in oil and gas development. These activities will also affect D-42 through activities such as increased recreation and motor vehicle traffic.

These impacts result in dispersal and distribution conflicts when deer concentrate in areas that have not been impacted by oil and gas development. These distribution problems may then result in increased conflicts, increased pressure on valuable habitats, and, most likely, in declines in overall herd health and sustainability.

Low fawn: doe ratios

Fawn: doe ratios have averaged around 41 fawns: 100 does since 1993. It is unknown why fawn numbers are so low, but it is possible that a density dependent situation is occurring and is contributing to slow population recovery. High fawn mortality is often a characteristic of an over population of deer and poor habitat quality.

Increasing the number of mature bucks

There is considerable interest within the CDOW to improve the quality of bucks in D - 42, while still maintaining hunter opportunity. Most CDOW personnel expressed a desire to increase the number of mature bucks and maintain a buck: doe ratio closer to 30 bucks: 100 does.

▪ Issues and Concerns: BLM

A meeting was held in an effort to involve land management agencies in the DAU planning process. The White River Field Office of the Bureau of Land Management was invited to the meeting and requested to provide comments regarding deer management in D - 42. Following this meeting, the White River Field Office provided a letter outlining concerns and preferred alternatives.

The BLM supported maintaining the population size at current levels and increasing buck: doe ratios to 30 - 35 bucks: 100 does.

The Bureau of Land Management personnel expressed concerns regarding decreasing winter range resulting primarily from residential development. Winter range quality decline due to fire suppression, late seral stage sagebrush and pinyon-juniper encroachment was also identified as a concern. Based on habitat quality and capacity, the BLM recommended maintaining the population size at current levels.

Full text of BLM comments can be read in APPENDIX C: TEXT OF COMMENTS FROM BUREAU OF LAND MANAGEMENT, GLENWOOD SPRINGS FIELD OFFICE

▪ Issues and Concerns: USFS

United States Forest Service lands within D - 42 are managed by the White River National Forest. The following is a summary of recommendations from local personnel of the United States Forest Service. Full text of their comments can be read in APPENDIX B: TEXT OF COMMENTS FROM THE WHITE RIVER NATIONAL FOREST.

The White River National Forest personnel recommended that the population size objective range be maintained at the status quo, with a new objective range of 7,700 – 9,400 deer. The WRNF expressed a preference 30 bucks: 100 does. The WRNF cited very few deer damage complaints and current and future

projects to maintain and improve deer winter and transition ranges in support of their recommendation.

- **Issues and Concerns: Lower Colorado River Habitat Partnership Project Committee**

The Lower Colorado River Habitat Partnership Project Committee works with landowners and landowning agencies in DAU D - 42 to minimize and mitigate for damage by deer to agricultural crops. During this planning process, a presentation was made to the Lower Colorado River HPP Committee to advise the Committee of the DAU management plan revision. At that time, the DOW requested that the Committee provide comments about deer management in D-42 and to select preferred population size and composition objectives. The full text of these comments is included in APPENDIX D: TEXT OF COMMENTS FROM LOWER COLORADO RIVER HPP COMMITTEE.

The Lower Colorado River HPP Committee recommended managing for 7,700 - 9,400 deer and for improving the buck/ doe ratio to 30 – 35 bucks: 100 does. There was no concern expressed by the HPP committee for significant agricultural damage by deer, but there interest in improving buck ratios and quality.

- **Issues and Concerns: Public Stakeholders**

Several issues were identified as important to public stakeholders during this process. The majority of individuals contacted expressed concerns relating to habitat loss and decline, particularly on winter ranges and improving buck quality and quantity.

Analysis of the questionnaire that was distributed at the public meetings and made available on the internet indicates that the majority of respondents wanted the deer population size to remain at current levels or increase and the number and quality of bucks to increase. Half of all respondents indicated that it was most important to hunt every year, a quarter of respondents responded that it was most important to harvest a trophy deer.

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

- **Issues and Concerns: County Commissioners**

The Garfield County Board of County Commissioners was contacted as part of this DAU planning process. They were provided with a background of the planning process and the alternatives that were presented at the public meetings. No comments were received from Garfield County BOCC.

maintained during the regular seasons. There would be no new significant fiscal impacts under this alternative.

Alternative 3: 8,700-10,400 deer:

This alternative would increase the population size of this herd from current levels. Game damage problems, such as damage to crops, would likely increase. The CDOW's Habitat Partnership Program (HPP) would become increasingly important for addressing fence and forage problems related to deer on both public and private lands. More licenses would be available over the long-term, so income to the CDOW and local communities would likely increase.

▪ **Sex Ratio Objective Alternatives**

Sex ratio objectives determine the number of bucks: 100 does. This characteristic most directly impacts the number of antlered licenses issued and the quality and quantity of bucks that are available to be harvested. Since the population size objective is established separately, the total number of deer would remain the same. Therefore there would not be any effect on the habitat, the need for habitat improvement projects or game damage. There might be a minimal increase in moneys available for HPP due to increased licenses.

Alternative 1: 20-25 bucks: 100 does:

This alternative would maintain the objective number of bucks in this herd at current levels. To attain this objective, buck harvest would necessarily increase, as buck: doe ratios have averaged 30 bucks: 100 does. There would be an increase in license sales and money spent in local communities to some extent.

Alternative 2: 25-30 bucks: 100 does:

This alternative would increase the buck objective in this herd from the current objective of 20 bucks: 100 does. There would not, however, be a significant change in management because buck: doe ratios are already averaging in this range. This alternative would maintain the current sex ratio, while changing the objective.

Alternative 3: 30-35 bucks: 100 does:

This alternative would increase the overall number of bucks within the population from an average of 30 bucks: 100 does. This alternative would require a change in management to achieve the objective. The CDOW would ease hunting pressure on the male segment of the population by decreasing licenses available in the 2nd and 3rd seasons in particular. The number of trophy bucks available for harvest would increase but total harvest and recreation days would decrease. There would be minimal impact on doe harvest.

COW PREFERRED POPULATION SIZE AND COMPOSITION ALTERNATIVES

Preferred Population Size Objective Alternative

7,700 – 9,400 deer

Preferred Population Composition Objective Alternative

30 – 35 bucks: 100 does

Preferred Alternative Justification

▪ Population Objective:

The D - 42 deer population has been stable to slightly increasing in recent years, following many years of low population numbers. The population is near the objective of 8,400 animals that was set through the DAU planning process in 1994.

Public surveys, land management agency input, and HPP committee participation all indicate a general agreement that the deer herd is at or near desirable and sustainable levels. There is little to no support for a decrease of the population size and little support for increasing the herd.

Land management agencies indicated overall satisfaction with the D - 42 deer herd population. Although some conflict exists, range and browse conditions are generally good or improving.

Deer hunting in this unit is popular and the demand appears to be increasing steadily, at least partially as a result of improved buck quality. Limited antlered licenses provide opportunity to approximately deer hunters annually. There is significant demand among sportsmen to continue providing significant deer hunting opportunity in the Rifle Creek area, while at the same time improving buck quality.

Due to the majority of internal, agency, and public input received, the CDOW recommends maintaining the deer herd in DAU D - 42 at current levels and setting a population size objective of 7,700 – 9,400 deer.

- **Composition Objective:**

The CDOW recommendation is to increase the composition objective to 30 - 35 bucks: 100 does. There is significant demand for both high hunter opportunity and for improved buck quality. However, there was significantly more demand for more mature bucks, both internally and externally. Due to the majority of internal, agency and public input received, the CDOW recommends increasing the buck: doe ratio to 30 – 35 bucks: 100 does

APPENDIX A: DEER POPULATION DYNAMICS

Numerous studies of biological populations of such species as bacteria, mice, rabbits, and white-tailed deer have shown that animal populations grow in a mathematical relationship that biologists refer to as a “sigmoid growth curve” or “S” curve (Figure 13). There are three distinct phases to this cycle. The first phase occurs while the population level is still very low and is characterized by a slow growth rate and a high mortality or death rate (see A in Figure 13). This occurs because the populations may have too few animals and the loss of even a few of them to predation or accidents can significantly affect the population. In other words, there appears to be some truth to the old saying “There’s strength in numbers”.

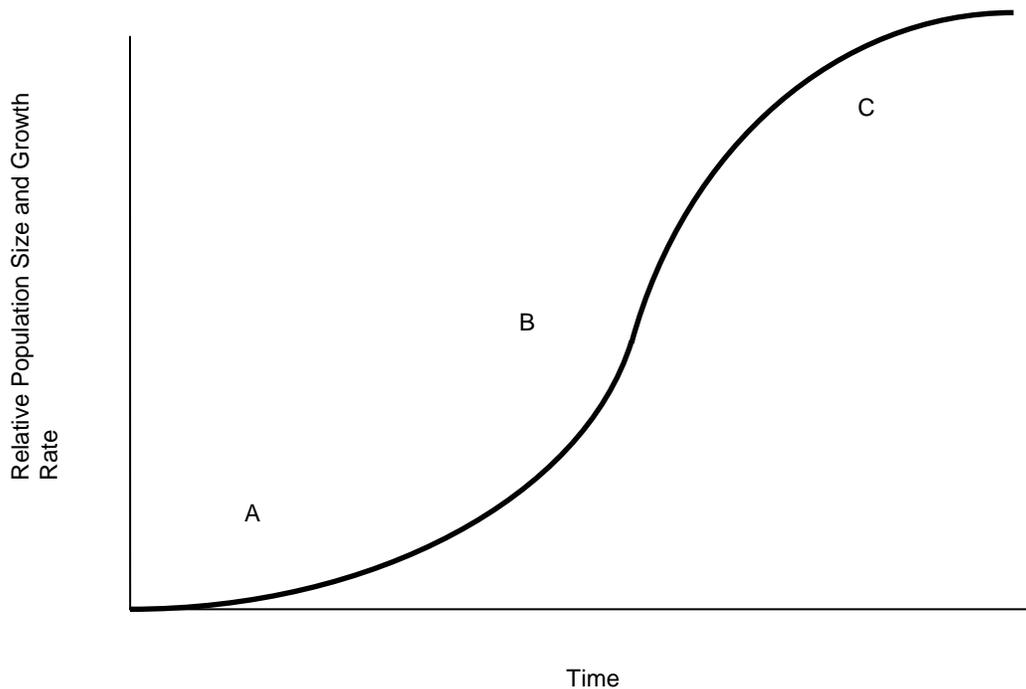


Figure 13. Sigmoid Growth Curve.

The second phase occurs when the population number or density is at a moderate level. This phase is characterized by a very high reproductive and survival rate (see B in Figure 13). During this phase, food, cover, water, and

space (habitat) is optimal and abundant. These high reproductive rates during this phase can be seen in white-tail deer, when does may breed successfully at 6 months of age and produce a live fawn on their first birthday. Older does have been known to produce 3-4 fawns that were very robust and healthy. Survival rates of all deer (bucks, does, and fawns) are at maximum rates during this phase.

The third and final phase occurs when the habitat becomes too crowded. The quality and quantity of food, water, cover, and space become scarce and poor due to the competition with other members of the population. This phase is characterized by decreased reproduction and survival (see C in Figure 13). For example, white-tail deer fawns can no longer find enough food to grow to a critical minimum weight to reproduce; adult does will only produce 1-3 fawns, and survival of all deer (bucks, does, and fawns) decreases. During severe winters, large die-offs can occur due to overcrowding and lack of forage. The first to die in these situations are fawns, followed by bucks, finally followed by adult does. Thus, severe winters affect future buck: doe and fawn: doe ratios by favoring more does in the populations. Additionally, since buck's antlers are dependent upon nutrition, antlers are stunted during this phase.

If the population continues to grow, it will eventually reach the maximum carrying capacity, or "K" (Figure 14). At this point, the population reaches a dynamic equilibrium with the habitat. The number of births each year equals the number of deaths, therefore, maintaining the population at this level would not allow for any "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. Thus, another old expression, "the bigger they are the harder they fall" may be appropriate here. A recent example of such a population die-off occurred in the relatively unharmed Northern Yellowstone elk herd during the severe winter of 1988-89. This winter followed the forest fires of 1988 that raged in the National Park.

What does all this mean to the management of Colorado's big game herds such as deer and elk? It means that if we attempt to manage for healthy big game herds, we should attempt to hold the populations at about the middle of the "sigmoid growth curve." Biologists call this "MSY" or "maximum sustained yield." At this level, which is exactly half the maximum population size or "K", the population will display the maximum production, survival and available surplus animals for hunter harvest (Figure 14). Also, at this level, range condition and trend should be good to excellent and stable, respectively. Game damage problems should not be significant and economic return to the local and state economy should be at the maximum. This population level should produce a "win - win" situation to balance sportsmen and private landowner concerns.

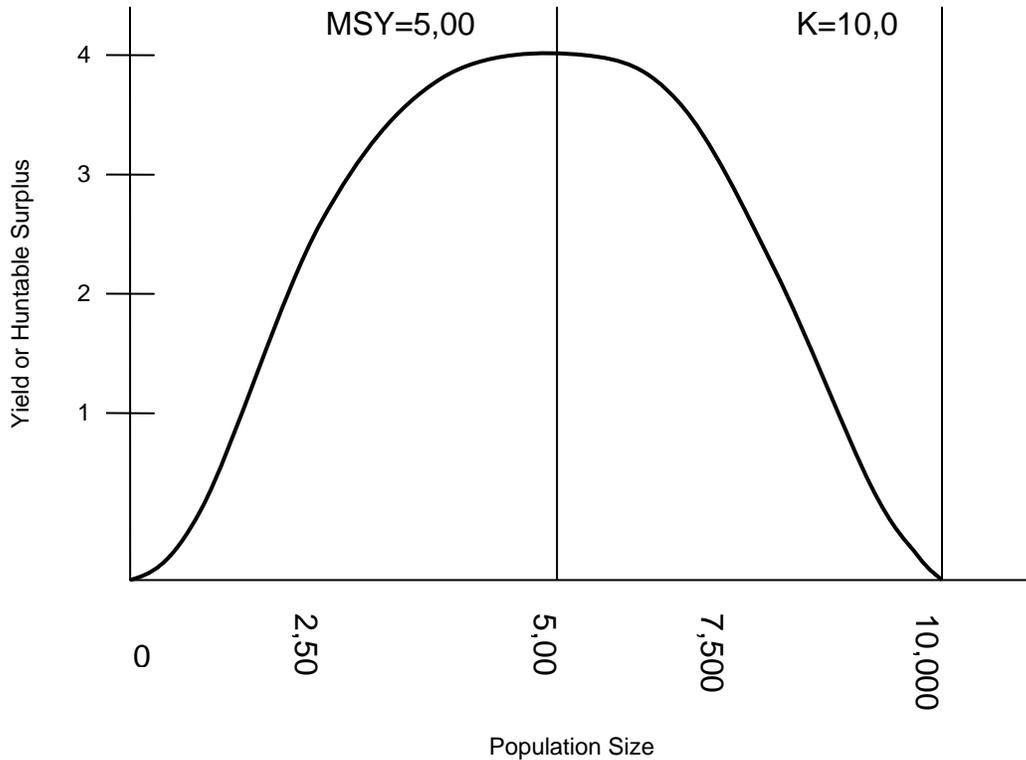


Figure 14. Maximum Sustained Yield and Maximum Carrying Capacity.

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

APPENDIX B: TEXT OF COMMENTS FROM THE WHITE RIVER NATIONAL FOREST



United States
Department of
Agriculture

Forest
Service

White River
National
Forest

Rifle Ranger District
0094 County Road 244
Rifle, CO 81650
(970) 625-2371
FAX (970) 625-2532

File Code: 2610
Date: May 24, 2007

Stephanie Duckett
Terrestrial Biologist
Colorado Division of Wildlife
711 Independent Ave,
Grand Junction, CO 81505

Dear Stephanie,

Thank you for the opportunity to comment on the 10 year revision of the management plan for deer in the Rifle Creek area (Game Management Unit 33). This GMU is bounded by I-70 on the south, Highway 13 on the west, roughly the Rifle Ranger District Boundary on the north, and follows Canyon Creek on the east. On the Rifle Ranger District, there is approximately 6000 acres of deer winter range in this GMU, as mapped by the Colorado Division of Wildlife. This winter range habitat is located between the West Elk Creek and East Elk Creek at the lower elevations of the district.

Our preferred alternative recommendation for Mule Deer in GMU 33 is to continue managing the mule deer population at the current objective level of between 7,700-9,400 deer, which is Alternative 2 in the information you mailed us in a letter dated March 30, 2007. Fawn production and fawn:doe ratios seem to be doing well at the present time. We also recommend Alternative 2 for a buck:doe ratio of between 25 and 30 bucks per 100 does, which is a slight increase from the current ratio of 20 bucks per 100 does. We believe a buck:doe ratio closure to 30 bucks per 100 does would be ideal.

There seems to be little resource impacts associated with the mule deer herd in GMU 33 on Forest Service lands, and the District is not aware of complaints on private land bordering the forest. The Forest Service continues with habitat improvement projects within winter range and transitional range through the Rifle Burn Block Program. Hunting contributes significantly to the economies of the local community of Rifle. It continues to be a significant use on the National Forest in this area.

Thanks again for the opportunity to make recommendations on this GMU revision. If you have any questions, please contact Natasha Goedert of my staff at (970) 878-6006.

Sincerely,

MICHAEL R. HERTH
District Ranger



Caring for the Land and Serving People

Printed on Recycled Paper



APPENDIX C: TEXT OF COMMENTS FROM BUREAU OF LAND MANAGEMENT, GLENWOOD SPRINGS FIELD OFFICE



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Glenwood Springs Field Office
50629 Highways 6 and 24
Glenwood Springs, Colorado 81601



IF REPLYING BY FAX:

6808

00-140

January 23, 2007

Mr. Ron Velarde
Regional Supervisor
Colorado Division of Wildlife
711 Independent Ave.
Grand Junction, Colorado 81505

Subject: D-42 DAW Plan (Rifle Creek)

Dear Ron,

We appreciate the opportunity to review and provide input on the D-42 DAW plan currently being revised by your agency. As public land managers we recognize the many challenges of maintaining viable, productive big game herds given current land patterns and uses. In summary, the CDOW is evaluating three population size alternatives and four sex ratio alternatives to manage mule deer in D-42.

The BLM generally supports the population alternative that reflects the current population of mule deer in the Rifle Creek area (7,700 - 9,400 animals). This is based primarily on the current and projected availability and condition of important habitats. As in many areas, winter habitat may be the limiting factor regarding mule deer population size in the Rifle Creek area. Big game winter range habitat is continuing to decrease as private land habitats are developed or converted to non-habitat. This adds to management conflicts and in some cases results in increased use by wintering big game on adjacent public lands. A formal Land Health Assessment was conducted in the western portion of D-42 (Rifle Creek Watershed) in 2002. Overall, the watershed was providing healthy, productive habitat for mule deer. In some areas, sagebrush stands were in late seral stage with poor productivity and showed signs of juniper encroachment. Browse species in some spots were moderately to severely hedged and exhibited low vigor. Poor condition of these sagebrush stands can be attributed to a lack of fire and not to mule deer numbers. Habitat improvement projects, designed to mimic natural disturbances, are currently being conducted in DAW-42 to improve winter habitat conditions. With proper management, including habitat improvement projects, winter habitat in DAW-42 should be able to support the current population of mule deer. However, an increase in the mule deer population may degrade winter habitats on public lands.

In general, population objectives are more relevant to BLM than sex ratios, as BLM is primarily responsible for managing habitat. However, as numerous people enjoy hunting on BLM managed lands, providing the public with a quality hunting experience is also important. The BLM generally supports the composition alternatives that reflect the current buck to doe ratio in the Rifle Creek area. Either the 25-30 bucks per 100 does alternative or the 30 - 35 bucks per 100 does alternative would generally maintain the current composition of 32 bucks per 100 does.

We appreciate the opportunity to review and provide input on this plan, and we look forward to continued cooperation regarding the management of big game habitats located on public lands administered by the Glenwood Springs Field Office. If you have any questions, please contact Deoa Ausmus in our office at (970) 947-2819.

Sincerely,



Jamie Connell
Field Manager

Attachments:

Rifle Creek Land Health Assessment Report

cc: Dean Riggs, Area 7 Supervisor
Stephanie Duckett, Terrestrial Biologist

APPENDIX D: TEXT OF COMMENTS FROM LOWER COLORADO RIVER HPP COMMITTEE



COLORADO DIVISION OF WILDLIFE HABITAT PARTNERSHIP PROGRAM

Lower Colorado River Habitat Partnership Program
PO Box 1452
Rifle, CO 81650

Stephanie Duckett
711 Independent Ave.
Grand Junction, CO 81505

January 15, 2007

RE: Deer DAU Management Plan – DAU D-42 (Unit 33)

Dear Stephanie,

Thank you for coming and presenting the Deer DAU Management Plan to Lower Colorado HPP. We appreciate you taking the time to involve us.

After reviewing and discussing the information that was presented, it is the consensus of the Lower Colorado HPP Committee that for the upcoming DAU Plan, we support for the population, the status quo option, keeping the overall numbers the same. For the Buck/Doe ratio the committee supports Alternative 3, increasing the buck/doe ratio to 30-35 bucks per 100 does.

If you have any further questions, please feel free to contact me by phone at (970) 260-0147 or by e-mail at danielles@willowwisp.net, I will be happy to help. Thank you.

Sincerely,

Danielle Smith

Danielle Smith
Lower CO River HPP,
Committee Administrative Assistant

APPENDIX E: COMMENTS FROM PUBLIC STAKEHOLDERS WITH QUESTIONNAIRE ANALYSIS

Questionnaire Answers

▪ BACKGROUND INFORMATION

1. Are you a resident of Colorado?

A total of 17 respondents answered this question. Thirteen respondents are residents, four are not residents.

2. Do you live in GMU 33?

A total of 17 respondents answered the question. Six respondents live in GMU 33, eleven do not.

If yes, how many years? _____

Four respondents answered the question. The median length of residence in GMU 33 was 7.5 years.

3. Do you own or lease property in GMU 33?

A total of 17 respondents answered the question. Six respondents own or lease property in GMU 33, eleven do not.

If yes, how many years? _____

Four respondents answered the question. The median length of property ownership or lease in GMU 33 was 7.5 years.

4. What groups represent your interests in deer management in GMU 33?
(Check all that apply)

____ Rancher/Farmer/Landowner

____ Business Owner

____ Guide/Outfitter

____ Hunter/Sportsperson

____ Environmentalist/Conservationist

____ Other, please explain _____

Seventeen respondents answered the question. Four identified themselves as rancher/farmer/landowner; three as business owner; one as guide/outfitter; seventeen as hunter/sportsperson; four as environmental/conservation, and one as other (photographer).

If you checked more than one response above, write the letter corresponding to the interest group which best represents your opinions _____

Sixteen respondents answered the question. One identified primarily with rancher/farmer/landowners, fourteen primarily identified with hunter/sportspersons, and one identified primarily with environmental/conservationists.

▪ **DEER MANAGEMENT**

1. How would you like the deer population in GMU 33 to change?

- Decrease
- Stay the same
- Increase
- Don't know

Sixteen respondents answered the question. Nine want the population to stay the same, six want the population to increase, and one didn't know.

2. The population is currently above the population objective. How would you like the deer population objective in GMU 33 to change?

- Decrease
- Stay the same
- Increase
- Don't know

Seventeen respondents answered the question. One wanted the population size objective to decrease, six wanted it to stay the same, nine wanted it to increase, and one didn't know.

3. How would you like the number of buck deer in GMU 33 to change, if at all?

- Decrease
- Stay the same
- Increase
- Don't know

Seventeen respondents answered the question. Six want the number of buck deer to stay the same and eleven want it to increase.

4. The objective for buck deer is currently 20 bucks: 100 does. How would you like the objective for the number of buck deer in GMU 33 to change, if at all?

- Decrease
- Stay the same
- Increase
- Don't know

Seventeen respondents answered the question. Four want the buck objective to stay the same and fourteen want it to increase.

▪ **DEER HUNTING**

1. Have you ever hunted deer in GMU 33?

- Yes No

Seventeen respondents answered the question. Twelve had hunted deer in GMU 33 and five had not hunted in GMU 33.

If yes, how many years? _____

Ten respondents answered the question. The median years hunted in GMU 33 was five.

2. Overall, to what extent have you felt crowded by other hunters while deer hunting in GMU 33? (Circle ONE)

- | | | | |
|-----------|------------|----------|------------|
| Extremely | Moderately | Slightly | Not at all |
| Crowded | Crowded | Crowded | Crowded |

Fourteen respondents answered the question. Four had felt extremely crowded, seven had felt moderately crowded, one had felt slightly crowded, and two had felt not at all crowded.

3. Please rate the quality of deer hunting opportunities available in GMU 33? (Circle ONE)

- Poor Fair Good Very Good Excellent No Opinion

Fifteen respondents answered the question. One rated the hunting as poor, five rated it as fair, four rated it as good, and five rated it as very good.

4. Which ONE factor is the MOST important to you when deer hunting in GMU 33? (Check ONE)

- Not seeing other hunters
- Obtaining game meat
- Harvesting a trophy deer
- Opportunity to hunt every year

Sixteen respondents answered the question. Two chose not seeing other hunters, two chose obtaining game meat, four chose harvesting a trophy deer, and eight chose the opportunity to hunt every year as the most important factor in hunting deer in GMU 33.

▪ **PEOPLE AND DEER**

1. Please indicate how concerned you are about each of the following in GMU 33.

(Circle one number for each item).

	No Concern			Very Concerned	
a) Deer/Vehicle collisions.....	1	2	3	4	5
b) Economic losses to ranchers/farmers from deer damage to rangeland, crops, or fences.....	1	2	3	4	5
c) Deer competing with livestock for forage.....	1	2	3	4	5
d) Damage to homeowners' trees, shrubs, and gardens caused by deer.....	1	2	3	4	5
e) Loss of deer habitat due to increased human population & development.....	1	2	3	4	5
f) Revenue deer hunting provides local business...	1	2	3	4	5

2. Have you been personally affected by any of the concerns listed in Question 1 in GMU 33?

_____ Yes

_____ No

Sixteen respondents answered the question. Eight had been personally affected by the concerns listed in Question 1, and eight had not been personally affected.

If yes, circle one: A B C D E F G H I or J

Six respondents answered the question. One had been affected by economic losses to ranchers/farmers; five had been affected by habitat loss.

3. How do you personally feel about deer GMU 33? (Check ONE)

_____ I do not enjoy the presence of deer in GMU 33, AND regard them as a nuisance.

_____ I enjoy the presence of deer in GMU 33, BUT worry about the problems they may cause.

_____ I enjoy the presence of deer in GMU 33 AND do not worry about the

problems they may cause.

_____ I have no particular feelings about deer in GMU 33.

Seventeen respondents answered the question. One indicated that they enjoy the presence of deer and worry about problems and the remaining sixteen said that they enjoy the presence of deer and do not worry about the problems they cause.

Text of Written Public Comment

▪ Questionnaire 1:

I have hunted and fished GMU 33 off & on since 1981 and truthfully have seen a decline of quality deer hunting on a steep decline. Last time we hunted their [sic] was 2002, one of the worst [sic] as far as harvesting game I was ever on. Lots of deer on private prop., very few on public [sic] land and very few quality bucks. Their [sic] used to be some good quality bucks in the 80's and early 90's. I can only say if their habitat [sic] is taken away, then everything that was will be no more, for I live in California and I saw it happen here. Always remember that the deer and elk were here first.

▪ Questionnaire 2:

Habitat loss, especially winter ranges is a serious problem in this unit, both from a housing/urban sprawl standpoint and a lack of habitat management (ie. pinyon/juniper invasion, fire suppression, noxious weeds, etc.).

I believe the CDOW should be pushing for some cooperative habitat management efforts on a broad scale with BLM, USFS, private landowners, and maximize collective efforts on key areas of this unit by use of HPP, GO-CO, MDF, and RMEF funding mechanisms.

▪ Questionnaire 4:

I have hunted deer in unit 33 for over 50 years and have seen deer dwindle in number every year since I started hunting as a young man. In my unger [sic] days I can remember seeing hundreds of deer every day of the hunt. If you see a couple small bucks a season you feel [sic] lucky. I remember [sic] going up Piante [sic] Creek and seeing deer nose to tail as far as you could see heading west toward the Utah Border. Not just a few but hundreds.

Chuck Nielsen PO Box 195, Silt, Colo.

PS: For the Fish and Game Management of Colorado I would have to give a [sic] F all they think about is the money and not the deer.

▪ Questionnaire 5:

Since I was a baby I've been in this area going to Meeker and remember [sic] vast herds of deer, few people. Now it's [sic] the opposite. This is critical habitat loss,

access to the river with I-70, homes, etc. Access to area where I can hunt is limited. Where you can access, everyone's just around the next tree-very crowded. Deer crowd onto the "private" tracts where [sic] no hunting is posted.

The DOW is more concerned about the Pension Fund and loss of revenue than the wildlife-1981 Budget meeting discussing [illegible] Lic res 4 pt. restrictions income/loss stats-I was there. I'm arthritically handicapped when it comes to hunting; I'm night blind so hunting is limited to easy terrain and day light only. So where can I go? So far few places.

I-70 is the biggest threat to wintering deer, elk and moose; this is most likely your main concern in wanting to reduce the deer herds. You need more deer, elk and cattle to keep weeds and brush down for fire control in my opinion and [illegible] people. Judy Nielsen, Former licensed guide in Colo. 970/379-3260.

▪ **Questionnaire 7:**

I hunted in 33 for several years. When I was there, most of the deer were concentrated on private land. There were very few deer on public land and lots of hunters trying to shoot them. Landowner access programs might be a good idea in this unit. There are only a few hunters who are going to pay the \$5000 price of a deer hunt, and at that price they are not going to kill a significant number of animals. A combination doe tag and private land access fee at around \$75 will get the deer numbers down in 33.

▪ **Questionnaire 8:**

I would like to see the population increased, but managed in a way too, transport a numbers of head; buck and doe too different part of Colorado to populate and do allow other hunter to harvest, white tail or black in different parts of Colorado, to keep down the number of hunter from building up, just in one or two hunting units. But to keep in mine [sic] the management of deer and elk is good for the population for meat for the hungry, and the best forchant [sic]. Nothing follows----

▪ **Questionnaire 10:**

Based on personal observations I believe the number of adult bucks is down some from last year. I also believe the doe population is down. The last 2-3 years the number of fawns surviving to fall is way down for resident deer on Silt Mesa. Twin fawns are common in June but by September only single fawns or no fawns are seen with adult does. Don't have a reason.

▪ **Questionnaire 14:**

Leave this unit alone. It is a quality.

▪ **Questionnaire 15:**

As a non-resident hunter, I tremendously enjoy the opportunities for buck harvest in GMU 33. I would like to see the buck: doe ratio objective increased to 30 -35 bucks: 100 does to allow more bucks to survive to maturity and increase the quality of bucks harvested. As a wildlife biologist employed by another state agency, I can definitely see the need to maintain a deer population at/or below it's [sic] carrying capacity. However, if the browse resource (particularly winter range) can support the current population, I would like to see it maintained.

▪ **Questionnaire 16:**

In the area I elk hunt w/in unit 33, there are very few deer. I have yet to see a mature buck in this area. There are many more deer along the river (E. Elk Crk.) but this is primarily private property. I am not overly concerned about not seeing deer because I elk hunt only in this area. However, it appears that this area should hold many more deer than I see. Because Unit 33 is above objective the question arises, yet again, if the biological mgmt of a species can occur over such a large area. Since my area of specialties is aquatic macroinvertebrates, I do not see how the mgmt can be done as it is, but the CDOW has been doing a good job overall. You're the experts, do what is right, not what respondents say.

Text of Comments from the Colorado Mule Deer Association



Rifle / Glenwood Springs Chapter
PO Box 1149
Rifle, CO 81650

January 28, 2007

Dean Riggs
Area Wildlife Manager
711 Independent Avenue
Grand Junction, CO 81505

Dear Dean:

I have talked to our membership about Unit 33 and received the following recommendations for Unit 33. We support Alternative 2 for the population size. For the sex ratio objective we support Alternative 3.

The consensus for this unit is that the population is down over last year and so are the number of mature bucks. My place lies in the middle of a migration route and I saw a lot fewer deer moving through this fall compared to previous years. I also had only one mature buck in the area this fall.

I drive transport for Westcare Ambulance and 9-11 at night. As such I keep track of road kills as an indication of deer crossing areas. This is important when running code. There seems to be quite a lot fewer road kills this fall and winter compared to the last 2 or 3 winters. That could change but to date its less. Again, don't know why.

Thanks for the opportunity to comment.

Sincerely,

A handwritten signature in cursive script that reads "Bob Elderkin".

Bob Elderkin
1513 Road 250
Silt, CO 81652

APPENDIX F: PUBLIC QUESTIONNAIRE

OPPORTUNITY FOR PUBLIC COMMENT



DEER MANAGEMENT

In the Rifle Creek Area
COLORADO

Data Analysis Unit D-42
(Game Management Unit 33)

The Colorado Division of Wildlife is interested in your opinions about deer management in the Rifle Creek 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 deer in Game Management Unit 33.

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

December 2006

Dear Interested Citizen:

The Colorado Division of Wildlife (CDOW) is interested in your opinions about deer in the Rifle Creek Area, Game Management Unit (GMU) 33. Wildlife managers have begun the process of updating the deer 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 Rifle Creek DAU includes only GMU 33. The purpose of the DAU plan is to determine: 1) how many deer the DAU should support, and 2) what sex ratio (number of bucks per 100 does) 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 deer 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 deer herd objectives (population size and sex ratio) in the Rifle Creek 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 Grand Junction Service Center by
January 31, 2007.

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

TO RETURN THIS QUESTIONNAIRE:
Please hand-deliver or mail to:
Colorado Division of Wildlife
Attn: Terrestrial Biologist
711 Independent Ave.
Grand Junction, CO 81505

First, please examine the map and written description of the areas designated as Data Analysis Unit D-42, Game Management Unit 33 located in West-Central Colorado, then go to Question 1.



Location of Mule Deer DAUD-42 (GMU 33), West-central Colorado.

Description of DAU D-42:

It is bounded on the north by the Colorado River - White River divide, on the east by Canyon Creek, on the south by the Colorado River, and on the west by Colorado Hwy. 13.

▪ **BACKGROUND INFORMATION**

1. Are you a resident of Colorado?
2. Do you live in GMU 33?
3. Do you own or lease property in GMU 33?

If yes, how many years? _____

4. What groups represent your interests in deer management in GMU 33?
(Check all that apply)

____ Rancher/Farmer/Landowner

____ Business Owner

____ Guide/Outfitter

____ Hunter/Sportsperson

____ Environmentalist/Conservationist

____ Other, please explain _____

5. If you checked more than one response above, write the letter corresponding to the interest group which best represents your opinions _____

▪ **DEER MANAGEMENT**

1. How would you like the deer population in GMU 33 to change?

____ Decrease

____ Stay the same

____ Increase

____ Don't know

2. The population is currently above the population objective. How would you like the deer population objective in GMU 33 to change?

____ Decrease

____ Stay the same

____ Increase

____ Don't know

3. How would you like the number of buck deer in GMU 33 to change, if at all?

____ Decrease

____ Stay the same

____ Increase

_____ Don't know

4. The objective for buck deer is currently 20 bucks: 100 does. How would you like the objective for the number of buck deer in GMU 33 to change, if at all?

_____ Decrease

_____ Stay the same

_____ Increase

_____ Don't know

▪ **DEER HUNTING**

1. Have you ever hunted deer in GMU 33?
 _____ Yes _____ No If yes, how many years? _____

2. Overall, to what extent have you felt crowded by other hunters while deer hunting in GMU 33? (Circle ONE)

Extremely Moderately Slightly Not at all
 Crowded Crowded Crowded Crowded

3. Please rate the quality of deer hunting opportunities available in GMU 33? (Circle ONE)

Poor Fair Good Very Good Excellent No Opinion

4. Which ONE factor is the MOST important to you when deer hunting in GMU 33? (Check ONE)

- _____ Not seeing other hunters
- _____ Obtaining game meat
- _____ Harvesting a trophy deer
- _____ Opportunity to hunt every year

▪ **PEOPLE AND DEER**

1. Please indicate how concerned you are about each of the following in GMU 33.

(Circle one number for each item).

No Concern Very Concerned

- a) Deer/Vehicle collisions.....1 2 3 4 5
- b) Economic losses to ranchers/farmers from deer damage to rangeland, crops, or fences.....1 2 3 4 5
- c) Deer competing with livestock for forage.....1 2 3 4 5
- d) Damage to homeowners' trees, shrubs, and gardens caused by deer.....1 2 3 4 5
- e) Loss of deer habitat due to increased human

population & development.....1 2 3 4
5

f) Revenue deer hunting provides local business...1 2 3 4 5

2. Have you been personally affected by any of the concerns listed in Question 1 in GMU 33?

_____ Yes If yes, circle one: A B C D E F G H I or J

_____ No

3. How do you personally feel about deer GMU 33? (Check ONE)

_____ I do not enjoy the presence of deer in GMU 33, AND regard them as a nuisance.

_____ I enjoy the presence of deer in GMU 33, BUT worry about the problems they may cause.

_____ I enjoy the presence of deer in GMU 33 AND do not worry about the problems they may cause.

_____ I have no particular feelings about deer in GMU 33.

