BIJOU CREEK DEER HERD MANAGEMENT PLAN

DATA ANALYSIS UNIT D-49

Game Management Units 104, 105 & 106

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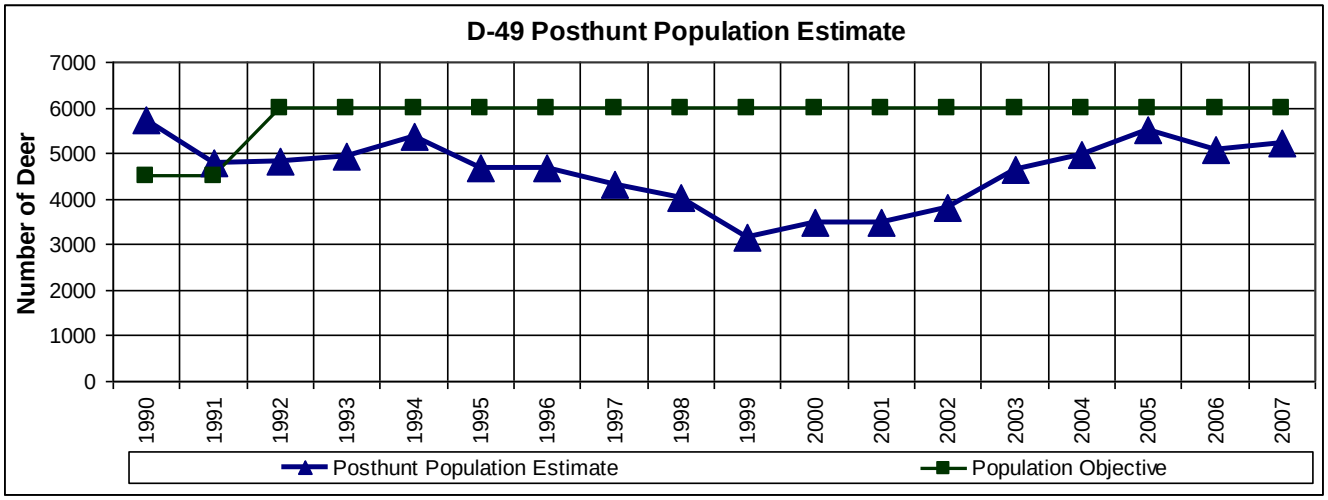
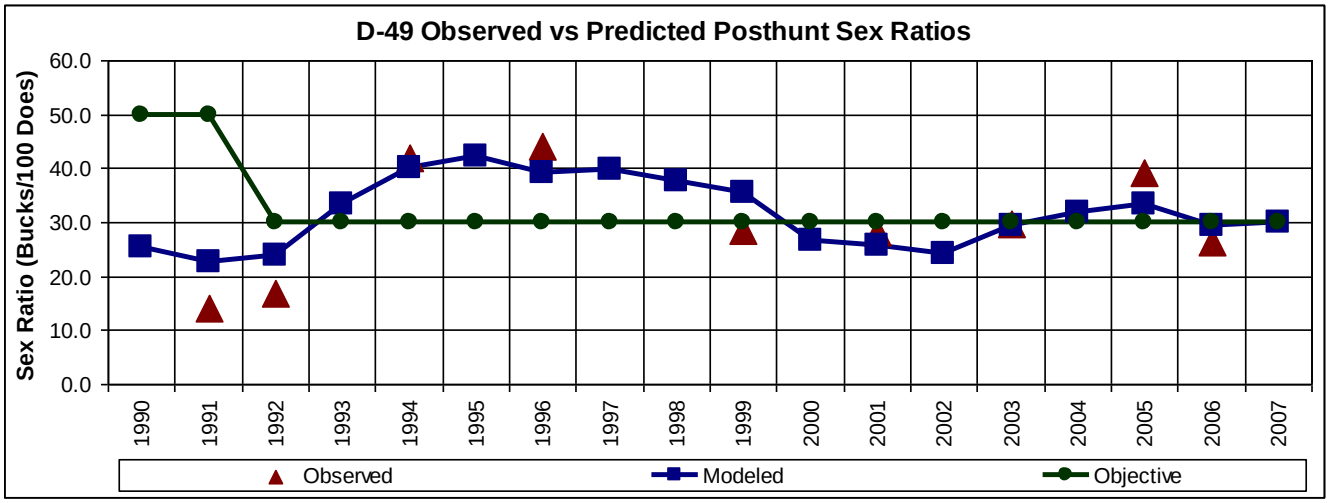
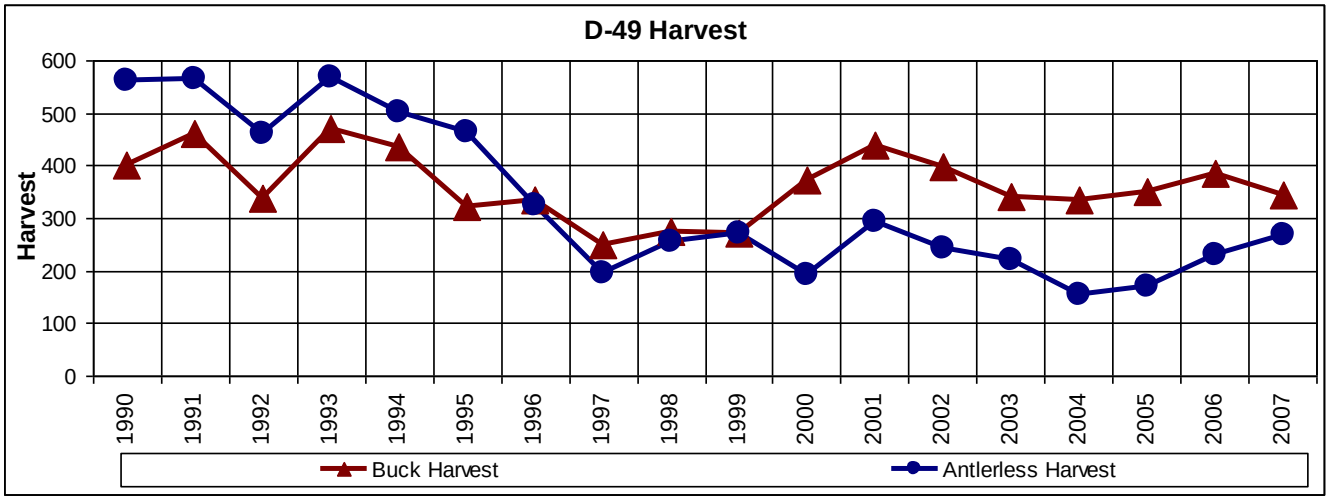
DAU D-49 (Bijou Creek)
Executive Summary

GMUs: 104, 105, & 106
Land Ownership: 99% private, 1% public
Posthunt population: **Previous Objective** 6,000 **2007 estimate** 5,250
Current Objective 5,500-6,500
Posthunt sex ratio: **Previous Objective** 30 **2006 observed** 26 **2007 modeled** 30
Current Objective 30-35







Background

D-49 contains Game Management Units (GMU) 104, 105 and 106. It covers parts of Adams, Arapahoe, Douglas, and Elbert Counties east of Interstate 25. The habitat is primarily shortgrass prairie with cottonwood-willow riparian habitat in water drainages, some patches of ponderosa pine forest, and areas of cultivated croplands. Much of the western part of the DAU (Data Analysis Unit) is urban, including the cities of Denver and Aurora, with many suburban/ exurban developments. Nearly all of the land in this area is privately owned and there is no hunting allowed on public lands.

The current population and sex ratio objectives are 6,000 deer and 30 bucks:100 does. The 2007 post-hunt population projection is about 5,250 deer.

The 2007 post-hunt herd composition projection is 30 bucks: 100 does: 64 fawns. The 2006 observed sex ratio was 26 bucks:100 does, although this may be lower than the actual ratio due to unusually early antler drop related to severe winter conditions. The 2005 observed ratio was considerably higher at 39 bucks:100 does. The average observed sex ratio for 2001-2006 was 31 bucks:100 does.

Significant Issues

Urban encroachment is the primary impediment to managing the deer population in this DAU. Most development has occurred in the eastern half of GMU 104, but there have also been impacts in GMU 105. Residential development has resulted in increasing densities of deer where there is adequate habitat, but little or no hunting harvest. This is problematic because an increase in hunting licenses is more likely to result in harvest from rural parts of the unit than on small acreages where deer populations are most dense.

Some game damage occurs, usually in the winter on haystacks. Several public comments stated that there are too many deer and that they are causing damage, although there have been few game damage payments. Game damage issues have often been handled using special game damage seasons to help disperse deer from problem areas.

Landowners expressed dissatisfaction with their ability to draw rifle buck deer licenses.

Management Alternatives

Population objective:

Alternative 1= 4,200-4,800 deer.

Alternative 1 represents a decrease of about 15% from the current population and 25% from the previous objective. Under this alternative there would initially be more opportunity to hunt, particularly for antlerless deer, but after the population reduction, hunting opportunity would decrease in order to stabilize the lower deer population.

Alternative 2= 5,500-6,500 deer.

Alternative 2 contains the previous population objective and represents little change in deer numbers, which will be within the range of the population objective by 2008. Under this alternative, the total number of deer in the population would increase slightly to about 12% over the current population estimate. There would be little change in hunting opportunity.

Alternative 3= 6,800-7,600 deer.

Alternative 3 represents an increase of about 37% from the current deer population estimate and 20% from the previous objective. Initially there would be a reduction in hunting opportunity to allow the population to grow, but eventually hunting opportunity would increase to greater than the current level. This alternative may lead to more game damage.

Herd composition objective:

Alternative 1= 20-25 bucks:100 does.

Alternative 1 represents a decrease of 5-10 bucks:100 does from the current estimate and previous objective. Under this alternative, it would be easier to draw a buck hunting license, but there would be fewer bucks available to harvest and also fewer large-antlered bucks.

Alternative 2= 30-35 bucks:100 does.

Alternative 2 represents no change from the current estimate and previous objective. Under this alternative, there would likely be a slight increase in quality or quantity of buck hunting given that the current sex ratio estimates are at the low end of the objective range. The number of preference points needed to draw a license would not change.

Alternative 3= 40-45 bucks: 100 does.

Alternative 3 represents an increase of 10-15 bucks:100 does from the previous objective. Under this alternative, there would be more and larger-antlered bucks available for harvest, but hunting opportunity would decrease. The number of preference points required to draw a license would probably increase, but harvest success would also be expected to increase.

Preferred Alternatives

Population objective:

The preferred alternative for the deer population in D-49 is 5,500-6,500 deer. The majority of public comments supported maintaining or increasing deer numbers. The current population is slightly under this number, but expected to be within the objective in 2008. Hunting opportunity would not change, and management strategies would remain similar to current strategies. If it becomes necessary to harvest more antlerless deer in order to keep the population from going over objective, additional harvest strategies will be explored. The CDOW will continue to manage game damage situations by issuing special management licenses where needed.

Herd composition objective:

The preferred alternative for herd composition is Alternative 2, 30-35 bucks:100 does which includes the previous objective at the low end of the range. Public comments supported an increase in the sex ratio more representative of Alternative 3. However, the CDOW believes that Alternative 2 allows for some increase in the sex ratio and provides quality buck hunting while maintaining a level of hunting opportunity that is acceptable to both landowners and public hunters.

This plan was approved by the Colorado Wildlife Commission on November 12, 2009

BIJOU CREEK DEER HERD MANAGEMENT PLAN
Data Analysis Unit D-49
Game Management Units 104, 105, & 106

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INTRODUCTION AND PURPOSE

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

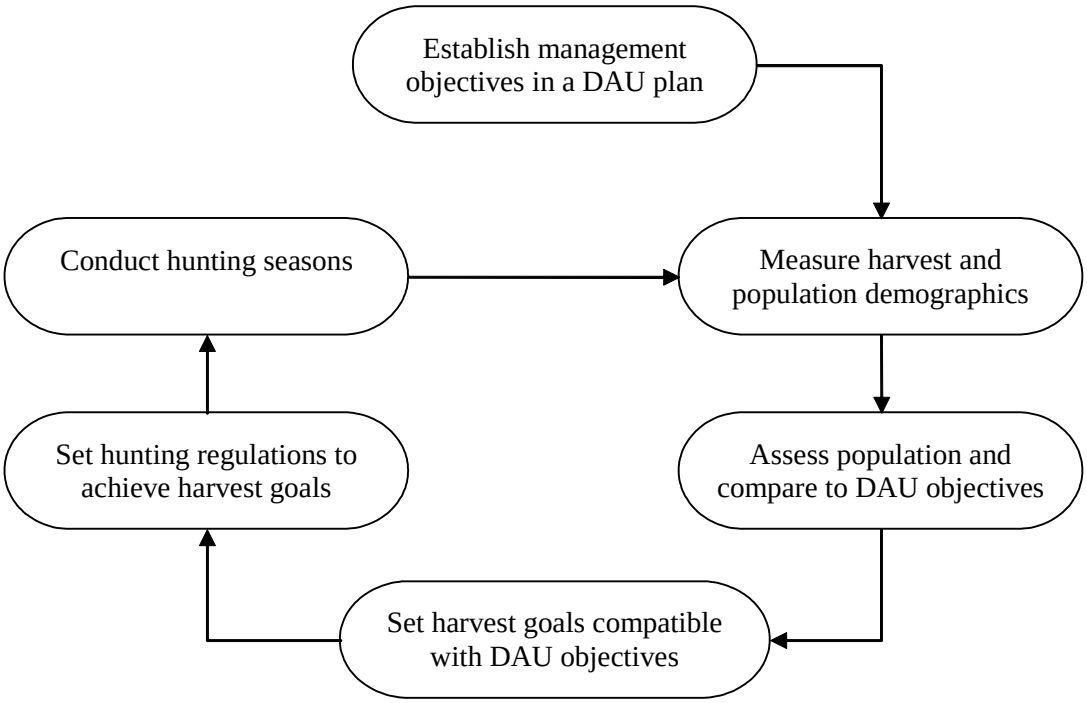

Figure 1. Colorado's big game management by objective process

In this approach, big game populations are managed to achieve population objectives established for a Data Analysis Unit (DAU). A DAU is the geographic area that includes the year-round range of a big game herd. A DAU includes the area where a majority of the animals in a herd is born, lives, and dies. Boundaries are delineated to minimize interchange of animals between adjacent DAUs. A DAU may be divided into several game management units (GMUs) in order to distribute hunters and harvest.

Management decisions within a DAU are based on a DAU management plan. The primary purpose of the plan is to establish population and herd composition (i.e., the number of males per 100 females) objectives. The DAU plan also describes the strategies and techniques that will be used to reach these objectives. During the DAU planning process, public input is solicited and collected by way of questionnaire, public meetings and comments to the CWC. The intentions of the CDOW are integrated with the concerns and ideas of various stakeholders including hunters, guides and outfitters, private landowners, local chambers of commerce and the general public. In preparing a DAU plan, agency personnel attempt to balance the biological capabilities of the herd and its habitat with the public's demand for wildlife recreational

opportunities. DAU plans are approved by the CWC and are reviewed and updated every 10 years.

The DAU plan then serves as the basis for the annual herd management cycle. In this cycle, the size and composition of the herd is assessed and compared to the objectives defined in the DAU plan. Hunting seasons are then set and licenses are allocated to either maintain or move toward the objectives.

DESCRIPTION OF DAU D-49

Location

The Bijou Creek deer DAU is located in east central Colorado, in portions of Adams, Arapahoe, Douglas, Elbert, Lincoln, and Washington counties. The DAU is comprised of GMUs 104, 105, and 106 (Figure 2). It includes the eastern part of the Denver metro area and the towns of Castle Rock, Kiowa, Elizabeth, Parker, Bennett, Strasburg, Simla, Deer Trail, and Agate.

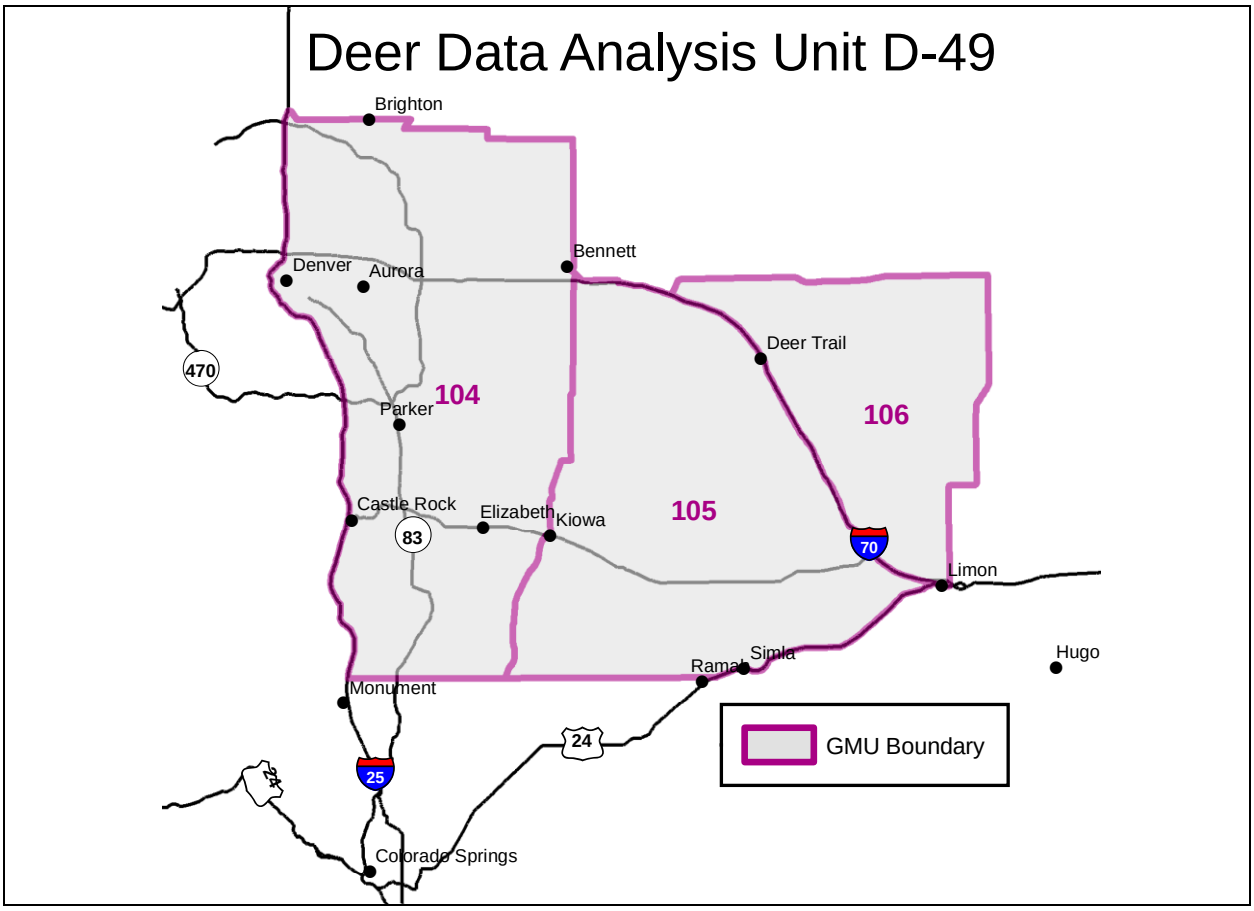

Figure 2. Location of DAU D-49, GMUs 104, 105, and 106

Topography

D-49 is on the high plains of eastern Colorado. Most of the topography is flat to gently rolling prairie. There are some moderately steep areas including rocky buttes with steep cliffs in the southwest corner of GMU 104. Along the eastern boundary of GMU 106 there is an area of steep dry ravines and rock outcroppings which supports both deciduous and conifer, trees and

shrubs. There are low rolling hills throughout much of the rest of the unit. The South Platte River runs through the northeast corner of the DAU in the northern part of GMU 104, and it is the only major river in the unit. Most other waterways are intermittent, but several creeks that feed into the South Platte River have important influences on topography, habitat and land use patterns in the area.

Habitat Composition

There are several habitat types in the Bijou Creek DAU, including urban, shortgrass prairie, ponderosa pine woodland, cottonwood-willow riparian, dryland agricultural, and irrigated agricultural. In the eastern part of the DAU, the most common habitat type is shortgrass prairie interspersed with ephemeral streams supporting cottonwood-willow riparian habitat. There is a small amount of shrub habitat type, particularly in the southwest portion. The cottonwood-willow riparian habitat is especially important for deer at all times of the year. In addition to providing food, water, cover, and thermal protection, riparian areas provide movement corridors for both mule and white-tailed deer.

Land Use

Much of GMU 104 is densely populated metropolitan land, especially the central-western part of the unit which includes Denver and associated suburbs. The unit also includes lower density residential developments around Parker and Elizabeth. Portions of GMU 104 that are farther away from Denver are used for grazing or cropland. Land uses in GMUs 105 and 106 are primarily ranching including large pastures and cropland, although residential development has increased in parts of GMU 105. Recently wind energy projects have been proposed for parts of the DAU, particularly in GMU 106.

Climate

Climate is semi-arid, with average annual precipitation of approximately 14 to 18 inches per year (NRCS National Cartography and Geospatial Data Center, http://www.ncgc.nrcs.usda.gov/). Typically there are a few large snow events, mostly in the late winter or early spring. The snowiest months are March and April. A wide range of temperatures and conditions can be experienced during the winter. Warm sunny days are not uncommon, but severe winter storms can occur. Blizzards often have little impact on deer survival if warm sunny weather allows rapid snowmelt. However, if multiple storms and/or prolonged cold follow a storm, negative impacts on deer survival may occur.

Summers in this area tend to be hot and dry. Summer days are often hot, with daily high temperatures reaching the mid- to upper-90s. Daily monsoon rains as afternoon thundershowers are not unusual, but this pattern does not occur in all years. Seventy to eighty percent of annual total precipitation falls during the period of April through September (http:// climate.atmos.colostate.edu/climateofcolorado.shtml).

Deer Distribution

Deer in D-49 are concentrated in the cottonwood-willow riparian areas throughout GMUs 104 and 105. Unit 106 is primarily upland habitat, but East Bijou Creek and Middle Bijou Creek run through the northwest corner of the unit. Concentrations of deer are also found in GMU 106 among the ponderosa pine and juniper woodlands northwest of Limon, in ponderosa pine forests

in the southern part of GMUs 104 and 105, and near suburban or residential areas, particularly low-density developments like Parker and Elizabeth.

Most of the deer in upland habitat are mule deer, but a mix of mule deer and white-tailed deer inhabit some of the riparian areas. The proportion of mule deer and white-tailed deer varies geographically and temporally. In some drainages, white-tailed deer make up a high proportion of the deer present, while others contain few white-tailed deer. Big Sandy Creek, in the southern part of GMU 105, and the South Platte River in the northern part of GMU 104, have particularly high numbers of white-tailed deer, but the species also occupies other major drainages in the DAU. It is possible that the proportion of white-tailed deer to mule deer has increased in recent years, but this is not clear from survey data.

HERD MANAGEMENT HISTORY

Post-hunt Population Size

The post-hunt population objective for this DAU is currently 6,000 deer. The population was estimated to be 5,700 in 1990 and then declined to below 5,000 in 1991 where it remained relatively stable until 1997. Population estimates reached a low of about 3,100 in 1999. Reductions in license numbers then allowed the population to grow to about 5,500 by 2005. License numbers were increased in 2005 and 2006 in order to slow population growth and the population actually declined slightly as a result (Figure 3).

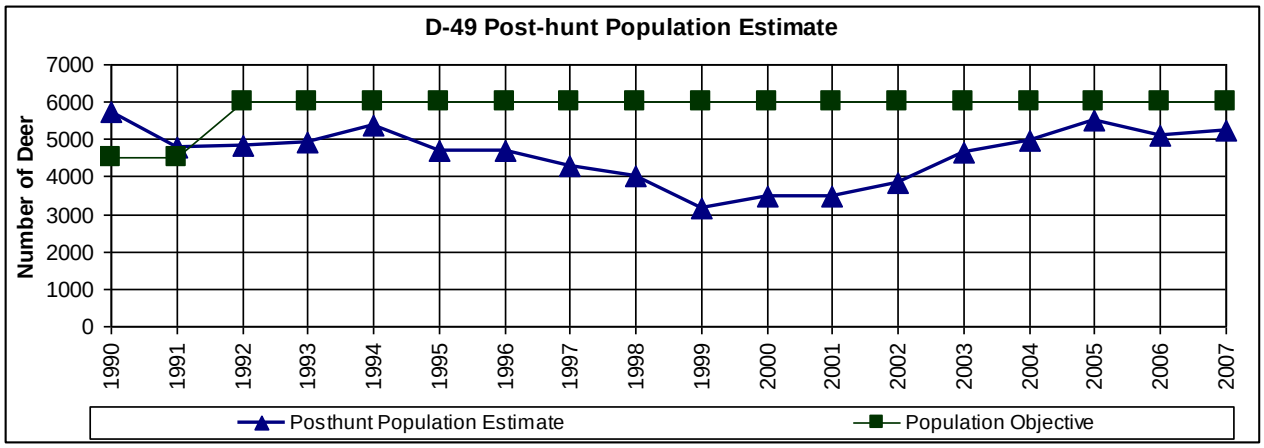

Figure 3. Post-hunt population in D-49

Estimating population numbers of free-ranging wildlife over large geographic areas is an inexact science. Numerous studies have been conducted in closed settings, with known numbers of animals available to be counted by surveyors and in all cases only a portion of the animals were actually counted. The CDOW recognizes that providing precise and accurate estimates of Colorado's wildlife populations is a difficult and challenging task. As is often true in other modeling or estimation attempts, population estimates are only as good as the data and techniques that were used to obtain them. As new techniques in estimation and modeling become validated, and as new data provide better estimates of population parameters, the CDOW will strive to integrate these changes into management strategies and protocols. It is important to note that any time population estimation or herd composition survey protocols are changed; these adjustments may result in significant changes in the parameter being measured. These changes typically will be a product of the technique used, not a real change in the parameter of interest.

Numbers presented in this document should be considered as estimates with variability, and therefore should be viewed over time and not as absolutes.

Post-hunt Herd Composition

Sex and age ratios are estimated by helicopter surveys, typically conducted every one or two years in December or early January. The post-hunt sex ratio objective is currently 30 bucks per 100 does. Observed sex ratios have been as low as 14 bucks:100 does in the early 1990s, when surveys were conducted at the end of January or early February. Antler drop on those later surveys may have biased sex ratios downward. Sex ratios have been as high as 44 bucks:100 does in 1996. The most recent observed ratios were 39 bucks:100 does in 2005 and 26 bucks:100 does in 2006 (Figure 4). However, the 2006 observed ratio is believed to be lower than the actual number of bucks in the population because several one-antlered bucks were observed during the survey. We assume that some bucks had also shed both antlers by the time we conducted the survey (on January 10, 2007). The cause of early antler shedding was likely related to the unusually severe weather that occurred that winter. Average observed sex ratios from 2001-2006 was 31 bucks:100 does.

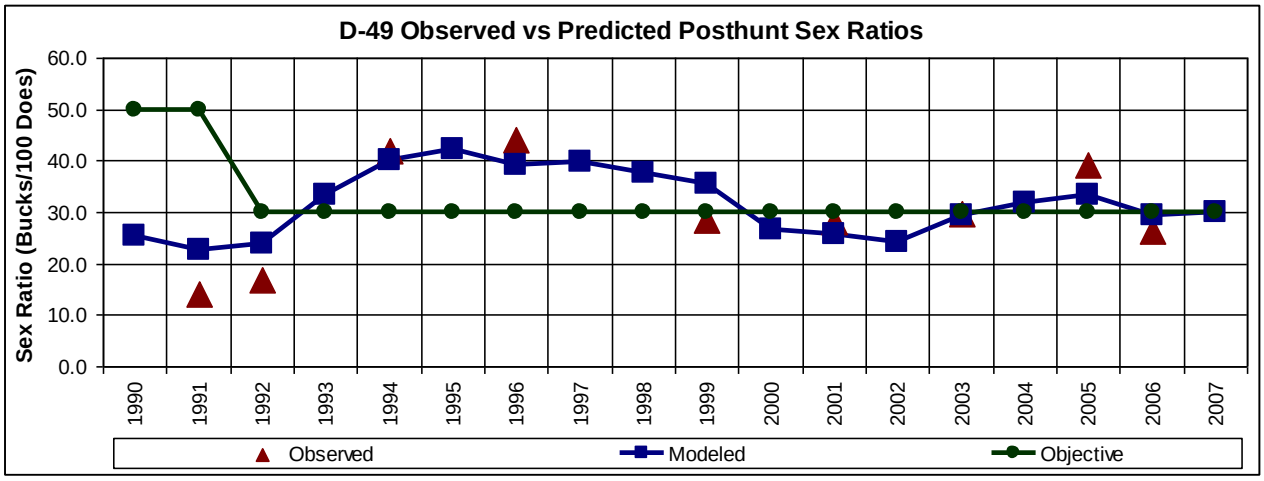

Figure 4. Post-hunt sex ratios in D-49

Observed fawn:doe ratios have varied from a high of over 80 fawns:100 does in 1996 to a low of just over 30 fawns:100 does in 1999 (Figure 5). Fawn recruitment has improved recently, as indicated by higher observed ratios in the last three surveys. Several public comments expressed concern that deer numbers would decline because of the severe weather in the winter of 2006-07, but the impacts on subsequent fawn recruitment remains to be seen. Several dead deer were found that year on or near haystacks where game damage was reported. The dead deer were all young of the year or yearlings, and had apparently starved to death. This suggests that higher than normal mortality occurred, but probably did not affect adult deer as much as younger deer. There were also reports of intentional feeding of deer in some areas but there was no official feeding program by the CDOW in this DAU.

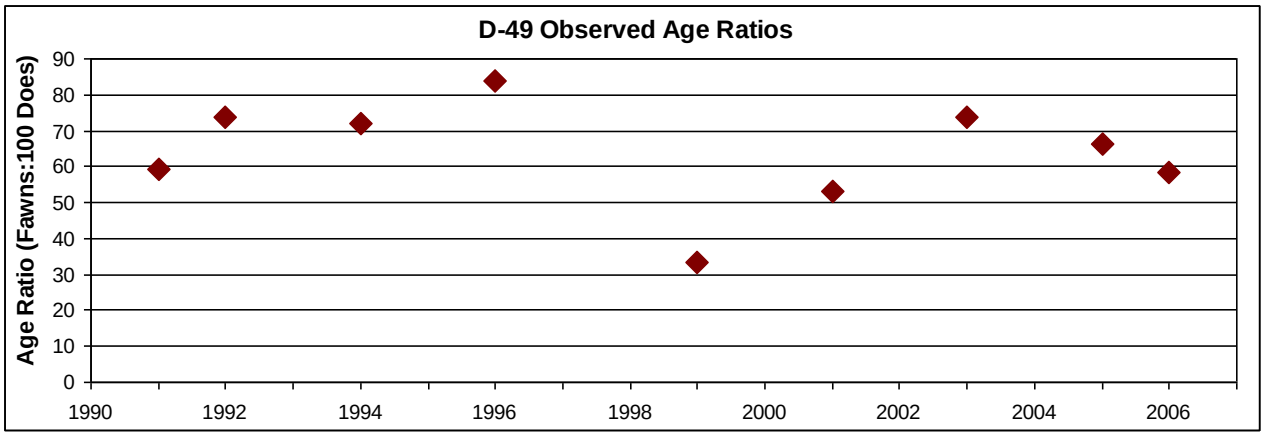

Figure 5. Post-hunt age ratios in D-49

There are concerns among landowners, hunters and CDOW staff about the impacts that white-tailed deer may have on mule deer. These concerns include competition and hybridization between the two species that could result in white-tailed deer displacing mule deer and even local extirpations of mule deer. However, displacement does not necessarily occur, and white-tailed and mule deer have been documented to occupy the same areas without one species displacing the other (Wood et al. 1989). However, mule deer's preference for open habitat and the escape behavior makes them more vulnerable to harvest with high-powered rifles than white-tailed deer. Because of increased vulnerability to harvest and preference of many hunters for mule deer, there is disproportionate hunting pressure on mule deer which could result in an increasing proportion of white-tailed deer.

The distribution of white-tailed deer has fluctuated over time in D-49. Landowners and wildlife officers have noticed that white-tailed deer have been present in large numbers in a particular area for several years, only to disappear from that area in later years. In other parts of the DAU, white-tailed deer have remained in the area for several years and appear to have increased in number. The distribution of and trends in numbers of white-tailed and mule deer will continue to be monitored during regular deer inventory methods.

Harvest

During the last 18 years, annual harvest has ranged from a high of over 1,000 deer in 1991 and 1993 to around 450 in 1997 and 2003 (Figure 6). During the last 10 years, harvest has averaged 580 deer and the most recent harvest in 2007 totaled 612 deer. Antlered harvest ranged from 471 bucks in 1993 to 250 bucks in 1997. Buck harvest over the past ten years has averaged 351, and the most recent harvest was 344. The highest antlerless harvest was over 560 deer in 1990, 1991 and 1993, and the lowest antlerless harvest was 154 in 2004. The ten-year average antlerless harvest was 230, and the most recent antlerless harvest was 268.

License numbers have been limited for rifle hunters since there has been an open season in D-49. In contrast, archery hunting licenses were unlimited in number prior to 1999, but have also been limited either-sex since 1999. In addition to CDOW limitations on license numbers available, hunter distribution and participation is also limited by access, as all hunting is by permission on private or State Land Board lands. Areas open to hunting will probably continue to decline with increasing housing developments on small acreages, especially in GMU 104.

Although landowners and lessees control hunting access, the deer population does respond to changes in license numbers. Therefore, it appears that hunters are able to gain access

to private property and use the licenses that are available. A large amount of land is leased for deer hunting and the DAU attracts buck deer hunters who are willing to pay for access to private land.

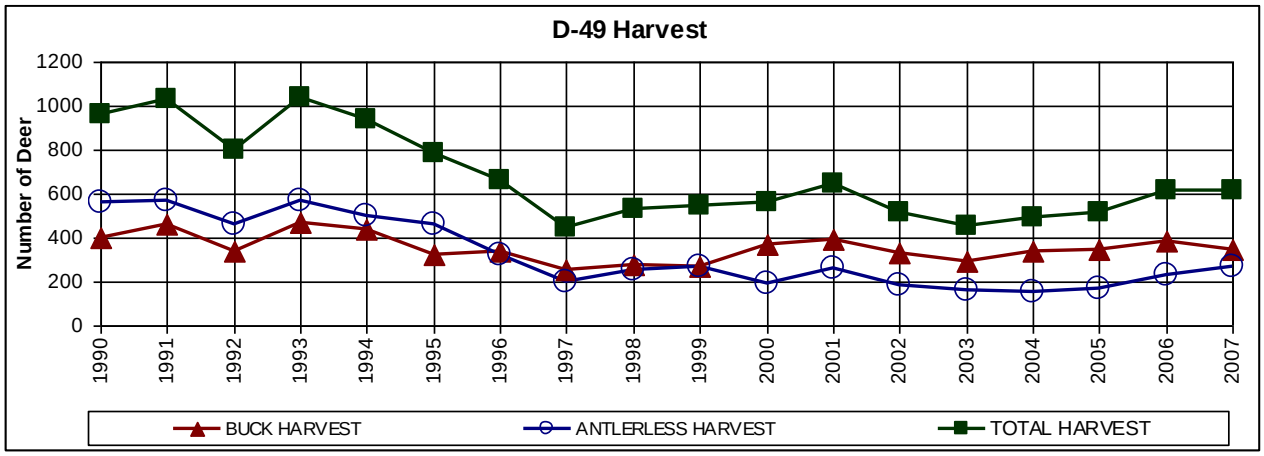

Figure 6. Deer harvest in DAU D-49

Hunters

D-49 is a popular unit because of the close proximity to major urban areas of the Front Range and the presence of mature bucks. The number of hunters has ranged from 1700 in 1994 to 954 in 2005 (Figure 7). Average hunting success was 48% over the past ten years. The average success for buck hunters is 47% over the past ten years (Figure 8).

Demand for rifle antlered licenses exceeds the supply, particularly in the late plains rifle season in GMUs 105 and 106, where it takes at least 2 preference points to draw a license. Prior to 2001, there was only one plains rifle season in D-49, however since 2001 there have been two rifle seasons: a regular and a late plains rifle season. Initially hunters could draw a late season license with one preference point and it is still possible to draw a late rifle buck license in GMU 104 with one preference point. However, at least two preference points have been required to draw a late rifle license in GMU 105 or 106 every year since 2002. Demand for the early plains rifle season and for muzzleloader season is not as high as for the late rifle season, but demand also exceeds supply, requiring at least one preference point in most cases to draw. In contrast to buck licenses, antlerless licenses can usually be drawn without preference points.

Either-sex archery licenses have been limited since 1999 and demand has been lower than the number of licenses available. The number of first-choice applicants for archery licenses in this DAU has been slightly lower than the number of licenses available in every year since 1999, so first-choice applicants draw and some applicants draw a license on a second choice (Figure 9).

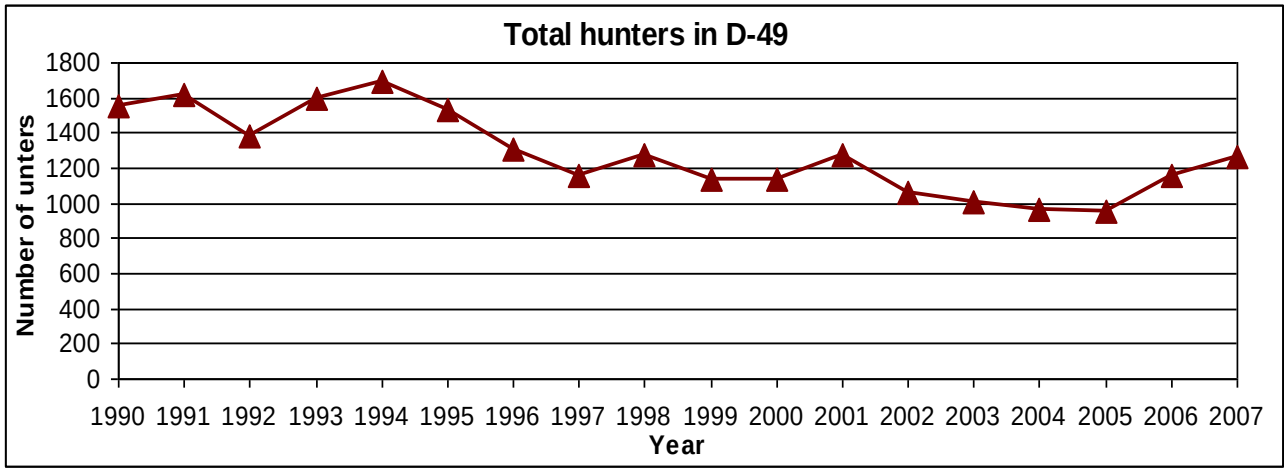

Figure 7. Number of deer hunters in D-49

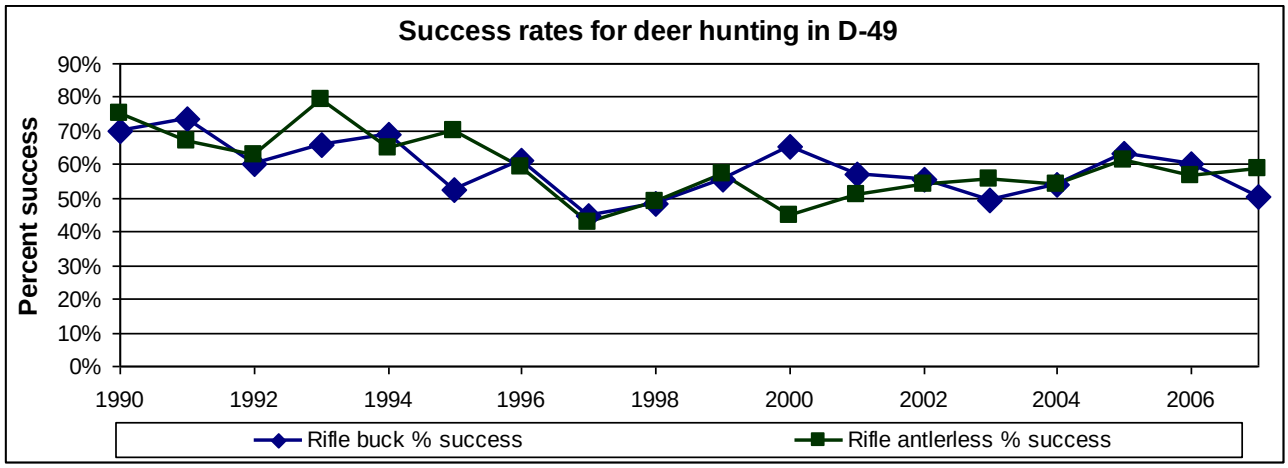

Figure 8. Hunting success in D-49

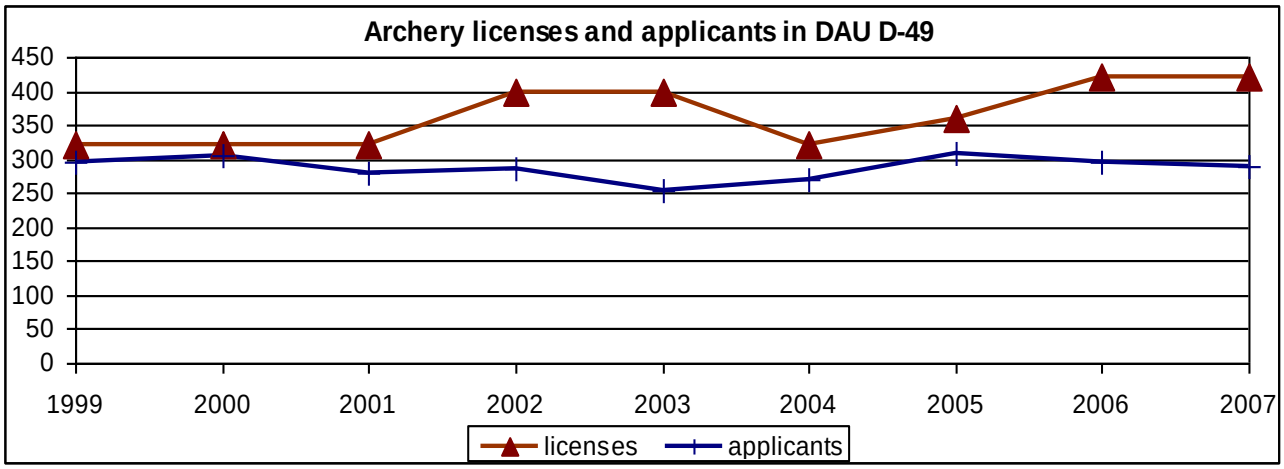

Figure 9. Number of archery licenses and applicants in D-49

Past Management Strategies

Rifle licenses are specific to either GMU 104 or to GMUs 105 and 106 in combination, while archery and muzzleloader licenses are valid for the entire DAU. A regular plains rifle season and a late rifle season have been held in these units since 2000. Prior to 2000, only a regular plains rifle season occurred. The late rifle season was added to allow more harvest late in the year when game damage problems typically occur. The late season is also a valuable tool for increasing buck harvest and reducing the sex ratio in years when it is over objective.

In an attempt to increase deer harvest and manage nuisance deer in suburban areas where high power rifle hunting is restricted, the number of archery licenses was increased in 2002 and 2003 (Figure 9). The strategy was ineffective because most archery hunters killed bucks, whereas female deer harvest is necessary to reduce deer populations (Figure 10). After it became apparent that the strategy was unsuccessful, archery licenses were reduced in 2004, but increased again in 2005 and 2006 to match increases in rifle licenses (Figure 9). To date, either-sex archery licenses have been issued, but antlerless archery licenses may be considered in the future. Other options could also be considered, such as having longer antlerless seasons with list B or C licenses.

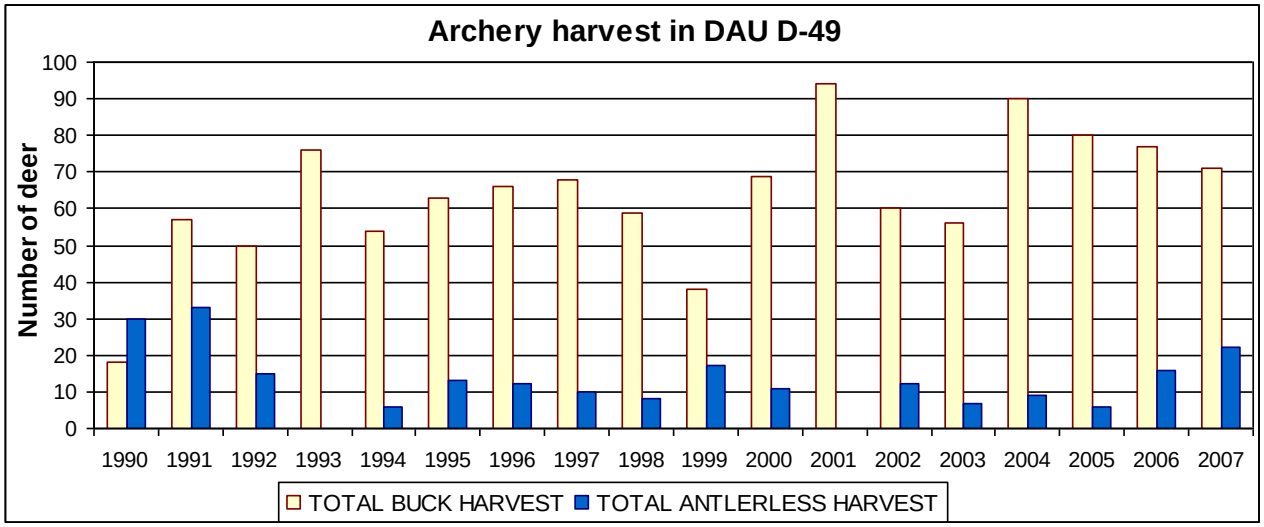

Figure 10. Archery harvest in D-49

CURRENT HERD MANAGEMENT

Population and Sex Ratio Objectives

The 2007 post-hunt estimate was approximately 5,250 deer, which is below the current population objective of 6,000 deer. The post-hunt population estimate for 2008 is expected to be closer to objective at about 5,600. The 2007 sex ratio for the DAU is estimated to be 30 bucks:100 does, which is equal to the current objective of 30 bucks:100 does.

Current Management Strategies

The management strategy for this DAU is to provide quality buck hunting opportunities while minimizing conflicts between deer and people. The primary means of reducing conflict is to issue late season rifle antlerless licenses so that doe deer can be hunted later in the year when most deer-human conflicts occur. Another means of managing conflict is to issue a small

number of special antlerless licenses for dispersal hunts on specific properties where damage is occurring. These licenses are used sparingly, and are intended to disperse animals rather than harvest a large number of deer.

Game damage was minimal until the winter of 2006-07, which was colder and snowier than it has been for several years. There were several reports of deer congregating at haystacks and four game damage claims were paid for deer on hay (Figures 11 and 12). Despite the availability of hay, wildlife managers still reported that some emaciated deer carcasses were found at haystacks. There were also numerous reports of intentional feeding of deer, and some reports of large numbers of deer leaving their normal winter range due to deep snow.

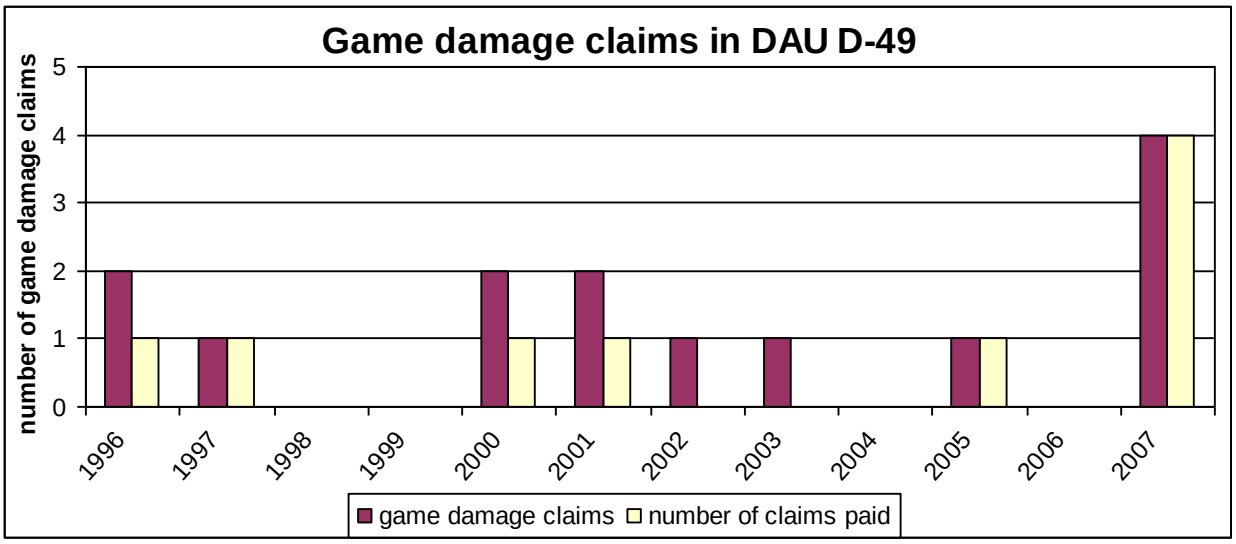

Figure 11. Game damage claims in DAU D-49 from 1996 to 2007

Typically there have been less than two game damage complaints per year, and game damage payments have been low in most years (Figures 11 and 12). Many problems have been effectively handled using dispersal hunts or by fencing to keep deer out of orchards and nurseries. Even in the unusually severe winter of 2006-07, only 4 damage claims were paid.

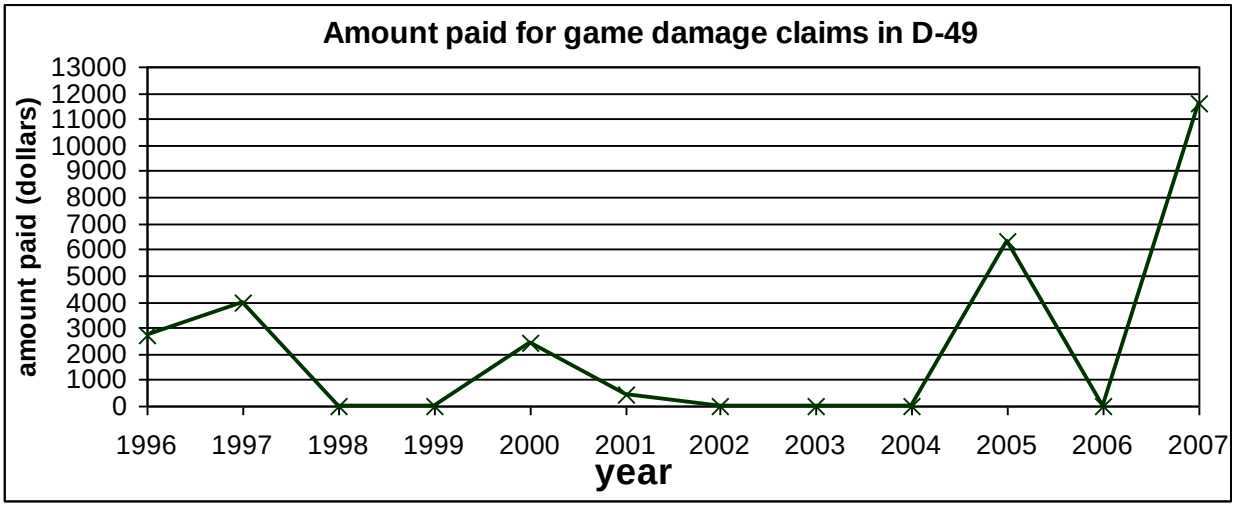

Figure 12. Amount paid for game damage claims in DAU D-49

MANAGEMENT ISSUES AND STRATEGIES

The primary purpose of the DAU planning process is to determine population and composition objectives, and input from stakeholders, landowners and other interested people is important in determining these objectives. Input was solicited through a press release to local papers and the CDOW website, in addition to direct mailing of surveys to hunters who applied for licenses in this DAU (Appendix A). Nearly 400 surveys and written comments were received in response to the survey.

The most common preference of respondents toward deer population numbers was to maintain the current population. Of the 390 total responses, 169 (44 percent) preferred to maintain the deer population at the current level. One-hundred thirty-three (35 percent) wanted an increase in the deer population and 55 (14 percent) wanted a decrease (Figure 13).

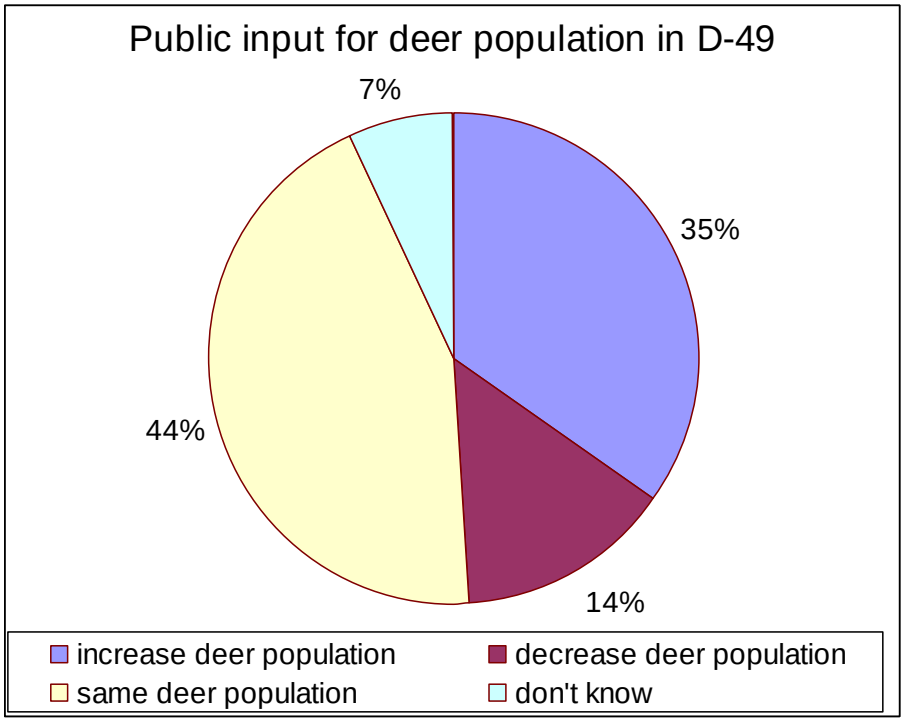

Figure 13. Overall public input for size of deer population in D-49

D-49 Public input results for deer population	Total	LANDOWNERS All Landowners	<160 acres	160-639 acres	640-1199 acres	1200-2399 acres	2400-3999 acres	4000+ acres
increase deer population	133	54	32	9	7	2	2	2
decrease deer population	55	37	11	6	5	9	1	5
Same deer population	169	68	35	10	6	3	7	9
don't know	27	5	2	1	1	1	0	0
no answer	6	2						
Total responses	390	166	80	26	19	15	10	16

Figure 14. Number of responses by landownership to D-49 deer population survey.

Among those who responded that they owned property in the DAU (166 total), 68 (41%) wanted no change in deer numbers, 54 (33%) wanted an increase and 37 (23%) wanted a decrease. Those who owned larger amounts of land tended to prefer either a decrease in the deer population or no change, and very few of these large landowners wanted higher deer numbers (Figures 14 and 15).

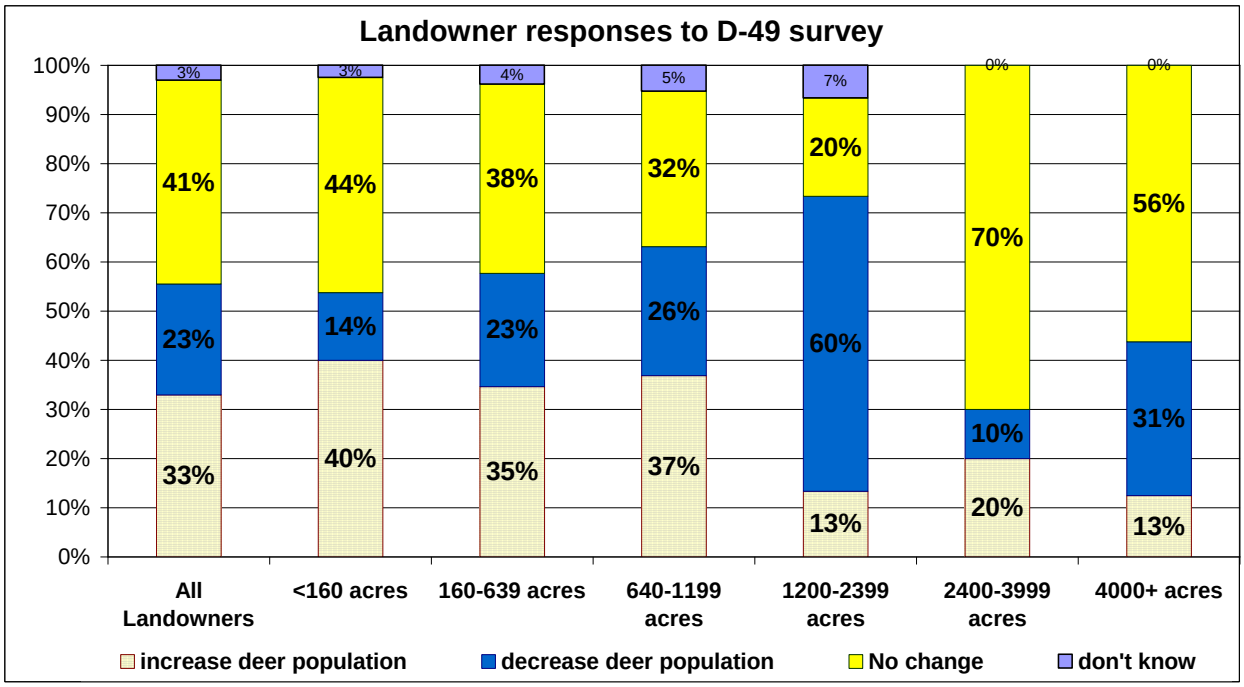

Figure 15. Public input from landowners for D-49 deer population

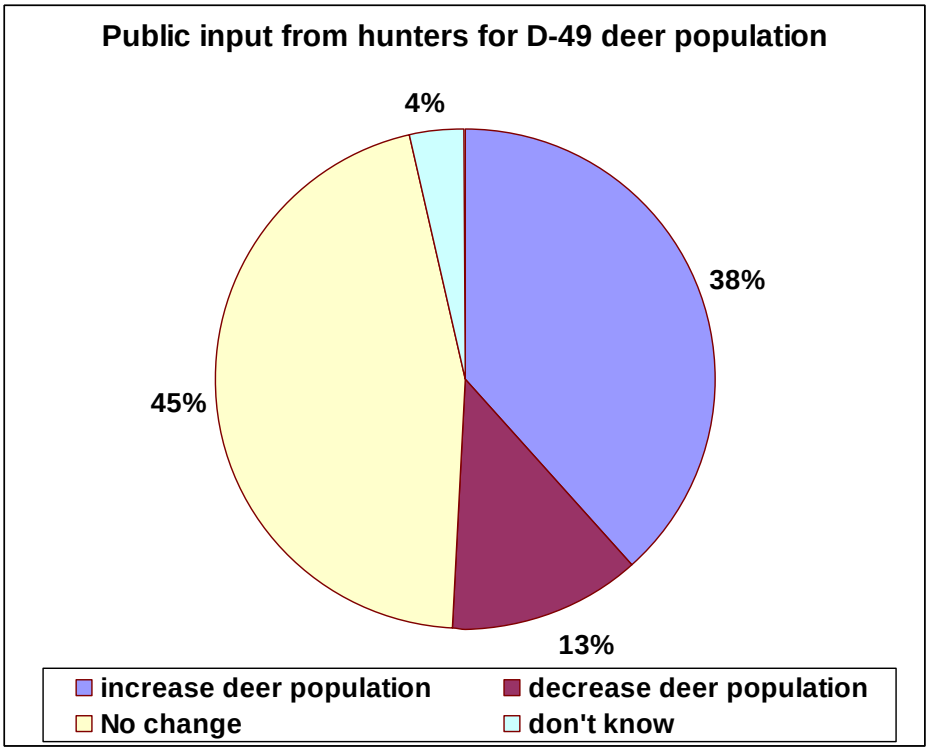

Figure 16. Public input from hunters for D-49 deer population

Among hunters, 102 (45 percent) wanted no change in the deer population, 86 (38 percent) favored an increase, and 28 (13 percent) preferred a decrease (Figure 16).

For the questions pertaining to herd composition; sex ratios and quality hunting opportunities, the most common preference was to manage for quality. One-hundred fifty-two (48 percent) chose quality management, while one-hundred nine (34 percent) chose no change and fifty-seven (18 percent) wanted the herd to be managed for maximum hunting opportunity (Figure 17).

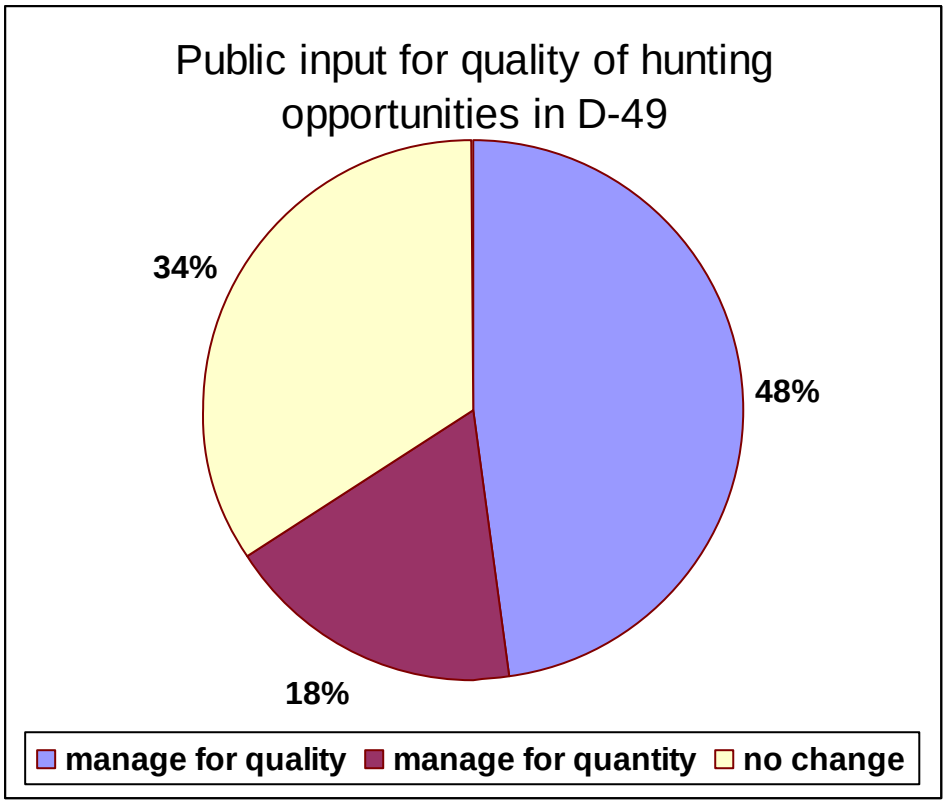

Figure 17. Public input for deer herd composition in DAU D-49

White-tailed Deer

Some concern was expressed about the number of white-tailed deer in the DAU. Eight comments were received that specifically mentioned white-tailed deer. Some respondents referred to competition with mule deer and others were concerned with interbreeding between the two species. These comments favored reducing the number of white-tailed deer and none of the comments expressed a desire for higher numbers of white-tailed deer.

The issue of white-tailed deer management can be addressed in the future with the addition of white-tailed deer only licenses. This management strategy has been implemented in other DAUs on the eastern plains of Colorado and in other states. If specific licenses or other management strategies are implemented for management of white-tailed deer, the objective will be to maintain the proportion of white-tailed deer in relation to mule deer at or below the current proportion. The effectiveness of management will be monitored as part of the CDOW post-hunt helicopter surveys that are currently used for obtaining data on age and sex ratios.

DEVELOPMENT OF MANAGEMENT ALTERNATIVES

Post-hunt Population Objectives

The population objective is selected independently from the herd composition objective. The CDOW acknowledges that estimating wildlife populations is an inexact science and habitat conditions and carrying capacity vary with fluctuations in weather and trends in land use. Therefore, the long-term population objective will be expressed as a range rather than a specific number.

Alternative 1: 4,200-4,800

Reduce the post-hunt population objective by 15% from the current estimate of 5,250 and by 25% from the previous objective of 6,000. Initially this would result in an increase in hunting opportunity due to the necessity of increasing doe licenses, particularly in the late rifle season, until deer numbers were reduced. However, after population reduction, alternative 1 would result in a decrease in hunting opportunities for both bucks and does for the long-term. Even if the population were reduced to this level, there could still be conflicts due to deer concentrations in areas where they are inaccessible to hunters. Agricultural damage complaints would be expected to decrease, and conflicts would likely be limited to small acreages where hunting does not control deer numbers.

Alternative 2: 5,500-6,500

Maintain the post-hunt population at the current objective level of 5,500 to 6,500. The population is currently slightly below this range, so it would be allowed to increase by about 5%, and by 12% to reach the center of the objective range. Since the deer population is growing, it is likely that few changes to current license numbers would be needed in order to meet this objective. The number of preference points needed to draw a license would not change under this alternative.

Alternative 3: 6,800-7,600

Increase the long-term post-hunt deer population to 6,800-7,600 deer, which is 37% higher than the current population and 20% higher than the previous objective. This objective would provide more buck and doe hunting opportunities as long as density dependent responses did not lower productivity. Under this scenario, the number of damage and nuisance complaints would likely increase. Deer-vehicle collisions would also be expected to rise as the deer population grows, especially near urban areas where more vehicles would be encountered. Hunting success would remain at or above current levels, but the increasing number of hunters might have difficulty gaining access to land for hunting.

Post-hunt Herd Composition Objectives

Alternative 1: 20-25 bucks:100 does

Decrease the sex ratio objective to 20-25 bucks:100 does, which is a reduction of 10 bucks:100 does from the previous sex ratio objective. This would result in fewer bucks in the population and a smaller number of large mature bucks. The public comments did not support this alternative.

Alternative 2: 30-35 bucks:100 does

Maintain the sex ratio at 30-35 bucks:100 does. This objective would continue to provide quality hunting opportunities, but some hunters might be disappointed in the number of mature bucks available for harvest. Hunting opportunity would not change, and management strategies would remain similar to current strategies.

Alternative 3: 40-45 bucks:100 does

Increase the sex ratio objective to 40-45 bucks:100 does, which is an increase of 10-15 bucks:100 does above the current level. Public comments support this alternative. If the total deer population remains unchanged, the number of buck licenses would initially have to be decreased to allow the sex ratio to increase. This would result in more bucks in the population, but a decline in buck hunting opportunity. As a result, the number of preference points required to draw a buck hunting license would increase. It might take several years to draw a license, but there would be more mature bucks in the population and success rates for buck hunters would also increase.

PREFERRED ALTERNATIVES

Population objective:

The preferred alternative for the deer population size in D-49 is Alternative 2: 5,500-6,500 deer. Public comments supported this alternative, and the CDOW believes that the current population size is appropriate for this DAU. There will be little change in hunting opportunity and management strategies will be similar to current strategies. Although, techniques to increase doe harvest near residential areas will be explored.

Herd composition objective:

The preferred alternative for herd composition is Alternative 2: 30-35 bucks:100 does. Although overall public comment supported a higher sex ratio, landowners have expressed dissatisfaction about the difficulty of drawing buck licenses. If the sex ratio increases, more preference points will be needed to draw a buck license. Since the current observed and modeled sex ratios are near the lower end of the objective range, there will be an increase in the proportion of bucks in the herd with this alternative. Therefore, the CDOW recommends Alternative 2 as the preferred alternative because it balances the demand for quality deer hunting opportunities with availability of hunting opportunities for landowners and the public.

LITERATURE CITED

Wood, A.K., R.J. Mackie, K.L. Hamlin. 1989. Ecology of Sympatric Populations of Mule deer and White-tailed deer in a Prairie Environment. Wildlife Division , Montana Dept. of Fish, Wildlife & Parks.

APPENDIX A: PUBLIC INPUT QUESTIONNAIRE

OPPORTUNITY FOR PUBLIC COMMENT

ON DEER and PRONGHORN MANAGEMENT

In Data Analysis Units D-49 and PH-35
Deer Game Management Units 104, 105, 106 and Pronghorn Game Management Units 51,104,105

Dear Interested Citizen:

Deer and Pronghorn herds in Colorado are managed at the Data Analysis Unit (DAU) level. The management of each herd is guided by a herd specific management plan called a DAU plan. DAU plans describe herd population and management histories, population objectives and management strategies for a 10 year period. The DAU planning process is the Colorado Division of Wildlife's (CDOW) method for incorporating the concerns and desires of the public with the biological capabilities of a specific herd. Public input is, therefore, a very important part of the DAU planning process.

Wildlife managers have begun the process of updating both the deer and pronghorn management plans for the Denver area and Game Management Units (GMU) 104, 105, and 106 for deer and GMU's 51, 104, and 105 for pronghorn. The CDOW is seeking your input on the future management of these herds. The information you provide will help the CDOW develop objectives and management strategies of both species of big game in these areas.

Please complete the following survey and return it to:

COLORADO DIVISION OF WILDLIFE
Attn: Travis Harris
6060 Broadway
Denver, CO 80216

Surveys must be postmarked by April 9, 2007

The Colorado Division of Wildlife manages these deer and pronghorn herds to provide the public with hunting and viewing opportunities while minimizing conflicts and habitat damage. Often in order to do this, a balance is needed in both the total number of animals and the proportion of males (bucks) in the herd. Both management plans (DAU plans) will therefore, define 1) a population objective and 2) a male to female ratio objective (buck:doe).

Population Objectives: The Division strives to manage big game populations within both the biological and social carrying capacity of the herd. The biological carrying capacity is the number of animals that can be supported by the available habitat. The social carrying capacity is the number that will be tolerated by the people who are impacted by the herd. The PH-35 pronghorn herd is currently slightly above the previous long-term objective and the D-49 deer herd is also slightly above the previous objective. When pronghorn populations are controlled at levels below both the biological and social carrying capacity, people enjoy viewing, photographing and hunting pronghorn while pronghorn/human conflicts are minimized. As the number of pronghorn in an area increases, conflicts with people may also increase. These conflicts can be auto/animal collisions, impacts to gardens or yards, damage to agriculture, etc. These issues are similar with deer as well. To control herd numbers to meet population objectives the CDOW will either increase or decrease the number of doe licenses available.

Question 1:
Would you like the number of **pronghorn** in GMUs 51, 104 and 105 to:

_____ Increase

_____ Stay the same

_____ Decrease

_____ Don't Know

Why?

Would you like the number of **deer** in GMUs 104, 105 and 106 to:

_____ Increase

_____ Stay the same

_____ Decrease

_____ Don't Know

Why?

Male:Female Ratio Objective: Deer and pronghorn herds can be managed to maximize hunting opportunity or to maximize the quality buck hunting. Quality is typically identified by fewer hunters in the field and larger bucks. If a herd is managed to maximize quality, there will be more mature/large bucks and fewer buck licenses are issued in order to increase the number of bucks in the population (higher buck:doe ratio). If a herd is managed to maximize hunting opportunity, more buck licenses are made available and buck hunters are able to hunt more frequently. As a result, there are less bucks in the herd (lower buck:doe ratio) and fewer mature/large bucks. Typically, there is a trade-off between the number of licenses (opportunity) and the size and maturity of bucks (quality) available to hunters. However, in D-49 and PH-35 most of the deer and pronghorn that make up the herds within the DAU are found on private property. It is important to recognize that private landowners play an important role in management of big game herds in these DAU's. Access to animals on private property can influence both hunter opportunity and buck:doe ratios. Increasing licenses may not increase opportunity if hunters cannot access deer or pronghorn on private property within the DAU. Large, mature (quality) bucks can result even if buck licenses are increased if access to private property in the DAU is limited.

Question 2:
For the purposes of **Pronghorn** hunting, should GMUs 51, 104 and 105 be managed for:

_____ Increased **quality** of hunting opportunity (higher buck:doe ratio, fewer hunters in the field, but more difficult to draw a buck license)
_____ Maximum **quantity** of hunting opportunity (lower buck:doe ratio, more hunters in the field, and easier to draw buck licenses)
_____ Status Quo

Similar trade-offs between hunter opportunity and numbers of mature bucks exist in D-49. For the purposes of **deer** hunting, should GMUs 104, 105, and 106 be managed for:

_____ Increased **quality** of hunting opportunity (higher buck:doe ratios,)

_____ Maximum **quantity** of hunting opportunity (lower buck:doe ratios)

_____ Status Quo

Question 3:

Do you hunt deer in D-49?	Yes	No
Do you hunt pronghorn in PH-35?	Yes	No

Question 4:

Do you live in either D-49 or PH-35	Yes	No

Question 5

If you own property in D-49 and/or PH-35, How much (please circle)?

D-49 (GMU's 104, 105, 106)	PH-35 (GMU's 51, 104, 105)
<160 acres	<160 acres
160-639 acres	160-639 acres
640-1199 acres	640-1199 acres
1200-2399 acres	1200-2399 acres
2400-3999 acres	2400-3999 acres
4000+ acres	4000+ acres

Please provide additional comments on the future management of DAU's D49 and/or PH35 below.