

**2002**

MULE DEER MANAGEMENT GUIDELINES

DEER DAU D-3

GAME MANAGEMENT UNITS

6, 16, 161, 17, & 171

Prepared for:

Colorado Division of Wildlife (CDOW)

Northwest Region

By:

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## DAU D-3 (North Park) EXECUTIVE SUMMARY

GMU's: 6, 16, 17, 161, 171

Land Ownership: 35.9% Private, 31.9% USFS, 18.2% BLM, 1.7% ANWR, 12% State

Posthunt Population: Objective 6000      2002 Estimate 6,021      Recommended 5,400-6,000

Posthunt Sex Ratio (Bucks/100 Does): Objective 30-40      2002 Observed 55      2002 Modeled 44  
Recommended 30-40

Table 1.

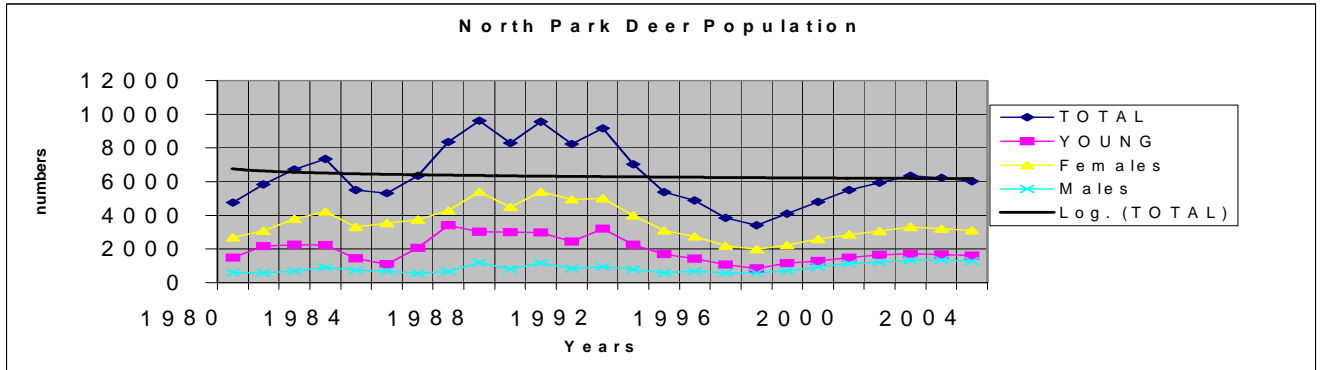


Table 2.

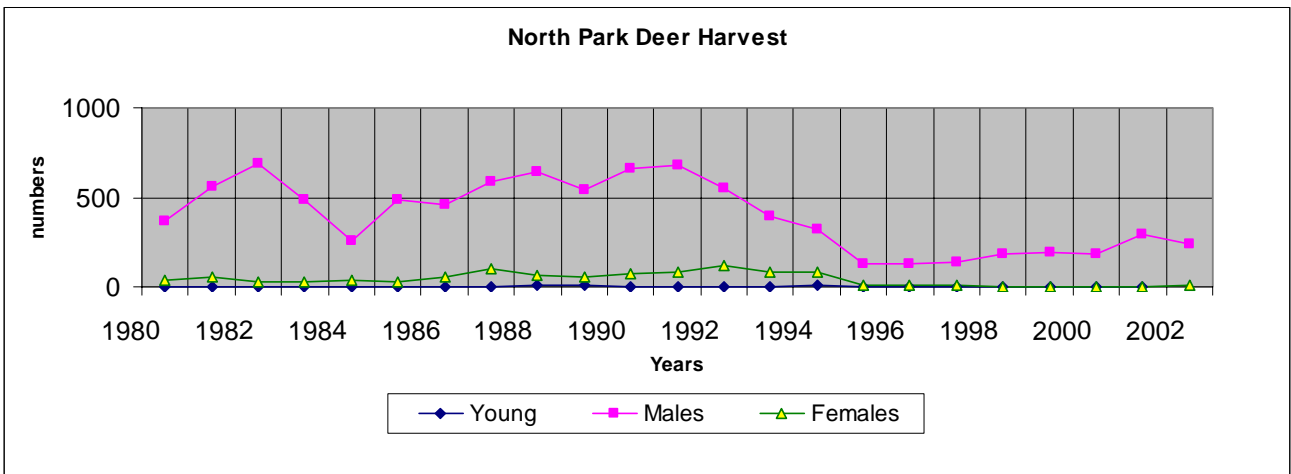
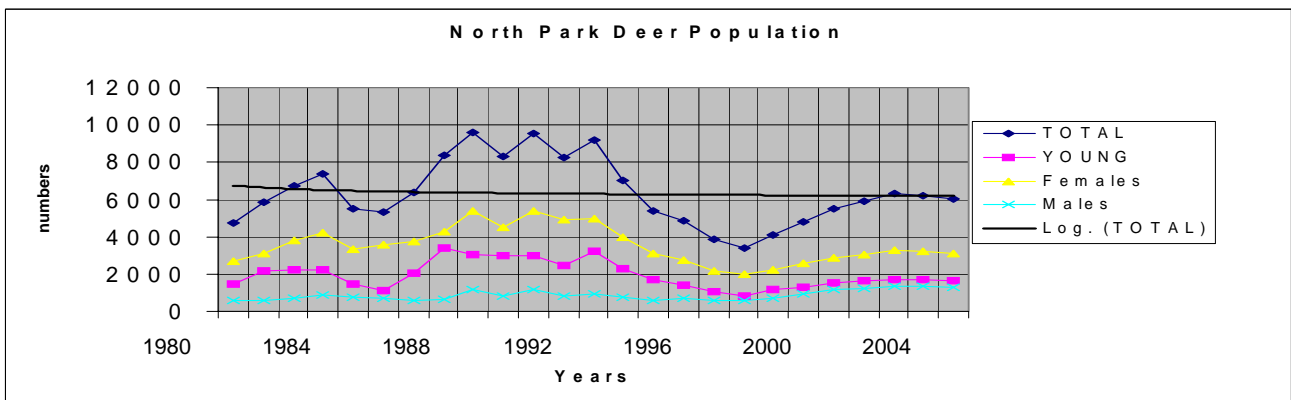


Table 3.



## **Background**

Don Gore, retired North Park wildlife officer, reported from ground counts of 10,000 deer wintering in North Park in the late 1950's and early 60's. There were several small die-offs of deer in the 1950's and 60's, usually in haystacks. From 1959 through 1962 hunters were allowed to have as many as three licenses in an effort to reduce the deer population.

Written records of aerial trend classifications in North Park start in 1969. The highest numbers of deer that year were on the Eastside and Buffalo Ridge. Buffalo Ridge does not have wintering deer today. In 1973 the deer trend classification showed a sex and age ratio of 59 bucks/100 does and 69 fawns/ 100 does. The largest concentrations of wintering deer were on Independence Mountain and Walden Flats. Few deer winter in those areas today. In January of 1984 deer were heavily concentrated due to winter severity. The highest numbers were still on Independence Mountain and Walden Flats. A large number of deer died that winter and the classification count dropped more than 30 % compared to previous years. The production of fawns dropped significantly, to 31 fawns/100 does in 1985. The population was depressed for two years and started to recover in 1987. The fawn production jumped to 80 fawns/100 does in 1987. However in the 1990's the deer population again declined due to severe winters in 1992-93 and 1995-96. Elk competition has reduced the available winter range for mule deer.

There is no previous Deer DAU Plan for North Park. A population objective has not been established. North Park is managed as a Quality Animal Management Unit, with a goal of providing mature bucks. The mule deer population has increasing in recent years because of mild weather conditions and little or no doe harvest since 1994. The deer population is at population objective. Doe deer hunting permits will be recommended starting in 2005 to hold the population at 6,000. Buck harvest will have to be increased substantially.

## **Significant Issues**

There has been a major shift in wintering deer from North Park to Wyoming. Independence Mountain, once a major wintering area for deer, has very few deer wintering today. The same is true of the area north of Walden called Walden Flats. Wintering deer populations have shifted to the east side of North Park or Sand Dunes area, primarily because of good bitterbrush habitat. A deer migration study has been conducted in north Park over the past two years. Although the study is not completed it is safe to conclude from the information so far that ninety percent of the deer in North Park migrate into Wyoming and Middle Park in the winter. Wyoming is concerned about the stress deer are putting on winter range vegetation and are trying to reduce the deer population.

## Management Alternatives

1. POST-SEASON DEER POPULATION OBJECTIVE OF 5,000 DEER with an acceptable range of 4,500 to 5,500, and a SEX RATIO OF 30 TO 40 BUCKS/100 DOES.  
Reviewing the population graph, 9,600 deer is probably the maximum carrying capacity of this deer population in the last 20 years (See Graph 3, next page). Also ground counts from the 1950's and 60's support the opinion that 10,000 deer is probably the highest level of deer there has been in North Park. The population level of 5,000 deer is below the current population level and about 52% of the maximum carrying capacity. Deer resources would be maximized and recruitment should increase. The deer population should be able to maintain this level, except for the most severe winters.
2. POST-SEASON DEER POPULATION OBJECTIVE OF 6,000 deer, with an acceptable range of 5,400 to 6,600 DEER, WITH A SEX RATIO OF 30 TO 40 BUCKS PER 100 DOES.  
This is where the current level of the deer population is now. This population size is mid-level in the fluctuations of the deer population (see Graph 3). This level is approximately 62 % of the maximum carrying capacity. At this level the deer population should have enough resources to maintain the present recruitment rate. This level of the deer population is on the end lower end of the maximum sustained yield part of the curve.
3. POST-SEASON DEER POPULATION OBJECTIVE OF 7,000 DEER, with an acceptable range of 6,300 to 7,700 and a SEX RATIO OF 30 TO 40 BUCKS/100 DOES.  
This population level would be approximately 73% of maximum carrying capacity. The deer population could be maintained at this level through average winters, but any above average winter would cause some winter kill. This level is above the mid-point on the growth curve and recruitment would be reduced and deer resources would start to be stressed.

## PREFERRED ALTERNATIVE

**Alternative 2 is the preferred alternative**, a deer population objective of **6,000 deer and 30 to 40 bucks per 100 does**. At this level the deer population will have enough resources for most winters and should have a good recruitment rate most years. The 7,000 deer population level may be too high, putting stress on the habitat and reducing the recruitment rate. Also with the possibility of CWD in the future the deer population density should be kept as low as possible. The 5,000 deer population alternative would provide the most resources for the deer population and increase the recruitment rate, but would reduce the hunting recreation opportunity significantly. Alternative 2 is the most reasonable alternative balancing hunter demand and the requirements of the deer population.

**This plan was approved by the Colorado Wildlife Commission in 2002**

**DEER DATA ANALYSIS UNIT (DAU) D-3  
NORTH PARK  
May 1, 2002**

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## **DAU PLAN SUMMARY**

**North Park Deer- DAU D-3 ( GMUs 6, 16, 161, 17, 171 )**

**Current Population Estimate: Post-season 2003- 6,045 deer**

**Proposed Population Objective: 6,000 deer with an acceptable range of 5,400 to 6,600**

**Current Sex Ratio: 47.7 bucks per 100 does, post-season 2003**

**Proposed Sex Ratio: 30 to 40 bucks per 100 does**

**There is no previous Deer DAU Plan for North Park. A population objective has not been established. North Park is managed as a Quality Animal Management Unit, with a goal of providing mature bucks. The mule deer population has increasing in recent years because of mild weather conditions and little or no doe harvest since 1994. The deer population is at population objective. Doe deer hunting permits will be recommended starting in 2005 to hold the population at 6,000. Buck harvest will have to be increased substantially. A deer migration study has been conducted in north Park over the past two years. Although the study is not completed it is safe to conclude from the information so far that ninety percent of the deer in North Park migrate into Wyoming and Middle Park in the winter. Wyoming is concerned about the stress deer are putting on winter range vegetation and are trying to reduce the deer population. The habitat study**

## **INTRODUCTION AND PURPOSE**

**The Division of Wildlife (DOW) is responsible for the maintenance of Colorado's big game herds at population levels that are established through a public review process and approved by the Colorado Wildlife Commission.**

**The Data Analysis Unit (DAU) Plan is a strategic plan that addresses two primary decisions, the number of animals the DAU should contain and the desired sex ratio. The geographic area of each DAU is drawn to encompass the year-round range of the majority of the animals of that species. Normally the DAU encompasses several Game Management Units (GMU) that divide the DAU into workable sub-units, primarily for harvest management. The DAU Plan is also a collection of important management data of a particular wildlife population. This document includes: alternate strategies, evaluation of those strategies, and a preferred alternative. The DAU Plan process is designed to examine public desires and balance them with biological capabilities. The population objective is established for a five-year period. The population objective drives the decisions related to annual license numbers that will determine the number of animals that need to be harvested to meet population objectives. Management by objective is a process based on an annual cycle of information collected from sex and age ratio flights, survival studies, and harvest data. Analysis of the data results in recommendation of harvest objectives to meet the population objectives for that DAU. Harvest objective recommendations culminates each year with the Colorado Wildlife Commission adopting the number of limited hunting permits to issue in order to achieve the population objective.**

## **DESCRIPTION OF THE DATA ANALYSIS UNIT (DAU)**

### **Location**

**Deer DAU D-3 is in North Central Colorado and comprises all of Jackson County commonly called North Park. DAU D-3 consists of Game Management Units (GMUs) 6, 16, 161, 17, and 171. North Park is an intermountain park on the east side of the Continental Divide. It is drained by and is the headwaters of the North Platte River. The major drainages that make-up the North Platte drainage in Colorado are Grizzly Creek, the Illinois River, the Michigan River, the Canadian River, and the North Fork of the North Platte.**

**The DAU is bounded on the south by the Rabbit Ears Range, on the west by the Park Range, to the east by the Medicine Bow and Never Summer Ranges, and Independence Mountain and the Wyoming border on the north. DAU D-3 encompasses 1,628 square miles or 1.042 million acres.**

### **Physiography**

**Elevations in North Park range from 7,800 feet at Northgate to 12,965 feet at Clark's Peak. The average elevation of the open, sagebrush-grassland park is 8,000 feet. North Park is a relatively flat; sagebrush grassland with numerous wetlands interspersed with wide, willow dominated drainages. The mountains that surround the park rise rapidly to the alpine zone above timberline. The montane zone is dominated by lodgepole pine stands and to a lesser extent aspen and spruce-fir stands.**

### **Climate**

**North Park has windy, cold, snowy winters and short, cool, dry summers. The average temperature measured at Walden is 37.8 degrees F, with a temperature range between -50 degrees F and 90 degrees F. The growing season averages thirty-three days, mostly in the month of July. The average annual precipitation is ten inches, which includes fifty inches of snowfall that comes in a few, large snowstorms. The prevailing winds are to the northeast.**

### **Land Status**

**Land ownership in DAU D-3 is 36% private land, 12% state land and 52% federal land. The Routt National Forest covers 32% of the DAU and most of the mountainous areas that surround the park. The Bureau of Land Management property, 18.2%, is primarily sagebrush habitat in the center of the park, where most of the private land is also located. The BLM manages the majority of the sagebrush habitat critical to deer. The Colorado State Forest, 6.8%, is found on the east side of the park. The Arapaho National Wildlife Refuge, 1.7%, manages important habitat in the center of the park. State Trust Lands, 4.9%, are primarily in sagebrush habitat and are critical to deer. See the Appendix for tables on land ownership breakdown, critical deer habitat breakdown, and deer activity areas.**

## Land Use

Agriculture, and beef production are the primary land uses in North Park. This high, cold semi-arid habitat has a strong agricultural base of irrigated hay meadows and cattle grazing. North Park also provides some of the most productive wildlife habitat in the state, especially for waterfowl. Timber harvest is still an important land use, although the lumber mill in Walden has closed. Hunting is an important part of the economy. Big game hunting brings in the largest number of hunters, but small game and waterfowl hunting also have a significant impact. North Park has the largest moose population in Colorado.

## HABITAT CONDITIONS AND CAPABILITY

Habitat conditions for mule deer are adequate in North Park for the recommended population objective. Deer are limited to relatively small winter range areas. It is generally agreed that there has been a decline in the productivity of vegetation in the sagebrush-grassland community in the western U.S. Two of the wildlife species dependent on the sagebrush community have declined in numbers and productivity. These are mule deer and sage grouse. Specifically, in North Park the capability of the sagebrush habitat has been reduced because of the lack of fire and the consequential old age of the shrub component. Overly dense and crowded sagebrush stands out compete other vegetation. Deer, because of their limited digestive system, can not digest large quantities of grass to obtain the level of nutrition necessary. They require food with more protein and higher digestibility.

The most important mule deer winter ranges in North Park are sagebrush-bitterbrush ranges and aspen. Sagebrush is generally high in protein, equaling alfalfa. Sagebrush is also high in volatile oil, and adversely affects rumen microbes. Studies suggest that deer can tolerate only 15-30 percent sagebrush in their diet (Wallmo). Ammann estimated that dry-matter digestibility, below 50 %, would not provide enough energy to maintain mule deer. Both sagebrush and bitterbrush exceed 50 % digestibility in winter. The diverse habitats, with several species of woody plants, provide most of the winter range that deer use in North Park. Protecting and managing these habitats for mule deer is critical. Bitterbrush is more vulnerable to overbrowsing than sagebrush (Shepard). If the bitterbrush continues to deteriorate, North Park will support fewer deer.

Maturation of the sagebrush community has resulted in a reduction in the nutrient value of the food supply and the corresponding reduction in the reproductive potential of mule deer. Winter malnutrition in adult deer can result in fewer fawns the next year. At least one researcher found that deterioration of the sagebrush habitat is the primary reason that there has been a 40 % decline in mule deer productivity statewide over the last twenty-five years (White). The severity of the winter or spring weather determines the survival of deer, especially fawns, on a short-term basis. However, deer numbers in the long term are ultimately limited by habitat quality. Projects that set back the seral stage of the vegetation to a younger, more nutritional, productive, and palatable stage appears to be the only management activity that will ultimately increase the populations of wildlife species using the sagebrush-grasslands of North Park. In 2000 the DOW began using Dixie Harrow equipment in sagebrush habitat to thin the sagebrush and open up the sagebrush canopy. This will allow grass, forbs and other browse species to become prolific without the overwhelming competition of sagebrush.



## **Habitat Partnership Program**

**In 1990 the Colorado Division of Wildlife created the Habitat Partnership Program (HPP) to address fence and forage damage conflicts on private and public land caused by big game. The North Park HPP Committee was formed and the Wildlife Commission in 1992 approved the Big Game Distribution Management Plan. There have not been any game damage problems related to deer in North Park.**

**HPP is now an integral part of big game management efforts in North Park and one of the most successful HPP committees in the state. This locally run program is funded by 5% of the big game license revenues generated in the DAU.**

**The North Park HPP Committee has been a leader in holistic range management sponsoring workshops for livestock operators and federal land managers. They are involved in a grazing management system with two landowners and the BLM to improve forage on one of the major winter range areas in North Park.**

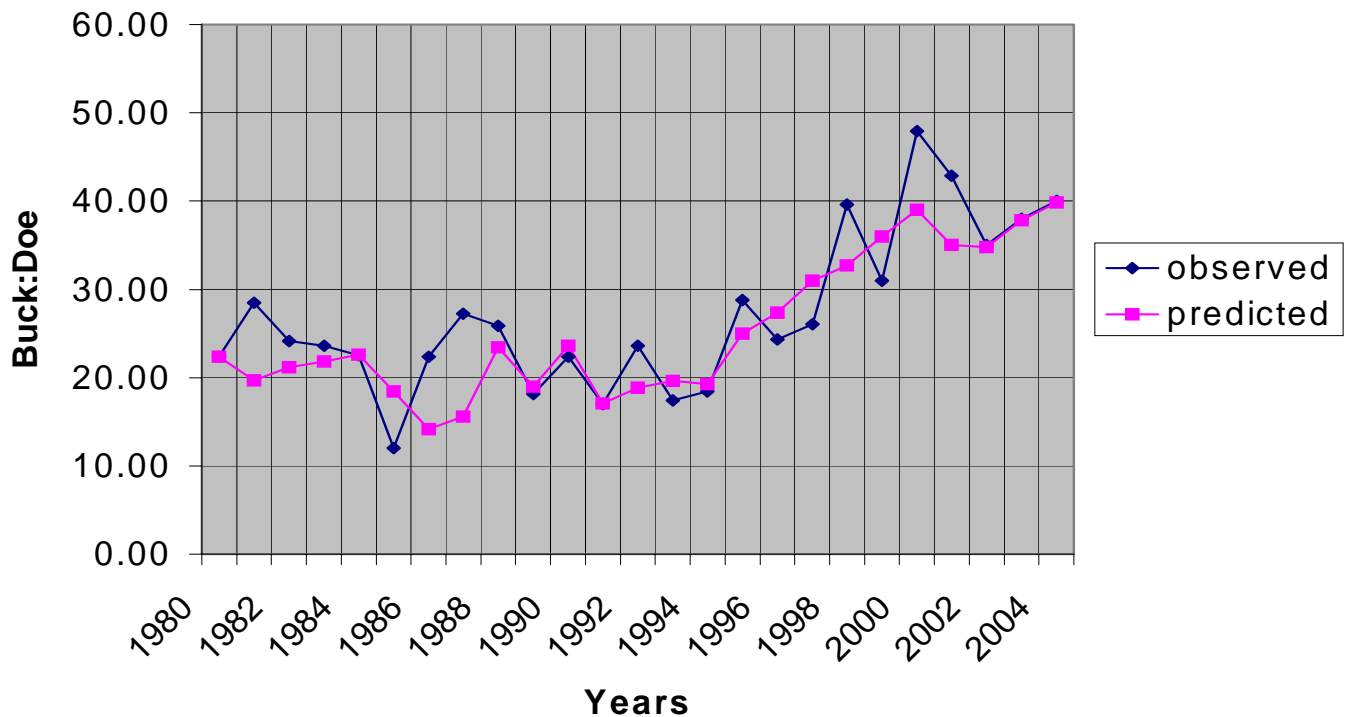
**In 1993, the North Park HPP Committee applied for and received a grant from “Seeking Common Ground.” The grant funds were used to form the Owl Mountain Partnership (OMP). OMP is an ecosystem management partnership that involves cooperation among private landowners, federal, state, and local government agencies. The OMP has accomplished many on-the-ground projects to improve habitat for both wildlife and livestock. The original boundaries of the OMP were the southeast part of North Park, but in 1997 the OMP Steering Committee expanded the program to include all of Jackson County.**

## **MANAGEMENT HISTORY**

**Don Gore, retired North Park wildlife officer, reported from ground counts of 10,000 deer wintering in North Park in the late 1950’s and early 60’s. There were several small die-offs of deer in the 1950’s and 60’s, usually in haystacks. From 1959 through 1962 hunters were allowed to have as many as three licenses in an effort to reduce the deer population.**

**Written records of aerial trend classifications in North Park start in 1969. The highest numbers of deer that year were on the Eastside and Buffalo Ridge. Buffalo Ridge does not have wintering deer today. In 1973 the deer trend classification showed a sex and age ratio of 59 bucks/100 does and 69 fawns/ 100 does. The largest concentrations of wintering deer were on Independence Mountain and Walden Flats. Few deer winter in those areas today. In January of 1984 deer were heavily concentrated due to winter severity. The highest numbers were still on Independence Mountain and Walden Flats. A large number of deer died that winter and the classification count dropped more than 30 % compared to previous years. The production of fawns dropped significantly, to 31 fawns/100 does in 1985. The population was depressed for two years and started to recover in 1987. The fawn production jumped to 80 fawns/100 does in 1987. However in the 1990’s the deer population again declined due to severe winters in 1992-93 and 1995-96. Elk competition has reduced the available winter range for mule deer.**

## North Park Deer Buck/Doe Ratio



(Graph 1)

### CURRENT MANAGEMENT

Rifle doe licenses were eliminated in 1993, but buck licenses were unlimited. In 1995, the season was changed to totally limited, antlered only rifle licenses. The post-season fawn/doe ratio for 1999 through 2001 has averaged 52 fawns/100 does. Recent mild winters and no doe harvest have produced moderate increase in the deer population (see Graph 3, page 8).

Population numbers have increased in response to the reduction in harvest. The buck/doe ratio has increased to over 40 bucks/100 does with more than 30 % of the bucks being mature (see Graph 1). Because of the higher numbers of mature bucks in North Park, DAU D-3 is managed as a Quality Animal Management Unit. In 1999 the Wildlife Commission approved a policy that directs the Division of Wildlife to manage 20% of the deer resources west of I-25 for quality animals. North Park, D-3, scored high in qualifying and were designated as a Quality Animal Management Unit.

There has been a major shift in wintering deer from North Park to Wyoming. Independence Mountain, once a major wintering area for deer, has very few deer wintering today. The same is true of the area north of Walden called Walden Flats. Wintering deer populations have shifted to the east side of North Park or Sand Dunes area, primarily because of good bitterbrush habitat.

Chronic wasting disease (CWD) is not a factor in the deer population at this time in North Park. The CDOW has been collecting samples from hunters for testing and CWD has not been found in North Park. There is a potential for CWD problems in the future, because of commercial elk facilities in North Park and the closeness of the endemic CWD area in Northeast Colorado.

## **DISCLAIMER FOR POPULATION SIZE ESTIMATES**

Estimating population size of wild animals over large geographic areas is an extremely difficult and inexact exercise. In several research projects, attempts have been made to accurately count all the known number of animals in large fenced areas. All of these efforts have failed to consistently count all of the animals. In some cases less than 50% of the animals can be observed and counted. High-tech methods using infrared sensing have also met with limited success. The DOW recognizes this is a serious challenge to our management. The DOW attempts to minimize this problem using the latest technology and inventory methodology available. Most population estimates are derived using computer model simulations that involve estimations for mortality rates, hunter harvest, wounding loss and annual production. These simulations are then adjusted to align on measured post-hunting season age and sex ratio classification counts. The DOW recognizes the limitations of the system and strives to do the best job with the resources available. 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 DOW will use this new information and the new techniques. This may result in significant changes in the population size estimates and management strategies. It is recommended that the population estimates presented in this document be used only as an index or as trend data and not as an absolute estimate of the deer population in the DAU.

## **POPULATION SIZE AND HERD STRUCTURE ALTERNATIVES**

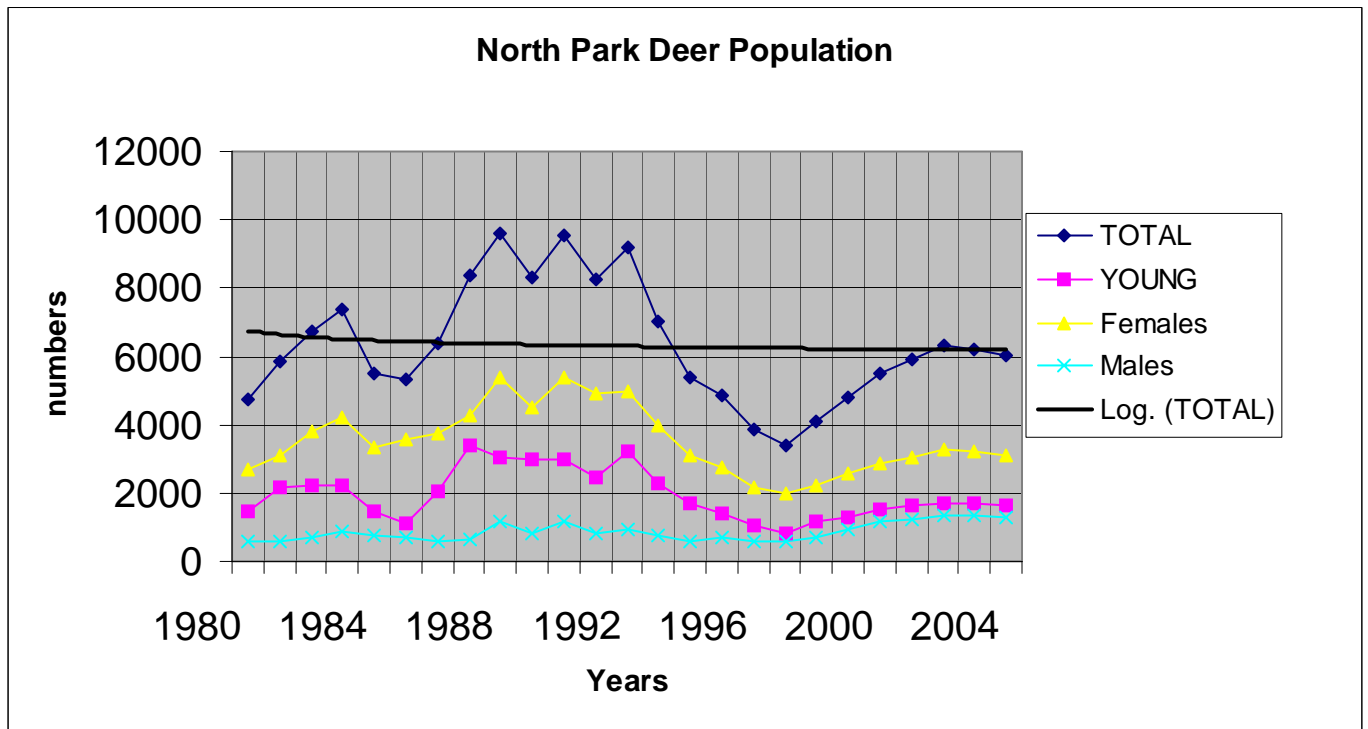
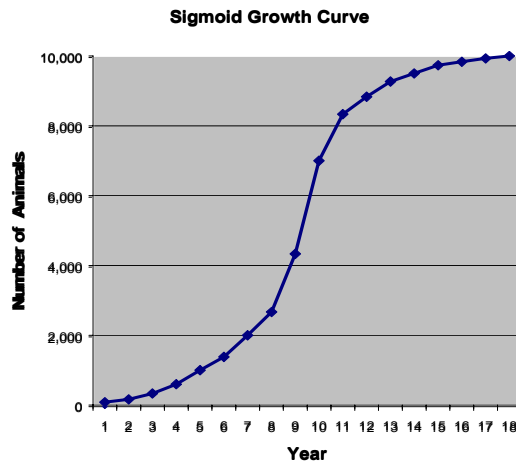
Deer populations are density dependent. This means that as the deer population approaches the carrying capacity of the habitat, the recruitment rate (number of fawns surviving to one year of age) declines in response to limited resources. Poor nutrition produces underweight fawns that have a lower survival rate. A deer population grows in a mathematical relationship called the Sigmoid Growth Curve (see Graph 2). The middle part of this growth curve is the most productive, because the population has reached a level that is not significantly affected by predation or accidents and resources are plentiful. This stage in growth curve is called “maximum sustained yield” (MSY). The MSY in the deer herd on the graph would be 5,000. The deer population is at its highest recruitment rate at this stage. The deer population should be kept below maximum carrying capacity, at maximum sustained yield, to insure that enough resources are available for a healthy deer population. A limited number of doe licenses, along with limited buck licenses, will be necessary to maintain the deer population below maximum carrying capacity.

(Graph 2)

## POPULATION ALTERNATIVES

### 1. POST-SEASON DEER POPULATION OBJECTIVE OF 5,000 DEER with an acceptable range of 4,500 to 5,500, and a SEX RATIO OF 30 TO 40 BUCKS/100 DOES.

Reviewing the population graph, 9,600 deer is probably the maximum carrying capacity of this deer population in the last 20 years (See Graph 3, next page). Also ground counts from the 1950's and 60's support the opinion that 10,000 deer is probably the highest level of deer there has been in North Park. The population level of 5,000 deer is below the current population level and about 52% of the maximum carrying capacity. Deer resources would be maximized and recruitment should increase. The deer population should be able to maintain this level, except for the most severe winters.



(Graph 3)

### 2. POST-SEASON DEER POPULATION OBJECTIVE OF 6,000 deer, with an acceptable range of 5,400 to 6,600 DEER, WITH A SEX RATIO OF 30 TO 40 BUCKS PER 100 DOES.

This is where the current level of the deer population is now. This population size is mid-level in the fluctuations of the deer population (see Graph 3). This level is approximately 62 % of the maximum carrying capacity. At this level the deer population

should have enough resources to maintain the present recruitment rate. This level of the deer population is on the end lower end of the maximum sustained yield part of the curve.

**3. POST-SEASON DEER POPULATION OBJECTIVE OF 7,000 DEER, with an acceptable range of 6,300 to 7,700 and a SEX RATIO OF 30 TO 40 BUCKS/100 DOES.**

This population level would be approximately 73% of maximum carrying capacity. The deer population could be maintained at this level through average winters, but any above average winter would cause some winter kill. This level is above the mid-point on the growth curve and recruitment would be reduced and deer resources would start to be stressed.

## **PREFERRED ALTERNATIVE**

Alternative 2 is the preferred alternative, a deer population objective of 6,000 deer and 30 to 40 bucks per 100 does. At this level the deer population will have enough resources for most winters and should have a good recruitment rate most years. The 7,000 deer population level may be too high, putting stress on the habitat and reducing the recruitment rate. Also with the possibility of CWD in the future the deer population density should be kept as low as possible. The 5,000 deer population alternative would provide the most resources for the deer population and increase the recruitment rate, but would reduce the hunting recreation opportunity significantly. Alternative 2 is the most reasonable alternative balancing hunter demand and the requirements of the deer population.

## **MANAGEMENT IMPLICATIONS**

A limited number of antlerless deer permits will be recommended in 2003. The buck harvest will be increased also. This alternative allows deer in North Park to be managed to produce older-aged bucks for quality deer hunting. Mature bucks comprise 30% of the male deer population and buck licenses are limited to keep the buck/doe ratio over 30 bucks/100 does. If CWD becomes significant in North Park in the future the population density may need to be reduced to control the disease. At the end of five years the population objective will be reassessed. Habitat improvement projects in the bitterbrush-sagebrush areas of North Park would help increase resources for the deer population. Land management agencies and the DOW should target those areas that have wintering deer populations for habitat improvement projects. Deer in the northern areas of North Park should be radio collared to determine the extent of the migration of deer into Wyoming and into CWD areas to the east. The elk population in North Park is 40% over the population objective. Reducing the elk population is a priority and will make more resources available for deer.

## **APPENDICES**

**Letter from BLM**

**Map of Deer Activity Areas**

