

**Data Analysis Unit D-20
Coal Creek Mule Deer Management Plan
Game Management Unit 53**



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**DAU D-20 (Coal Creek)
EXECUTIVE SUMMARY
December 2007**

GMU: 53

Land Ownership: 22% Private, 68% USFS, 9% BLM, 1% State

Posthant Population: Objective 7,000 2006 Estimate 6,800 Proposed Objective 5,500-6,500

Posthant Sex Ratio: Objective 25:100 2006 Observed 31:100 Proposed Objective 30-35:100

Figure 1. D-20 Posthant Population Estimate

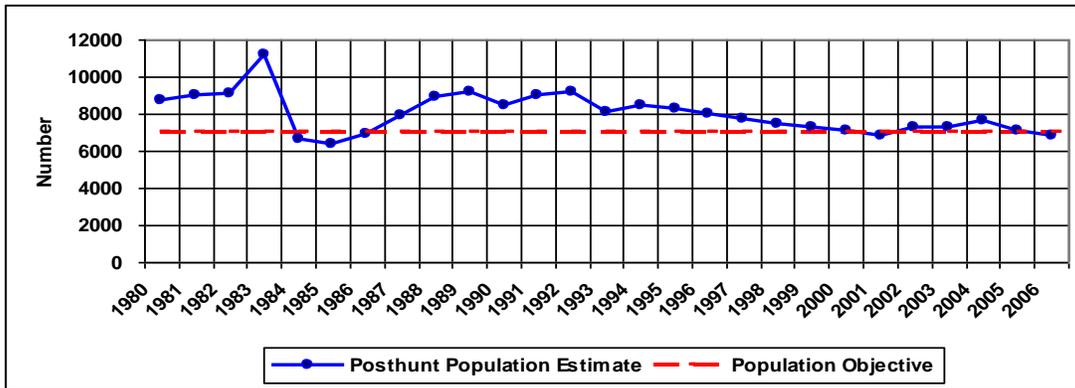


Figure 2. D-20 Harvest

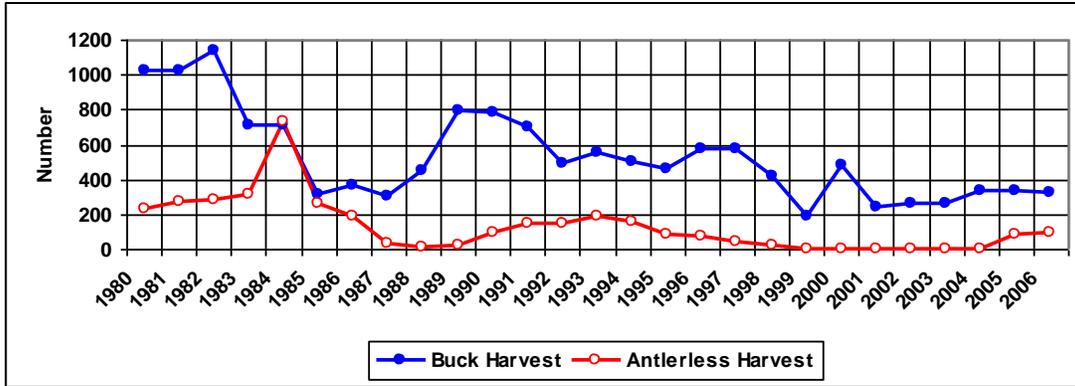
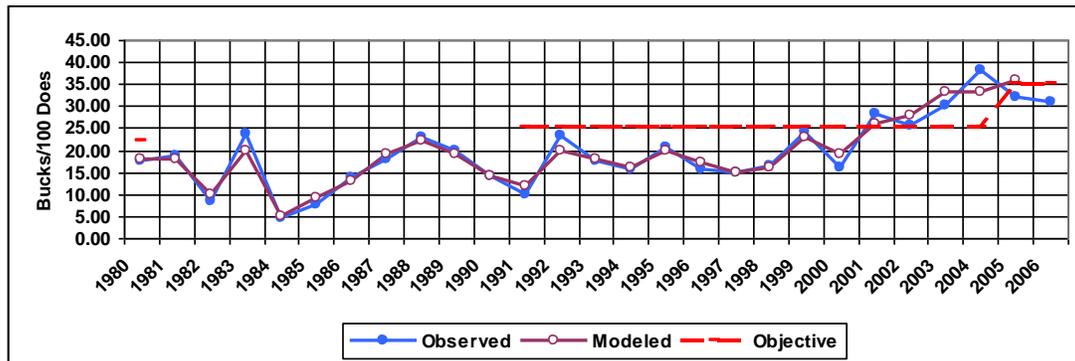


Figure 3. D-20 Posthant Sex Ratios



D-20 Background

D20 has traditionally been a popular mule deer hunting destination for resident and non-resident hunters. In 1999 deer licenses became limited in all Colorado game management units, due largely to declines in overall deer numbers, and diminishing buck:doe ratios. License allocation in D-20 has been fairly conservative since limitations went into effect and GMU 53 is becoming renowned for quality mule deer hunting.

The 2006 posthunt population estimate was approximately 6,800 animals, which is below the current objective of 7,000. During the last twenty-five years, modeled estimates indicate that the deer population in D-20 reached a high point during the early 1980's, with the current population being significantly lower. The winter of 1983-84 was severe in many places in Colorado, which resulted in substantial winter mortality and marked reductions in local deer populations. During the late 1980's and early 1990's deer numbers increased in the DAU, followed by a gradual decline that persisted until the early 2000's when license limitations and a series of mild winters promoted population growth. Sex ratios in D-20 have varied over the last twenty-five years, but have increased significantly since antlered licenses were reduced in 1999. Buck:doe ratios in the DAU reached a high in 2004 at 38:100, which was over the current sex ratio objective of 25:100, and interim objective of 35:100. From 1992 through 1998, an average of 2,335 deer hunters participated in the annual hunting seasons in GMU 53. From 1999 to 2006, following license limitations, hunter numbers have averaged around 560. In 2006, 710 antlered and antlerless licenses were available in D-20 across all seasons. Over the last eight years success rates have been around 60% with approximately 325 deer being harvested annually.

Mule deer management is of interest to many different constituents in the North Fork Valley, with issues revolving primarily around trophy hunting versus hunting opportunity, habitat condition (particularly winter range), and game damage. The CDOW held a public meeting in Hotchkiss on August 13, 2007 to discuss mule deer management, and to solicit public comment on desired future objectives. Managers received very few written or verbal comments following that public meeting; however there seems to be general support for current mule deer management prescriptions in the North Fork. Although hunter satisfaction appears to be high in this DAU, concern has been expressed with regard to the addition of a 4th season buck hunt in unit 53. Some hunters are concerned that a 4th season will remove the largest bucks in the unit, and do not view the season as fair chase. In addition to the public meeting, letters soliciting comment were also sent to local county commissioners, the North Fork HPP committee, and federal agencies. To date, no responses have been received from those entities.

It is therefore recommended, after considering the many biological and social variables in the DAU that the preferred management objectives in D-20 are:

- **Post-hunt Population Objective = 5,500-6,500**
- **Sex Ratio Objective = 30-35 bucks : 100 does**

Potential advantages:

- This management scenario will continue to provide high quality buck hunting and maintain older age classes of males.
- This management scenario will allow managers to continue harvesting antlerless deer in the DAU, which will provide additional deer hunting opportunity, and partially address game damage issues. Furthermore, public land doe licenses may be considered in future years if necessary to achieve management objectives.
- Population reduction is expected to reduce the overall utilization of key forage species throughout area winter ranges.
- This management scenario is expected to provide a desirable balance between hunt quality and opportunity.
- Success rates will likely remain high across all seasons.

Potential disadvantages:

- National publicity is expected to keep application rates high for this game management unit, and it is likely that preference points will continue to be required for all antlered licenses. Burgeoning interest in GMU 53 may result in increased preference point requirements over time.
- A reduction in the overall deer population would be anticipated over time, which some sportsmen may find displeasing.

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 mandates from the Wildlife Commission and the Colorado Legislature. Colorado's wildlife resources require careful and increasingly intensive management to accommodate the many and varied public demands and growing impacts from people. To manage the state's big game populations, the CDOW uses a "management by objectives" approach (Figure 4). Big game populations are managed to achieve population and sex ratio objectives established for Data Analysis Units (DAUs). Each DAU generally represents a geographically discrete big game population. The DAU planning process establishes herd objectives that support and accomplish the broader objectives of the CDOW's Strategic Plan.

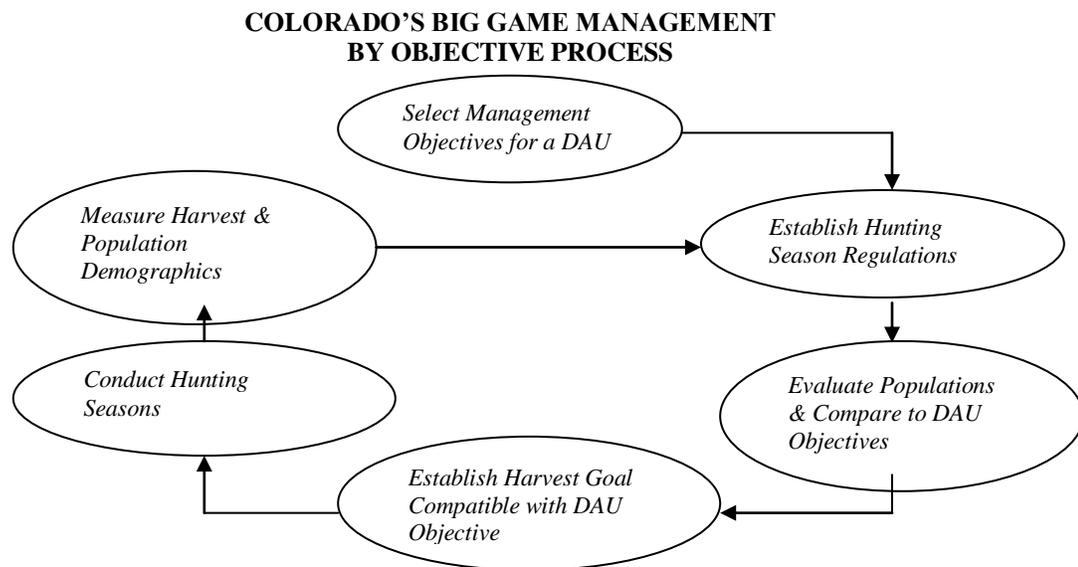


Figure 4. Management by objectives process used by the CDOW to manage big game populations on a DAU basis.

The DAU planning process incorporates public input, habitat capabilities, and herd considerations into management objectives for each of Colorado's big game herds. The general public, sportsmen, federal land management agencies, landowners, and agricultural interests are involved in determining DAU plan objectives through questionnaires, public meetings, comments on draft plans, and input to the Colorado Wildlife Commission. Limited license numbers and season recommendations result from this process.

Each DAU is managed to meet herd objectives that are established through the DAU planning process. The DAU plan establishes post-hunt herd objectives for the size and structure of the population. Once the Wildlife Commission has approved DAU objectives, they are compared with modeled population estimates. Model inputs include:

- Harvest estimates determined by hunter surveys
 - Post-hunt sex and age ratios determined by aerial classifications
 - Estimated wounding loss, illegal kill, and survival rates based on field observations and telemetry studies.

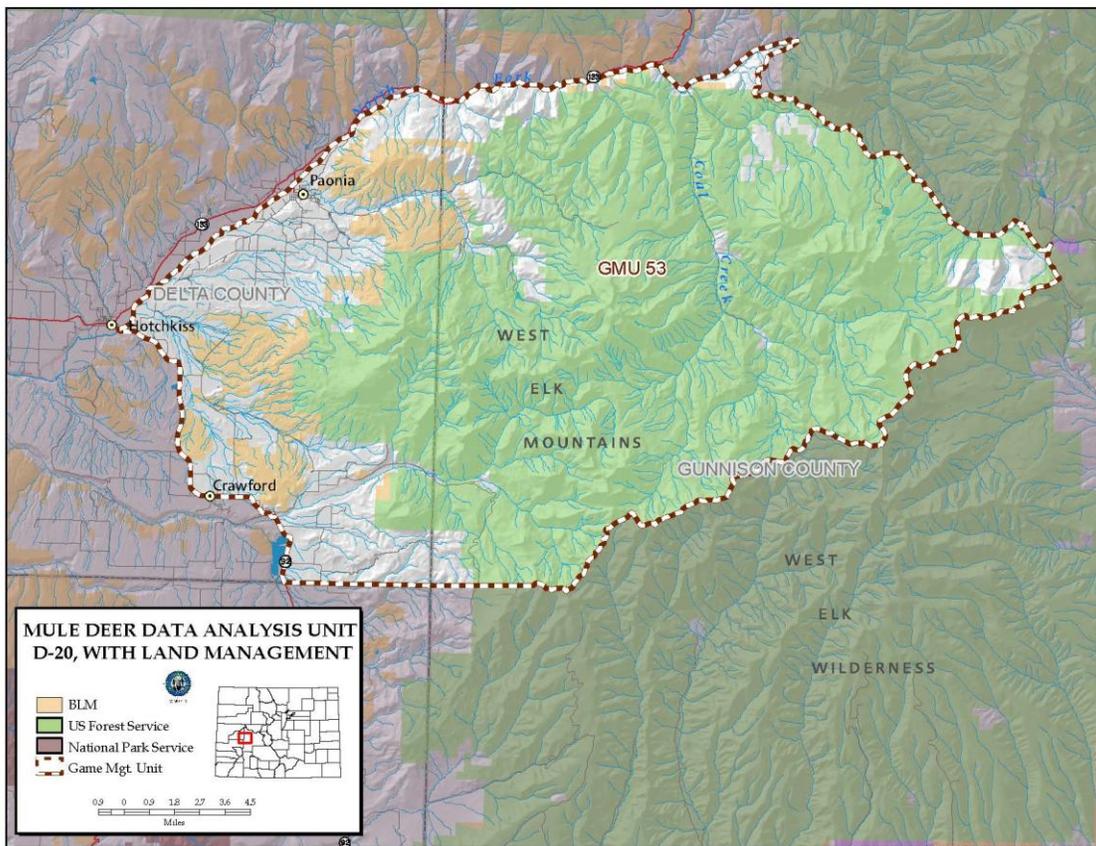
A computer model calculates the population's size and structure based on the most accurate information available at the time. The final step in the process is to calculate harvest recommendations that will align population estimates with the herd objectives.

DESCRIPTION OF DAU D-20

Location

Data Analysis Unit (DAU) D-20 is located in west-central Colorado and includes Game Management Unit (GMU) 53 (Figure 5). It is commonly referred to as the Coal Creek DAU. The unit encompasses approximately 254,000 acres and includes portions of Delta and Gunnison Counties. It is bounded on the west by Highway 92; on the north by the North Fork of the Gunnison River; on the east by Gunnison County Road 12; and on the south by the Gunnison River-North Fork Gunnison River divide and the Montrose-Delta County line. Communities adjacent to or within the DAU include Crawford, Hotchkiss, and Paonia.

Figure 5. DAU D-20



Topography/Climate

Elevations within the DAU range from approximately 5,300 ft within the town of Hotchkiss, to almost 13,000 ft at the summit of Mount Gunnison. Some of the most prominent geographic features within D-20 are found in the West Elk Wilderness Area, which takes in multiple peaks over 12,000 feet. High elevation snow-packs contribute to a number of perennial rivers and creeks, including the North Fork of the Gunnison River, and Smith Fork, Minnesota, Coal, and Cottonwood Creeks.

Elevation and season have a profound effect on climate within the DAU. Low elevation valleys in D-20 experience warmer temperatures and lower annual precipitation, while high-elevation mountainous

environments are prone to heavy snowfalls and low temperatures. The majority of annual precipitation is in the form of snow, with levels often exceeding 40 inches above 11,000 feet. Near the town of Hotchkiss, mean annual precipitation is generally around 16 inches. This diversity in topography and climate accommodates excellent year-round habitat for mule deer. Connectivity between high and low-elevation habitats within the DAU is critical, as deer move throughout the year based on snow accumulations and forage availability.

Vegetation

Plant communities are diverse in this DAU and vary depending on many factors including elevation, aspect, moisture regime, and soils. At the lowest elevations, native plant communities are typical of the high mountain desert with dominant shrub species consisting of four-wing saltbush, greasewood, and rabbit brush. A significant amount of private farmland is also present in the North Fork Valley, with irrigated hay meadows (grass & alfalfa), artificially seeded rangelands, cornfields, and orchards being common. Big sagebrush/mixed grassland, Pinyon/Juniper woodlands, and mixed mountain shrub communities (Gambel oak, service berry, mountain mahogany) are prominent at slightly higher elevations. Above the mountain shrub zone extensive stands of aspen and mixed spruce/fir forest occur below the highest-elevation alpine ecosystems which occur primarily in the West Elk Wilderness. Riparian areas along the many rivers and streams within the DAU provide important habitat for deer and other wildlife species throughout the year. Common plant species found in riparian zones include narrowleaf cottonwood, chokecherry, and a variety of willows.

Land Use

► Ownership

D-20 contains a mixture of public and private lands. Approximately 79% of the DAU is public lands with 9% managed by the BLM, 69% by the USFS, and 1% under the jurisdiction of the Colorado Division of Wildlife and the State Land Board. The remaining 21% of the land in D-20 is under private ownership that is primarily managed for agricultural production (where undeveloped). The majority of private land in the DAU is found at lower elevations within mule deer transition and winter ranges, with the largest blocks occurring in the areas between Crawford, Hotchkiss, and Paonia.

► Agriculture

Agriculture remains of considerable importance to the local communities in D-20, and is perhaps one of the oldest and most prolific land uses in the DAU both on private and public lands. Domestic sheep and cattle producers rely heavily on private and public lands for livestock forage throughout the year. A considerable amount of hay is produced on private lands during the growing season to provide winter forage for livestock herds and/or to sell on the open market. The North Fork Valley is well known for its fruit production, and privately owned orchards are prolific throughout the valley.

► Recreation

The public lands within this DAU receive a significant amount of recreation throughout the year. Many different forms of recreation occur in D-20 including hunting, hiking, camping, fishing, wildlife watching, cross-country skiing, horseback riding, shed antler hunting, mountain biking, OHV use, and snowmobiling. Recreational demand and intensity on public lands across southwest Colorado have increased over the last five to ten years. Some local resource managers and members of the public are concerned about the potential impacts to mule deer from recreational activity. Fragmentation of habitats and displacement of deer into suboptimal habitats or on to private lands are the chief concerns, particularly within limited winter range areas.

► Energy Development

Natural gas exploration and production are emergent land uses in the North Fork Valley. Lands included in GMU 53 encompass portions of the southern Piceance gas-producing basin. The Grand Mesa-Uncompahgre-Gunnison National Forest (GMUG) first authorized development of oil and gas leases in the early 1980's. In October of 2006, approximately 146,000 acres of the GMUG were under lease for oil and gas development, with an additional 260,000 acres nominated for lease (http://www.fs.fed.us/r2/gmug/policy/plan_rev/proposed/Plan_4_web/Appendix_I_National_Energy_Policy.pdf, 2007). In GMU

53, active and pending leases occur south of Somerset, and north of the town of Crawford. The Bureau of

Land Management's (BLM) "Reasonable Foreseeable Development Scenario", forecasted 88 new gas wells over the next 15 years on the GMUG (Fowler and Gallagher, 2006). Natural gas extraction requires considerable development including roads, well pads, and pipelines, and increases human activity within the developed area. At present, it is unknown whether or not this development will have lasting impacts on the D-20 mule deer population. Habitat loss, fragmentation, disturbance, and displacement into less suitable habitats are of chief concern to wildlife managers with regard to natural gas development.

► ***Coal Mining***

There are several coal mines in operation in and adjacent to D-20. Some of the most productive coal mines in the United States are present outside of the towns of Somerset and Bowie on the northern boundary of the DAU. More than 16.5 million tons of coal were produced from mines located in Montrose, Delta, and Gunnison counties in 2003 (<http://www.energybulletin.net/277.html>). Open pit mining does not generally occur in the North Fork area, with underground longwall mining being the most common method of coal extraction. Above ground impacts from mining generally consist of the development of utility road networks, and construction of degasification well pads above mines that are in operation.

HERD MANAGEMENT HISTORY

The Coal Creek DAU contains large expanses of mule deer habitat of varying quality. It is likely that deer populations in the area were regulated historically by habitat conditions and related climatic variables such as winter severity and drought. Predation by large carnivores, such as the gray wolf may have also limited population growth under certain circumstances. More recently, there are a host of factors believed to be exerting influence over mule deer population dynamics throughout the west. These factors have included competition with burgeoning elk populations, fire suppression & plant succession, drought, over hunting, noxious weed proliferation, human development/habitat fragmentation, and predation. Mild winters and limited hunting pressure have recently contributed to mule deer population increases in many areas of western Colorado, including D-20.

D-20 Management Summary

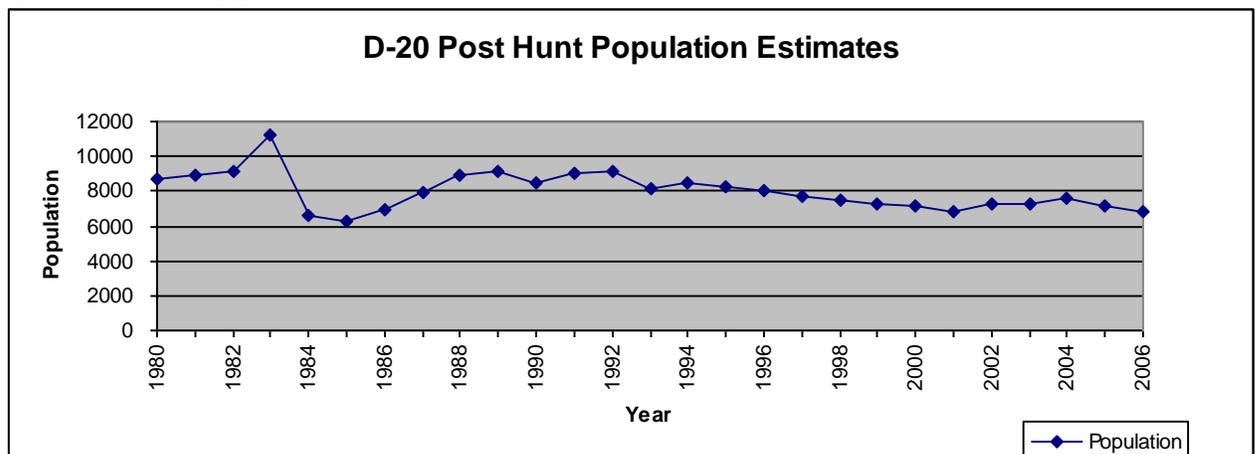
Estimating population numbers of wild animals over large geographic areas is an inexact science. Whenever attempts have been made to account for a known number of animals in large fenced enclosures, investigators have consistently failed to see every animal. In some cases, less than 50% of the animals have been observed. High-tech methods using remote sensing have also met with very limited success. Most population estimates derived using computer model simulations involve estimations of sex ratio at birth, survival rates, wounding loss and annual production. These simulations are then adjusted to align on measured post-hunt age and sex ratio data, or in some instances density estimates derived from line-transect or quadrat surveys. The Division of Wildlife recognizes population estimation as a serious limitation in our management efforts and attempts to minimize this problem by using the latest technology and inventory methodology available. As better information is obtained on survival rates, wounding loss, fetal sex ratios and density estimates, and whenever new modeling techniques and programs have emerged, these have been assimilated into the process for estimating populations. These changes may result in significant differences in the population size estimate and make new management strategies more appropriate. It is recommended that the population estimates presented in this document not be viewed as an exact representation of the number of animals in the DAU; instead, their utility is in helping to evaluate population trends over time.

The CDOW has traditionally used *post-hunt* population information to assess annual trends in overall numbers and sex and age composition. All data presented in this DAU plan, other than harvest, is derived from post-season classification flights and modeling sessions. Post season flights are conducted in order to classify a representative sample of the overall population and should not be misinterpreted as an all-inclusive population "count".

Post-hunt Population Size

Population objectives are generally established based on a variety of different biological and social variables. These often include the productivity and condition of animal and plant communities, agricultural and private land concerns, local economics, and hunting opportunity. The deer population in D-20 has fluctuated over the last twenty years (Figure 6). Model estimates indicate that a peak occurred during the early 1980's, which was followed by a general decline over time until about 2000 when the population began a stable to increasing trend. The historic population decline appeared to be precipitated by the severe winter of 1983-84, which may have also resulted in diminished habitat capability due to overuse in key winter range areas. Recent population increases in the DAU are likely the result of two primary factors. One is the limited license program the CDOW initiated in 1999 which resulted in an increase in the number of buck deer present in the population following annual hunting seasons. And perhaps of greater significance was a series of relatively mild winters that occurred from approximately 2001 through 2005. Reducing the number of antlered hunting licenses, and the addition of private land antlerless licenses over the last two years has maintained the stable/increasing trend for this population. The post-season 2006 population estimate for D-20 is approximately 6,800 animals, while the current DAU plan objective is set at 7,000.

Figure 6. D-20 Post hunt population estimates 1980-2006



Post-hunt Herd Composition

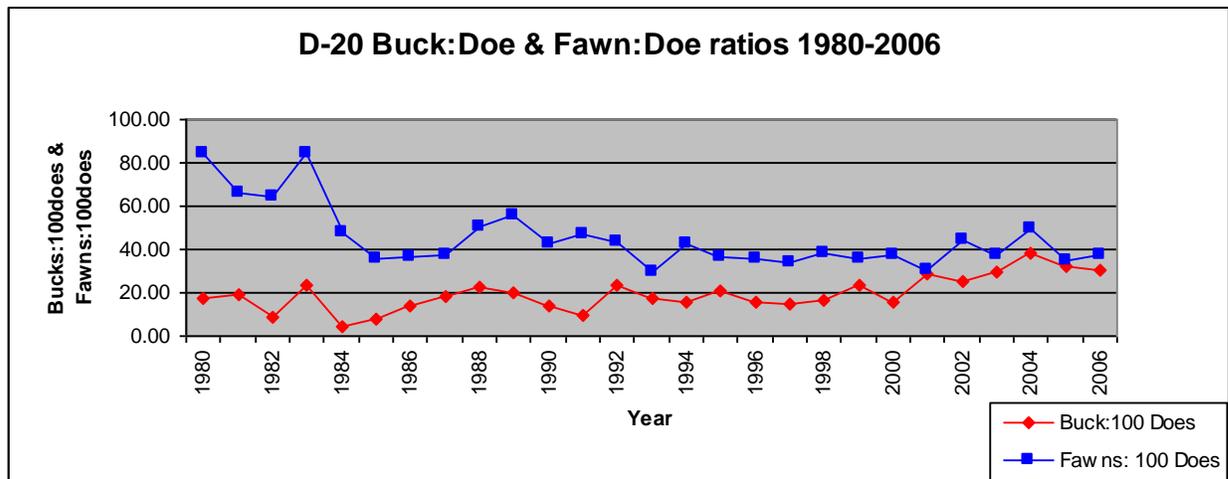
Sex Ratio (buck:doe)

When mule deer licenses became limited statewide, a variety of management strategies were implemented across the state. For the Coal Creek population, license numbers were reduced by approximately 50% from the previous three-year average. Following those reductions, post-season observed buck:doe ratios have increased significantly (Figure 7). The highest post-season buck:doe ratio observed in the unit occurred in 2004, with 38 bucks per 100 does. This ratio was up substantially from the previous three year average of 28:100. The lowest buck:doe ratio observed in the DAU occurred post-hunt 1984 with 4 bucks per 100 does. The current interim sex ratio objective for this DAU is 35 bucks per 100 does. In 2005, based largely on high hunter satisfaction and the understanding that DAU plan revisions were pending, wildlife managers set an interim sex ratio objective of 35 bucks:100 does. The official sex ratio objective for D-20 is 25:100. A key element of this DAU plan is whether or not the interim objective remains desirable. Increasing the sex ratio in the DAU will likely require more conservative license allocation which equates to more limited hunting opportunity. Conversely, decreasing the sex ratio objective will provide additional hunting opportunity.

Age Ratio (fawn:doe)

Fawn to doe ratios have varied considerably in D-20 over the last 25 years. The 2006 observed fawn:doe ratio was approximately 37:100. Age ratio trends are of interest to wildlife managers as they can be indicative of population performance and productivity. However, managing for a desired age ratio on an annual basis is unrealistic due to the tremendous variability in annual natality and mortality rates. Recruitment of fawns into the breeding population is critical for population maintenance, but changes in population size may be influenced by many factors including age & sex specific survival rates, reproductive rates, and climatic and habitat conditions. Over the last 10 years, fawn:doe ratios in this DAU have averaged around 38:100. This seemingly low age ratio may be indicative of density dependence, and may suggest that habitat capability has diminished over time within the DAU. Figure 7 shows changes in fawn:doe ratios since 1980.

Figure 7. D-20 sex and age ratios 1980-2006



Hunter/Harvest History

Game Management Unit 53 has always been a popular mule deer hunting destination for resident and non-resident hunters. Management strategies have varied over the years, and have included antler point restrictions, separate and combined deer and elk seasons, and conservative three and five day buck deer seasons (1992-1994 & 1995-1999 respectively). Antlered mule deer licenses for this unit were traditionally available “over the counter” and sold on an unlimited basis. Antlerless licenses were also issued annually on a limited basis prior to 1999. In 1999, mule deer licenses became limited statewide and license reductions occurred in D-20. It was decided at the time that deer populations across much of Colorado had fallen below population and buck:doe ratio objectives. Thus, antlerless licenses were abolished in the unit, and antlered licenses were reduced by approximately 50% of the previous three-year average. Private land only doe licenses have been issued on a limited basis since 2005.

Hunter Trends-

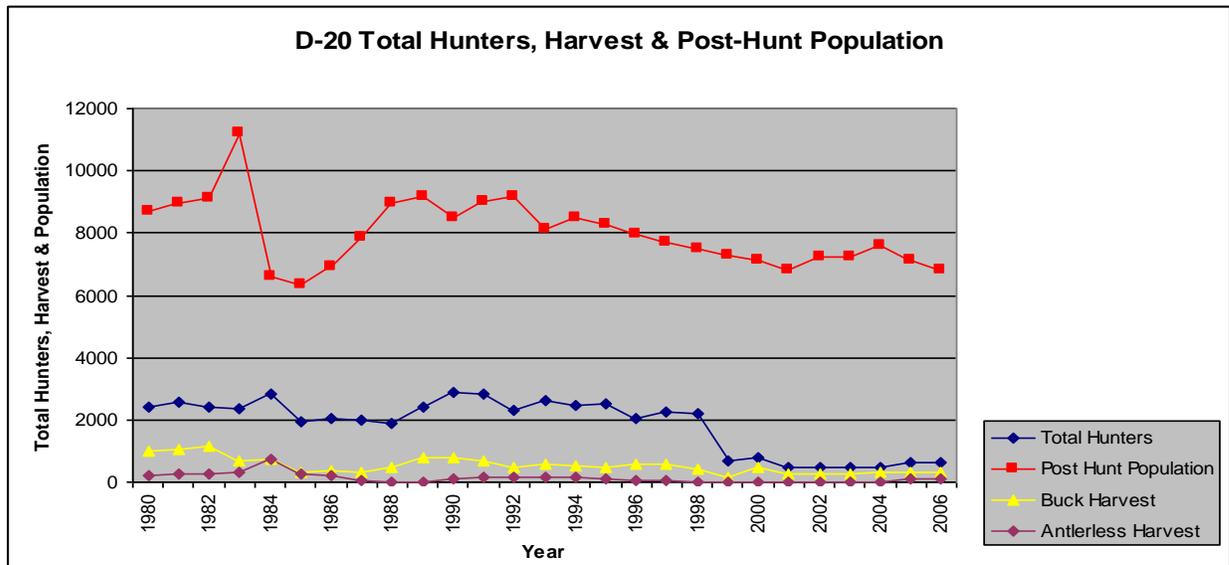
Between 1992 and 1998, the average number of deer hunters pursuing deer in GMU 53 was approximately 2,335. The average number of hunters in D-20 between 1999 and 2006 was estimated to be around 560. The highest estimated number of hunters in the DAU was documented in 1990 at nearly 2,900. The lowest number of hunters recorded in the DAU was 446 during the 2002 seasons. In 2006, an estimated 621 hunters participated in the mule deer hunting seasons in D-20. Figure 8 shows changes in hunter numbers between 1980 and 2006.

Harvest Trends-

The average buck harvest from 1992 through 1998 was 510, with the total harvest averaging 612 animals. Between 1999 and 2006, the average buck harvest was 302, with a total harvest of 325. Figure 8 illustrates the highest documented harvest in the DAU occurred in 1984 with 1,442 deer harvested, including 710 bucks. The largest antlered harvest in the DAU occurred in 1982 with 1,137 bucks harvested. The lowest annual harvest took place in 1999, with a total of 183 antlered deer taken. Success rates have varied since

1980, but have averaged around 60% since 1999 across all seasons. In 2006, an estimated 419 deer were taken by 621 hunters, which included 99 antlerless and 320 antlered animals.

Figure 8. Total hunters, harvest, and post-hunt population estimates 1980-2006.



CURRENT MANAGEMENT STATUS

Under current five-year season structure constraints set by the Colorado Wildlife Commission, mule deer hunts in D-20 begin in late August and extend through November. All seasons run concurrently with the regular elk hunting seasons. In addition to the archery and muzzleloader seasons, there are two rifle hunts in the unit which begin in late October and end by mid-November. Recent interest has been expressed for an additional rifle season that would occur during the 4th combined season. These mid-November buck hunts are highly sought after, and may be adopted throughout the Southwest Region in the fall of 2008. In Colorado, there are no regulatory antler point restrictions, and a legal buck is at a minimum required to have spike antlers equal to or greater than five inches long. Any doe or fawn may be harvested by hunters with valid antlerless licenses.

Doe Harvest-

Antlerless licenses were not issued in the DAU between 1999 and 2004 in an attempt to expedite population increase following statewide license limitations. Reduced hunter harvest and a series of mild winters occurred during this time period and the deer population began to increase. Because landowners were becoming increasingly concerned with “resident” herds of deer causing damage to crops, local wildlife managers recommended the institution of private land only antlerless hunts in game management units throughout the North Fork Valley. These licenses have been issued annually since 2005 and will continue to be issued until population objectives are reestablished and subsequently achieved. Those hunts take place from September through the end of October and are intended to target non-migratory, resident populations of animals. In 2006, 150 PLO antlerless licenses were issued for GMU 53(Figure 9).

Buck Harvest-

The number of buck licenses in the DAU decreased between 1999 and 2001, but has stayed fairly constant since that time. In 1999, a total of 1,075 antlered licenses were issued, compared to the 560 buck licenses issued in 2006. The large license decrease that occurred in 2001 was based on post-season classification data (Figure 10), which indicated that the number of buck licenses issued was resulting in lower than desired buck:doe ratios, and the fact that the unit was undersubscribed in 2000.

Figure 9. Antlered and Antlerless licenses issued 1999-2006

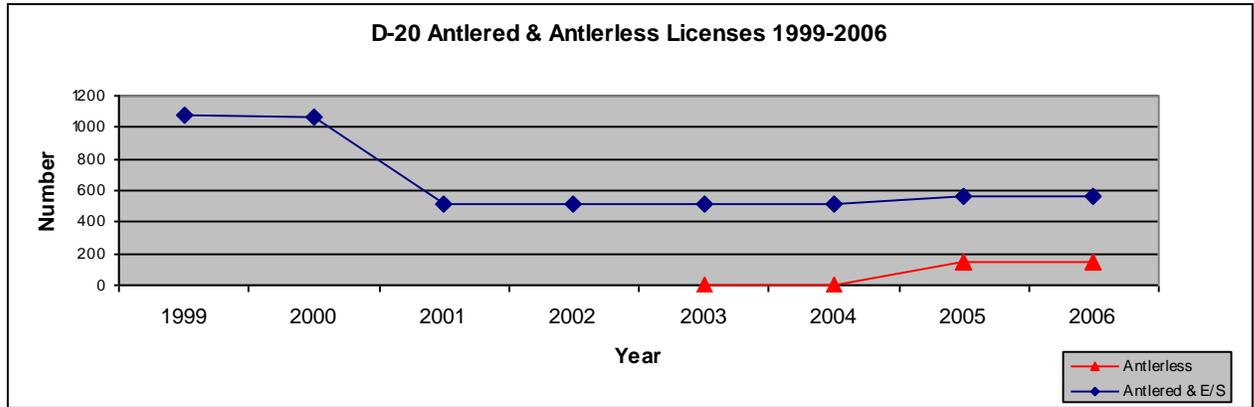
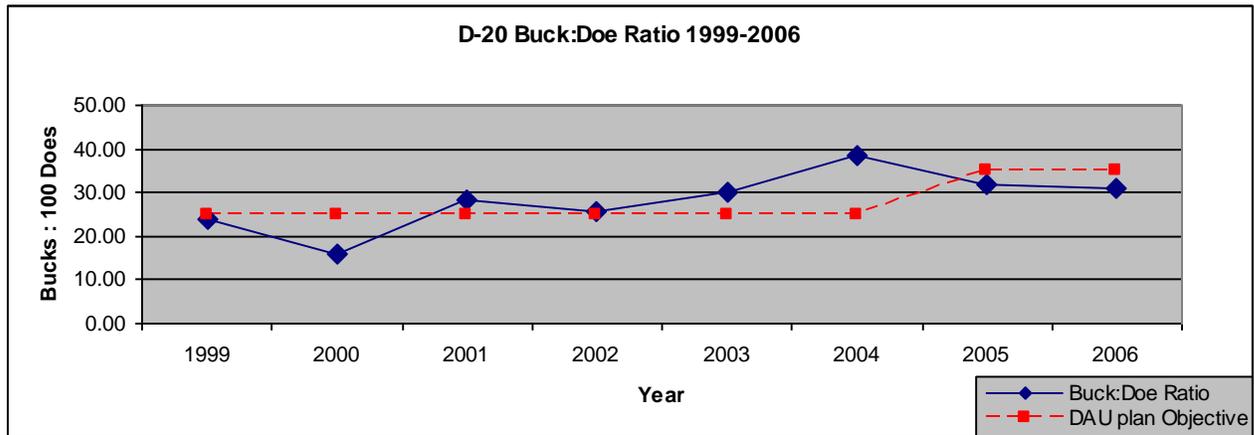


Figure 10. Observed Buck:Doe ratios vs. Objectives 1999-2006



KEY ISSUES

There are many issues associated with mule deer management in this DAU which generally fall into either a biological or social/political category. Certain issues have been raised during this planning process that appear central to discussions pertaining to management in D-20.

Quality Management-

The concept of managing big game populations for “quality” hunting has generated considerable discussion during recent years, and hunters clearly disagree on the definition of quality. To some hunters, quality is synonymous with trophy antler size and the opportunity to see numerous trophy class animals over the course of a hunt. Others perceive quality as being in the field with reduced hunter crowding, and having the opportunity to see undisturbed animals on a regular basis. There are also hunters that consider a week in the woods with friends and family a quality hunt, regardless of whether they see animals while hunting. Some interest has been expressed during this process to increase the number of mature bucks present in the DAU in order to increase the “quality” of the unit.

Hunter Opportunity-

A key element of big game management is often the public’s desired level of hunting opportunity. Some hunters prefer to hunt every year, whereas others would wait five or more years in order to hunt in a highly

sought after unit. Some hunters forego multiple years of hunting in order to build preference points, while others are willing to buy expensive landowner vouchers in order to hunt every year. Trophy mule deer bucks are probably one of the most sought after big game animals in the western United States, and hunters are continuously seeking opportunities to hunt trophy deer. Technological and societal changes over the last ten years (ie. internet, hunting media, hunting consultants) have led to an environment where hunting “hot-spots” may be quickly disseminated to the hunting community. Many hunters now apply for licenses in multiple states each year and the demand for highly sought after permits has increased markedly. The level of hunting opportunity will ultimately be dictated by the objectives set in this DAU plan.

Habitat Condition / Winter Range

Like many places in the Rocky Mountain west, spring and summer ranges in D-20 are much more expansive than the limited winter range. Many winter range areas occur many miles from summer range and can only be reached following lengthy migrations. Winter ranges in D-20 often occur in low elevation areas where ex-urban development and agricultural lands are present. The quantity and quality of winter range clearly presents a potential bottleneck for herd productivity and sustainability. In D-20 mule deer typically begin concentrating on winter ranges during late October or early November where they will remain until the following May. Winter ranges in unit 53 consist of agricultural lands, oak-dominated mountain shrub lands, and large expanses of pinyon-juniper interspersed with sagebrush parks. Winter ranges in the area generally receive lower annual precipitation than higher elevation sites and contain less productive soil types. These conditions result in systems that are slow to recover from excessive herbivory and/or climatic stress. Over-utilization of browse species is apparent in many winter range areas in D-20, which has led to concern about the long-term sustainability of local big game populations. It is reasonable to assume that a reduction in the quantity and quality of winter range forage across the landscape will ultimately result in declining productivity for local mule deer herds. There are many factors influencing mule deer winter range in this DAU. Noxious weed proliferation, plant succession (particularly expansion of pinyon-juniper and oak), human development, climate, habitat fragmentation, and competition for forage with elk and domestic livestock are all potentially influencing mule deer winter habitat. Continued management and preservation of key winter ranges by federal land management agencies, North Fork HPP committee, and the Colorado Division of Wildlife is essential for promoting healthy mule deer populations in this DAU. Reducing the total number of deer in this DAU is expected to yield some improvements in winter range plant condition.

Caution is recommended before concluding that reduced herbivory equates to an immediate increase in vigor and production of plants on winter ranges. Although some areas may receive temporary relief, smaller populations of wild ungulates may still cause localized degradation within winter concentration areas. In the absence of disturbance (ie, fire, etc.) many decadent shrub, aspen, and pinyon-juniper communities may continue to be unproductive, and remain of lesser value to wintering big game animals and other mountain-shrub/sagebrush dependent species. A mosaic of disturbed and undisturbed (ie. varying age and condition classes) sites across the landscape would be expected to enhance plant condition while improving wildlife distribution and grazing/browsing intensity.

Human Development

Human development in D-20 continues to increase, with some estimates indicating that Montrose and Delta Counties have experienced growth rates of 5-10% over the last five years. In addition to primary residential development and enhanced infrastructure, the North Fork Valley, like many places in the Rocky Mountain west has become a favored location for second home owners and retirees. Considerable development has occurred in the areas between Delta, Paonia, and Crawford, and in recent years the area has been referred to as “The Golden Triangle” by people looking for a scenic place to move with a favorable year-round climate. Much of this development has taken place on transition and winter ranges, which is of concern to wildlife managers. Loss of habitat or fragmentation of habitat due to human development may become a detriment to mule deer populations in this DAU. Participation in land use planning processes, working cooperatively with local landowners, and opportunistically acquiring conservation easements should remain priorities for local resource agencies. Preservation and enhancement of remaining critical winter range is essential.

Elk

The Division of Wildlife will continue to manage area elk herds for DAU plan objectives, and recognizes that the number of elk maintained within the unit will have some influence over sympatric mule deer populations.

Game Damage

Game damage has historically been an issue in the North Fork valley. Over the last 25 years, exclusionary fencing, habitat treatments, HPP mitigation, damage/dispersal hunts, and formal game damage compensation have all been used as means for addressing damage issues. Recent increases in the mule deer population in D20 have led to concern from some landowners, specifically with regard to fence, forage, and orchard damage on private lands within the unit. PLO doe hunts in GMU 53 have been received favorably in recent years and will continue to be used as a management tool. The North Fork HPP committee has also been successful in fostering landowner relations and improving damage situations, and will continue to work on mitigating or resolving damage situations.

Energy Development

The Division of Wildlife will continue to participate in land use planning relevant to natural gas development. Whenever possible, negative impacts to mule deer resulting from natural gas development should be mitigated or avoided.

Chronic Wasting Disease (CWD)

Chronic wasting disease is a neurological disease occurring in members of the cervid family, which includes mule deer. CWD has been of concern to wildlife managers from both a herd health and human health standpoint. For mule deer, issues such as population density, supplemental feeding, and sex and age specific prevalence rates are important when discussing Chronic Wasting Disease. There have not been any documented cases of CWD within this DAU, however there have been three cases of CWD detected on the adjacent Grand Mesa (1 mule deer in GMU 521, 1 mule deer in GMU 421, and one elk in GMU 521). The Colorado Division of Wildlife will continue to test voluntary submissions from hunter harvested mule deer from this and surrounding DAU's. If Chronic Wasting Disease prevalence appears to be increasing, managers may need to reevaluate management objectives if they are deemed incompatible with CWD risks.

PUBLIC INVOLVEMENT / ALTERNATIVE SELECTION

Big game issues throughout Colorado are always of interest to local constituents both from a socio-economic and biological standpoint. Therefore, the Division of Wildlife provided the public and agency personnel with various opportunities to be involved in this DAU planning process.

Chronology:

July 20, 2007: Letters were sent to various constituents outlining the DAU process and requesting attendance at a public meeting to be held in mid-August. The mailing also solicited formal comments pertaining to mule deer management in D-20. Those letters were sent to the Montrose, Delta, and Gunnison County Commissioners, USFS Paonia Ranger District, USFS Gunnison Ranger District, Montrose BLM Field Office, and the North Fork HPP Committee.

Weeks of August 6th: Advertisements were run in area newspapers for the August public meeting; that meeting was also publicized on the Division of Wildlife's website.

August 13, 2007: Public meeting was held in Hotchkiss to discuss the DAU planning process, mule deer management issues, and solicit public comment. Approximately 15 people attended that meeting. In order to facilitate public comment, a concise comment form pertinent to local mule deer management was developed and made available. Respondents were asked to return comment forms by August 31, 2007 so that the results could be incorporated into draft management plans.

December 2007: Draft DAU plans submitted to the Colorado Wildlife Commission.

Constituent Response

No comments were received from the entities listed above that were solicited for comment in July. Only four response letters were received following the public meeting. The theme of all four letters was the same: respondents wanted to see more deer overall, higher buck:doe ratios, and did not support the 4th

season buck hunt.

Objective Alternatives

This section includes some of the potential alternatives for managing the D-20 mule deer herd. For DAU planning, there are logically three general alternatives available with some variation. The alternatives selected will determine the total population and sex/age objectives, and subsequently the number of licenses issued in a GMU. These basic alternatives include status quo (no change or minor change), increased population and/or sex ratio objectives, or decreased population and/or sex ratio objectives. Some alternatives are presented in Table 3. Population & buck:doe ratio objectives for this DAU plan will be set as a range rather than a fixed number. Setting an objective range recognizes that population modeling is a continuously evolving, inexact science, but more importantly, a range allows greater flexibility on an annual basis for management actions in a DAU. Although there are important relationships between the buck:doe ratio selected and the total population objective, they can be viewed as independent variables. In Table 3, “Alternative 1” for population does not directly correspond to “Alternative 1” for the Buck:Doe ratio.

Table 3. D-20 Population & Buck:DoeRatio Alternatives

Possible Alternatives for D-20 Population & Buck:Doe Ratio Objectives		
Population Alternatives	Post-hunt Population	2006 Post-hunt Estimate = 6,800
<i>Alternative 1</i>	≤ 6000	
<i>Alternative 2</i>	6000-7000	
<i>Alternative 3</i>	7000-8000	
<i>Alternative 4</i>	≥ 8000	
Sex Ratio Alternatives	Bucks:100 Does	2006 Post-hunt Estimate = 31:100
<i>Alternative 1</i>	20-25:100	
<i>Alternative 2</i>	25-30:100	
<i>Alternative 3</i>	30-35:100	
<i>Alternative 4</i>	≥ 35:100	

Preferred Management Recommendation

After considering the many biological and social variables in the DAU that the preferred management objectives in D-20 are:

- **Post-hunt Population Objective = 5,500-6,500**
- **Sex Ratio Objective = 30-35 bucks : 100 does**

Potential advantages:

- This management scenario will continue to provide high quality buck hunting and maintain older age classes of males.
- This management scenario will allow managers to continue harvesting antlerless deer in the DAU, which will provide additional deer hunting opportunity, and partially address game damage issues. Furthermore, public land doe licenses may be considered in future years if necessary to achieve management objectives.
- Population reduction is expected to reduce the overall utilization of key forage species throughout area winter ranges.
- This management scenario is expected to provide a desirable balance between hunt quality and opportunity.
- Success rates will likely remain high across all seasons.

Potential disadvantages:

- National publicity is expected to keep application rates high for this game management unit, and it is likely that preference points will continue to be required for all antlered licenses. Burgeoning interest in GMU 53 may result in increased preference point requirements over time.
- A reduction in the overall deer population would be anticipated over time, which some sportsmen may find displeasing.

Implementation:

Final DAU plans, approved by the Colorado Wildlife Commission, will be in place for the 2008 license setting process. Local managers plan on phasing in updated management objectives over the next few years, based on careful examination of the most current biological information.

Literature Cited

- Bain, Ron. "US: Western Slope Coal Production Enters Age." Energy Bulletin. 16 May 2004 <http://www.energybulletin.net/277.html>.
- Fowler, B. and P. Gallagher. 2006. Oil and Gas Potential and Reasonable Foreseeable Development (RFD) Scenarios in the Grand Mesa, Uncompahgre, and Gunnison (GMUG) National Forests, Colorado.
- Proposed Land Management Plan, Appendix I Considerations of National Energy Policy. March 2007. http://www.fs.fed.us/r2/gmug/policy/plan_rev/proposed/Plan_4_web/Appendix_I_National_Energy_Policy.pdf