

**Southern San Luis Valley Pronghorn Herd
Data Analysis Unit PH-16
Game Management Units 80, 81, and 83
March 2008**

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Approved by the Colorado Wildlife Commission March 2008

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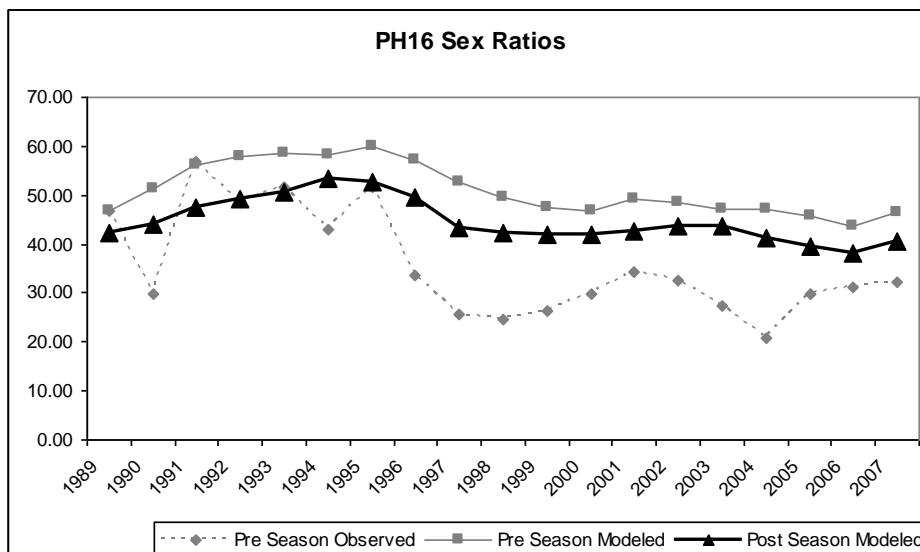
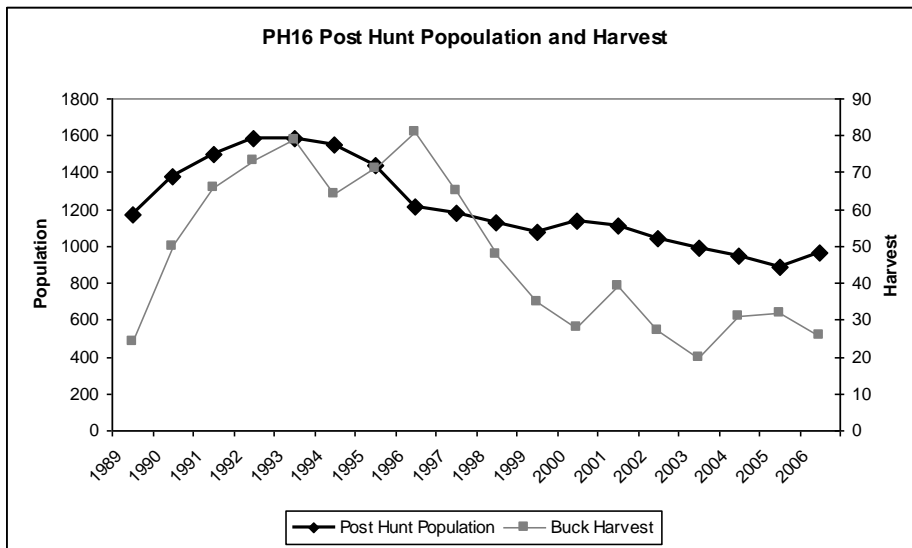
Executive Summary

Game Management Units 80, 81, and 83

Post Season Population: 2006 Estimate 1000
Current Objective 1000 to 1500

Post Season Sex Ratio: 2006 modeled 38.0
Current Objective 27 to 33

Land Ownership: 58% Private, 26% USFS, 11% BLM, 1% NWR, 4% State



This Data Analysis Unit (DAU) plan will merge three pronghorn DAUs. Previously these herds were managed under DAU A16 (GMU 80), DAU A17 (GMU 81), and DAU A28 (GMU 83). The area encompassed by this plan is the southern portion of the San Luis Valley with Hwy 160 and Alamosa/Costilla county line as the north boundary.

The post season population in the proposed DAU reached a peak of nearly 1600 (estimated) animals in 1992. Since that time the population has decreased to its current size of around 1000. Poor recruitment has been the secondary cause of the decline with the primary factor unknown. In 2002 during extreme drought pre season observed fawn ratios reached a low of 16.3 fawns:100 does. It appears that the population has reached a low point and is expected to remain stable or increase over the next several years. Prehunt age ratios for 2007 were 49.3 fawns:100 does, the highest since 1992.

Sex ratios began declining around the same time as the population decline (1993) but have remained fairly stable over the past 10 years. Modeled post season sex ratios are currently at 38 bucks:100 does. The sex ratio objectives for A16 and A17 were 35 bucks:100 does and 40 bucks:100 does respectively.

Harvest in the DAU is most influenced by the ability to acquire a license as is typical with pronghorn. Buck licenses are available on a limited basis and in high demand with minimum of 8 preference points required for a resident hunter to potentially draw a license in GMUs 80 and 81. GMU 83 only has PLO buck license since most of the unit is privately owned and these licenses require 4 preference points. Currently there are not any doe licenses available. Hunters have enjoyed recent success rates averaging 69% for the past three years.

The two biggest factors limiting this population are limited water on the overall range and winter range habitat. Areas that have available water and succulent vegetation such as Mogote Peak and center pivot irrigated alfalfa fields have experience good reproduction rates. Those areas that are more arid have seen poor recruitment especially during the peak of the drought in 2002. Availability of winter range continues to dissipate with the increased number of homes on private land and competition with domestic live stock.

Management Alternatives

Three alternatives for PH-16 are being considered for the post season population size and sex ratio objectives.

Population Objective Alternatives:

- 1) 500 to 1000 (15% decrease in current population)
- 2) 1000 to 1500 (current population)
- 3) 1500 to 2000 (15% increase in current population)

Sex Ratio Objective Alternatives:

- 1) 22 to 27 bucks: 100 does
- 2) 27 to 33 bucks: 100 does
- 3) 35 to 40 bucks: 100 does

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1. DAU Plans and Wildlife Management by Objectives

The growing human demand for a finite wildlife resource dictates wise management of Colorado's resources. The Colorado Division of Wildlife (DOW) employs a management by objectives approach to big game populations (Figure 1). The DOW's Long Range Plan provides direction and broad objectives for the DOW to meet a system of policies, objectives and management plans such as the Data Analysis Unit Plan. It also directs the actions the DOW takes to meet the legislative and Wildlife Commission mandates.

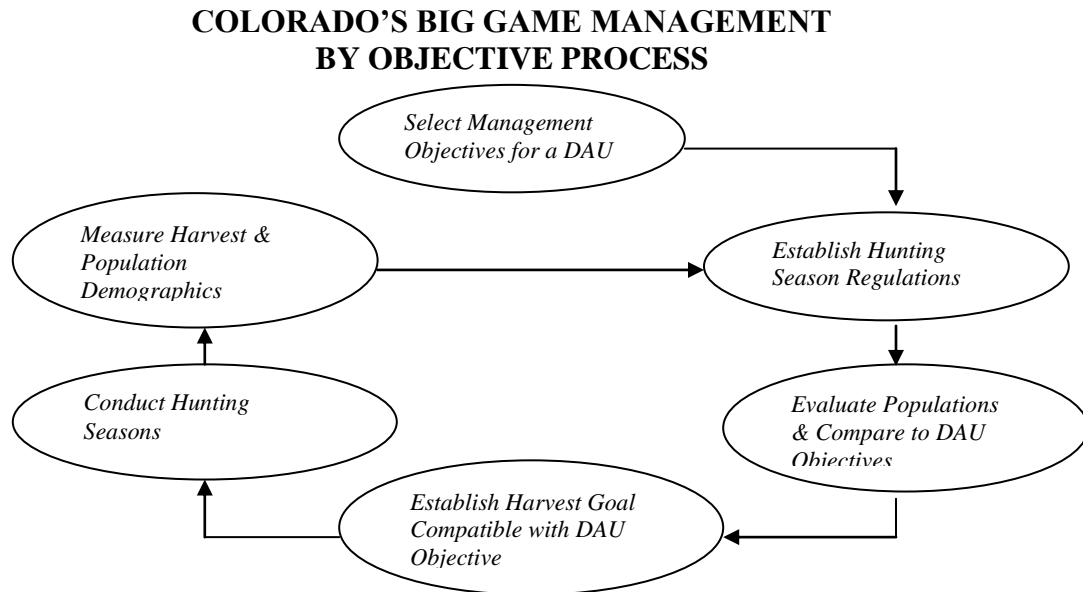


Figure 1. Management by objectives process used by the CDOW to manage big game populations on a DAU basis.

Data analysis units (DAUs) are used to manage herds of big game animals. The DAUs are generally geographically discrete big game populations. The Data Analysis Unit Plans are designed to support and accomplish the objective of the Long Range Plan and meet the public's objectives for big game. The DAU Plan establishes the short and long term herd objectives. The objective approach is the guiding direction to a long term cycle of information collection, information analysis, and decision making. One of the products of this process is hunting seasons for big game.

The DAU Plan process is designed to incorporate public demands, habitat capabilities, and herd capabilities into a management scheme for the big game herds. The public, sportsmen, federal land management agencies, landowners, and agricultural interests are involved in the determination of the plan objectives through goals, public meetings, comments on draft plans, and the Colorado Wildlife Commission.

Individual DAUs are managed with the goal of meeting the herd objectives. This is done by gathering data and then inputting it into population models to get a population estimate. The parameters used in the model include harvest data which is tabulated from hunter surveys, sex and age composition of the herd which is acquired by aerial inventories, and mortality factors such as wounding loss and winter severity which are generally acquired from field observations. Once these variables are entered into the population models a population estimate is obtained. The resultant computer population projection is compared to the herd objective, and a harvest calculated to align the population with the herd objective.

2. Description of the Data Analysis Unit

This plan will merge three pronghorn DAUs. Previously these herds were managed under DAU A16 (GMU 80), DAU A17 (GMU 81), and DAU A28 (GMU 83).

2.1 Location

The DAU for the Southern San Luis Valley pronghorn herd is in south central Colorado, on the South side of the San Luis Valley. It consists of Game Management Units (GMUs) 80, 81, and 83 (Figure 2). It encompasses portions of Rio Grande, Conejos, Costilla, Alamosa, Archuleta, and Mineral counties although no pronghorn are currently found in the Archuleta or Mineral County portion of the DAU. There are historic reports of pronghorn in Mineral County.

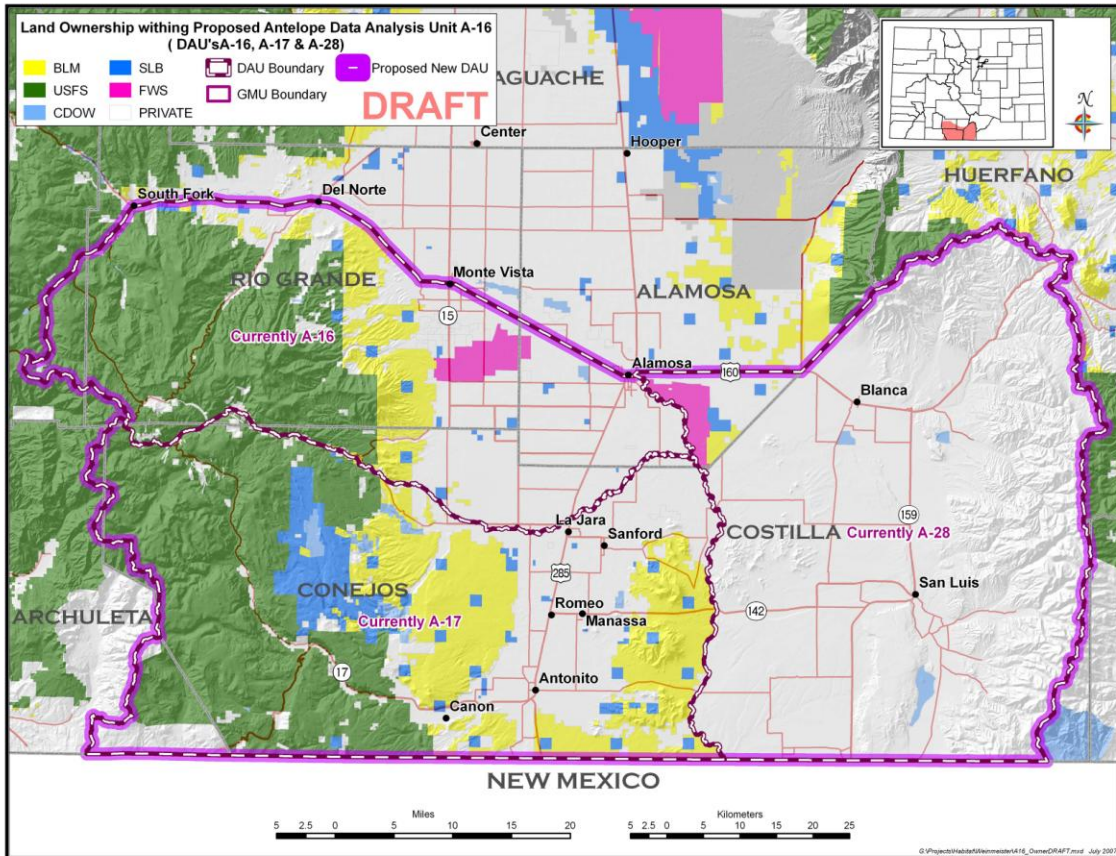


Figure 2. DAU map with landownership

The DAU is bonded by US Highway 160 and Costilla-Alamosa county line on the north, the continental divide to the west, the Colorado-New Mexico state line on the south, and the crest of the Sangre de Cristo and Culebra Mountains on the east.

The DAU is 3351 square miles with an overall pronghorn range of 1138 square miles. The Dominant geographical features are the Sangre de Cristo and Culebra ranges which rise to over 14,000 feet to the east, the San Juan Mountains at over 13,000 feet to the west and the Rio Grande and Rio Grande Canyon at 7500 feet elevation. The main drainages in the DAU are the Rio Grande, Pinos Creek, San Francisco Creek, Rock Creek, Alamosa River, Conejos River, La Jara Creek, Culebra Creek, Ute Creek, Rito Seco, and Trinchera Creek.

The vegetation varies from grassland/shrub and agriculture at the lower elevations up through oakbrush, pinion-juniper, ponderosa pine, Douglas fir/aspen, lodgepole pine, spruce/fir and alpine tundra above 12,000 feet elevation.

The climate is highland or mountain climate with cool summers and very cold winters with heavy snow. A portion of the western half of the DAU is in the rain shadow of the San Juan Mountains.. The higher

elevations of the San Juan, Culebra, and Sangre de Cristo mountains receive 30 inches of precipitation a year mostly in the form of winter snows and to lesser extent afternoon showers during the summer months. The foothills receive 10 to 12 inches and the valley floor gets only 7 to 8 inches annually and is considered a high desert.

2.2 Pronghorn Range and Movement

The overall range of the pronghorn is about 1138 square miles of the DAU's total 3351 square miles. The pronghorn in this unit are generally found below 9,500 feet in the grassland/shrub, agriculture, piñon-juniper, and ponderosa pine. Those animals in the timber types are associated with openings and parks such as the area around La Jara Reservoir. In GMU 83 the majority of the population is found in a diagonal band running northeast from the Rio Grande and the New Mexico border towards Blanca Peak. In 2002 during an extreme drought it was common to see pronghorn in piñon/juniper stands.

The highest concentration of pronghorn in the DAU occurs in the Mogote Peak area. This area receives good precipitation annually, even during the drought of 2002, and produces quality forage.

The winter migration in this DAU is usually a movement to south facing slopes and wind swept slopes. Timing and distance moved are a function of winter severity (snow depth). Movement to summer range is a general dispersal throughout the overall range during the summer and fall.

3. Herd Management History

Pronghorn had been exploited by the early 1900's, like much of Colorado's big game animals, due to market hunting and individual settlers who were obtaining food (Warren 1910). Reports of pronghorn between "Garland" and San Luis in 1907 and also on the west side between Antonito and the Rio Grande in 1904 were recorded in early biological surveys (Cary 1911, Bailey 1931). This was when pronghorn were at, or close to, their minimal size.

Although indigenous to the area several releases of pronghorn were made in to the DAU beginning in the early 50's (appendix A). There are no records of animals being trapped and removed from the DAU.

All hunting licenses are limited. Archery licenses became limited in 1999, excluding GMU 83 which became limited in 2007. Muzzleloader licenses went from a statewide limited license to a limited license valid for all GMUs in the San Luis Valley in 2007. At the same time muzzleloader doe tags were done away with. Private land only rifle buck licenses first became available in GMU 83 in 2003.

Hunting licenses are in high demand by hunters. A minimum of 8 preference points are required for a resident hunter to potentially draw a license in GMUs 80 and 81. GMU 83 only has PLO buck license since most of the unit is privately owned and these licenses require 4 preference points.

3.1 Post-hunt Population Size

Post-hunt population size is determined using the best information available at the time in conjunction with a spreadsheet model as described in section one of this plan. Changes are made as new and better information becomes available. Computer modeling is not an exact science and may not produce a final number that is exactly correct. Population models do represent trends well and these trends are a tool used by biologist to make management decisions concerning big game herds.

The modeled posthunt population shows a peak in the population during 1992 of 1600 animals (figure 3). Since that time the population has slowly decreased to its present size of 1000. The cause of this decline is unknown. Drought conditions in 2002 exasperated the decline with poor recruitment.

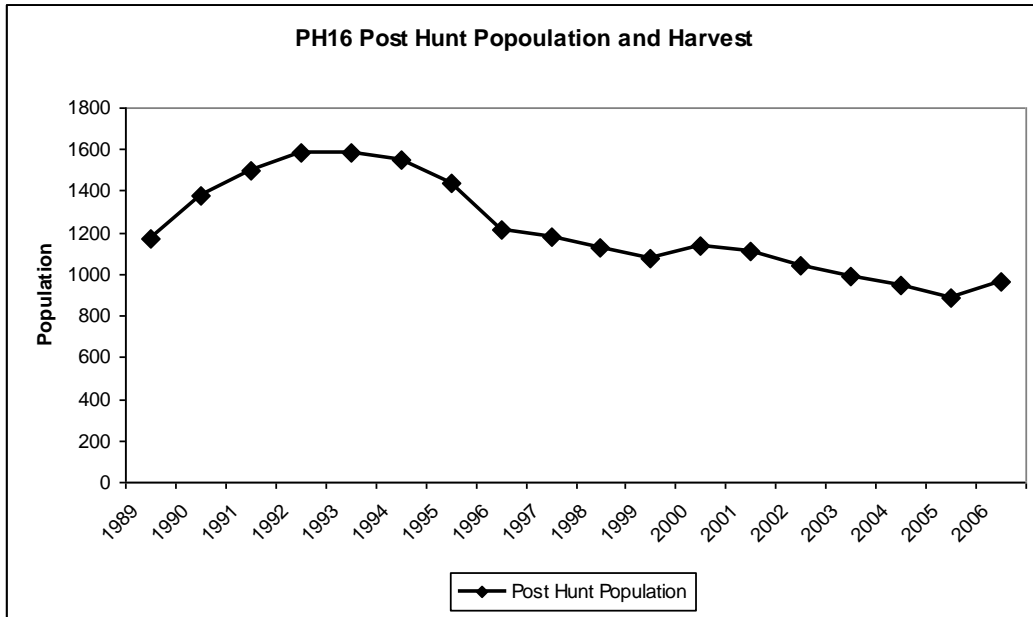


Figure 3. Posthunt population estimate for 1989 to 2006

3.2 Post-hunt herd Composition

The herd composition data are gathered through prehunt aerial surveys, usually conducted the first part of August with a fixed wing aircraft. The surveys are not done to count the total number of animals, but to obtain sex and age ratios. Aerial surveys are subject to variability due to weather, ground cover, sample size and observers. Management objectives are based on posthunt ratios even though surveys are done prehunt. The reason for this is to keep the CDOW's DAU plans in a standard format.

Modeled posthunt sex ratios reached their peak in 1994 at 53 bucks per 100 does (figure 4). Since then they have decreased slightly and are currently at 38 bucks per 100 does. The average from 1989 to 2006 was 45 bucks per 100 does.

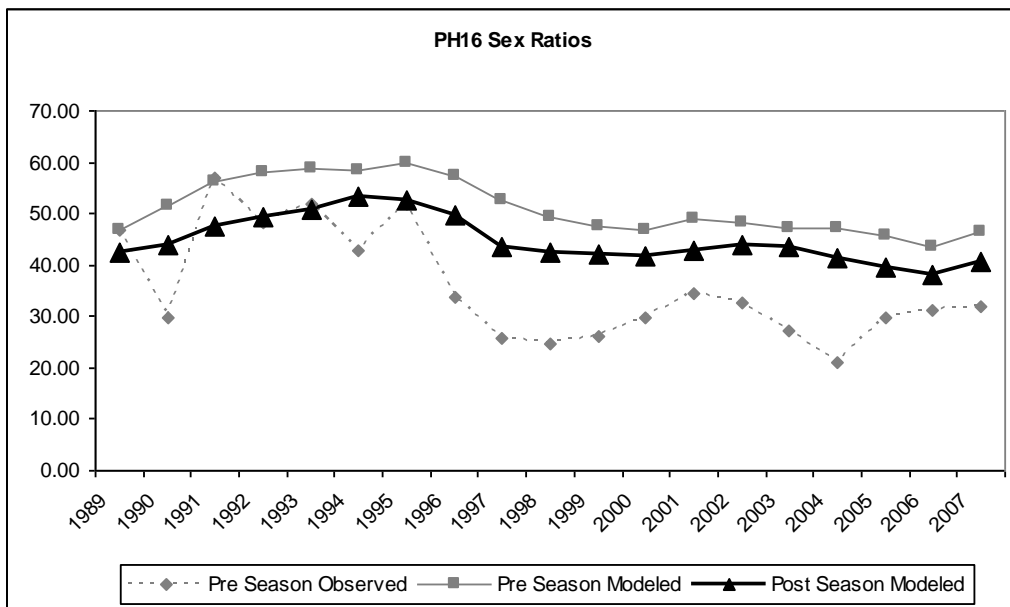


Figure 4. Posthunt modeled, prehunt modeled and prehunt observed sex ratios for 1989 to 2006

3.3 Harvest

Pronghorn harvest is a factor of available licenses which are all limited. Success rates are high compared to other ungulates because of the open habitat where pronghorn are found which in return makes it easier for hunters to find their quarry. Because of this variables in harvest are a reflection of changes in available licenses more than changes in population size.

1999 archery licenses became limited and went from an either sex license to a buck license excluding GMU 83. This was because of poor recruitment in the years leading up to it. Muzzleloaders went from a statewide limited license to a limited license only valid for the GMUs in the San Luis Valley in 2007. At the same time muzzleloader doe licenses were eliminated in this DAU.

GMU 83 opened to rifle hunters in 2003. Archery licenses in the same GMU became limited and converted from either sex to buck only licenses in 2007.

Buck harvest has averaged 48 from 1989 to 2006 (figure 5). In 1996 it reached a maximum of 81 and in 2003 was a minimum of 20. Doe harvest averaged 15 during the same time period with a maximum of 57 in 1996 to a low of 0 in several years doe licenses were not available.

Harvest since 1989 has averaged 58% (appendix B) which is lower than typically associated with pronghorn hunting. A high of 84% in 1989 and a low of 38% in 2000 were recorded. The past three years has averaged 69%.

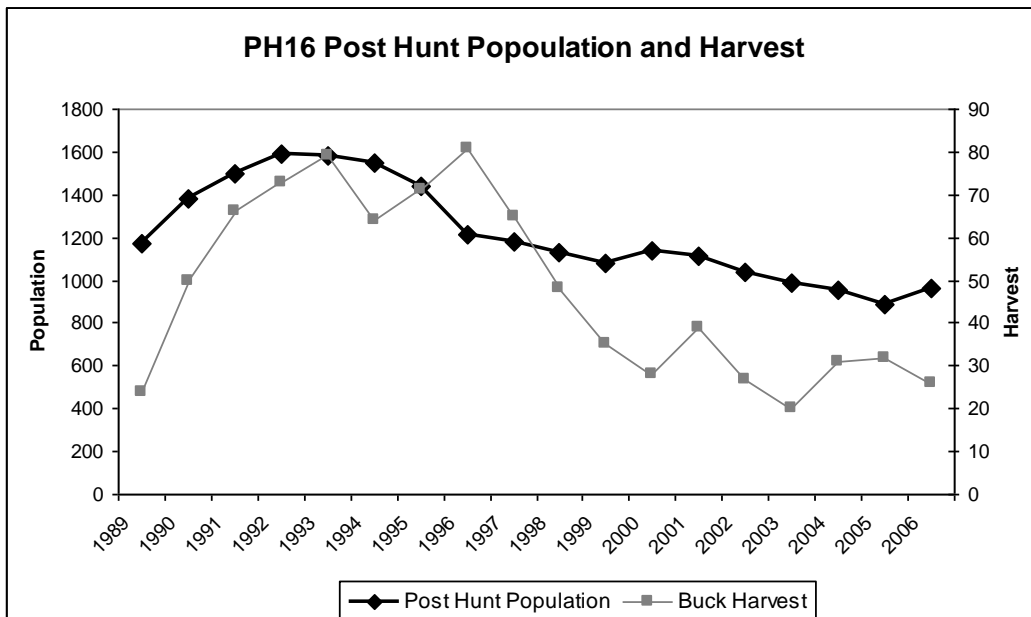


Figure 5. Buck harvest, doe harvest, and post hunt population from 1989 to 2006

4. Current Herd Management Status

4.1 Summary of Current Conditions

The population in this DAU hasn't held a high number of pronghorn like what was seen in the north San Luis Valley DAU. The current population, estimated at 1000, is not far from the estimated peak in the population of 1600 in 1992.

Current posthunt sex ratios objectives are high for GMUs 81 and 80 at 40 bucks:100 does and 35 bucks:100 does. Posthunt sex ratios have been at or above these objectives for at least the past 17 years. These objectives were set to provide quality buck hunts. Pronghorn typically reach their maximum horn size at the age of three and, unlike deer and elk, don't continue to increase their horn growth annually after that point (O'Gara and Yoakum 2004). Horn growth appears to be related more to genetics and forage quality than age. Therefore attempting to increase the quality of bucks through increased limited licenses is irrational. Decreased sex ratio objectives would increase hunter opportunity where hunting demand is high. Slightly lower sex ratios would still sufficiently provide 3+ year old bucks in the population to breed the doe segment successfully and offer quality bucks to hunters.

4.2 Current Management Issues

During 2001, 2002 and 2003 the area experienced an extreme drought. Forage became limited due to the lack of moisture and pronghorn responded with some of the lowest fawn:doe ratios recorded. In response, pronghorn hunting licenses were decreased. Pronghorn around the Magote Peak area, which is higher in elevation and received higher amounts of precipitation during the drought period, were not as impacted as lower elevation herds.

With decreasing licenses, the ability of hunters to obtain a license has also decreased. Currently it requires 8 preference points for a rifle buck license in GMU 81, 9 points for the same license in GMU 80, while GMU 83 still only requires 4.

Another problem in this DAU is the presence of pronghorn on private lands and game damage. During the past years of drought pronghorn have vacated non-irrigated habitat on public lands and moved onto irrigated alfalfa fields where they can cause game damage. An area that has seen the highest impact is in GMU 80 east of Hwy 15 around Co Rd 10S and 12S. Fields throughout Costilla County are also popular with pronghorn.

Development of private lands is a growing problem in the DAU, especially in GMU 80. Impacts to the pronghorn population from development, mostly private homes, include loss of important limited habitat, redistributing animals from historic winter habitat, and migration and movement barriers created by roads and fences.

There are a large number of wild horses in the Music Mesa and Brownie Hill Area along the Rio Grande. During the 2007 antelope classification flights over 60 wild horses were observed in this area. Interspecies competition is presumably present at the expense of pronghorn. Only one buck pronghorn was observed in same area which appeared to be good habitat for pronghorn. Currently there is no management of the wild horses except for perhaps the occasional removal of one by the local residents.

Oil and gas development and its impact to wildlife is a major concern in the west. Currently energy development is being explored within the San Luis Valley, but no economic extraction techniques are currently available to make it cost-effective. Therefore the threat of oil and gas development to antelope populations in the DAU is low. If, however, energy development becomes profitable and begins then its impact could become greater than what pronghorn can survive based on energy development in other parts of the state.

5. Habitat Resources

The overall range of pronghorn in this DAU is 1138 square miles. Lack of water on the overall range and limited winter habitat are limiting factors for this population. Winter range is defined as that part of the overall range where 90% of the pronghorn are located during the average five winters out of ten from the first heavy snowfall to spring green-up. Severe winter range is that part of the overall range where 90% of the individuals are located when the annual snow pack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten. Winter concentration area is that part of the winter range where pronghorn densities are at least 200% greater than the surrounding winter range density.

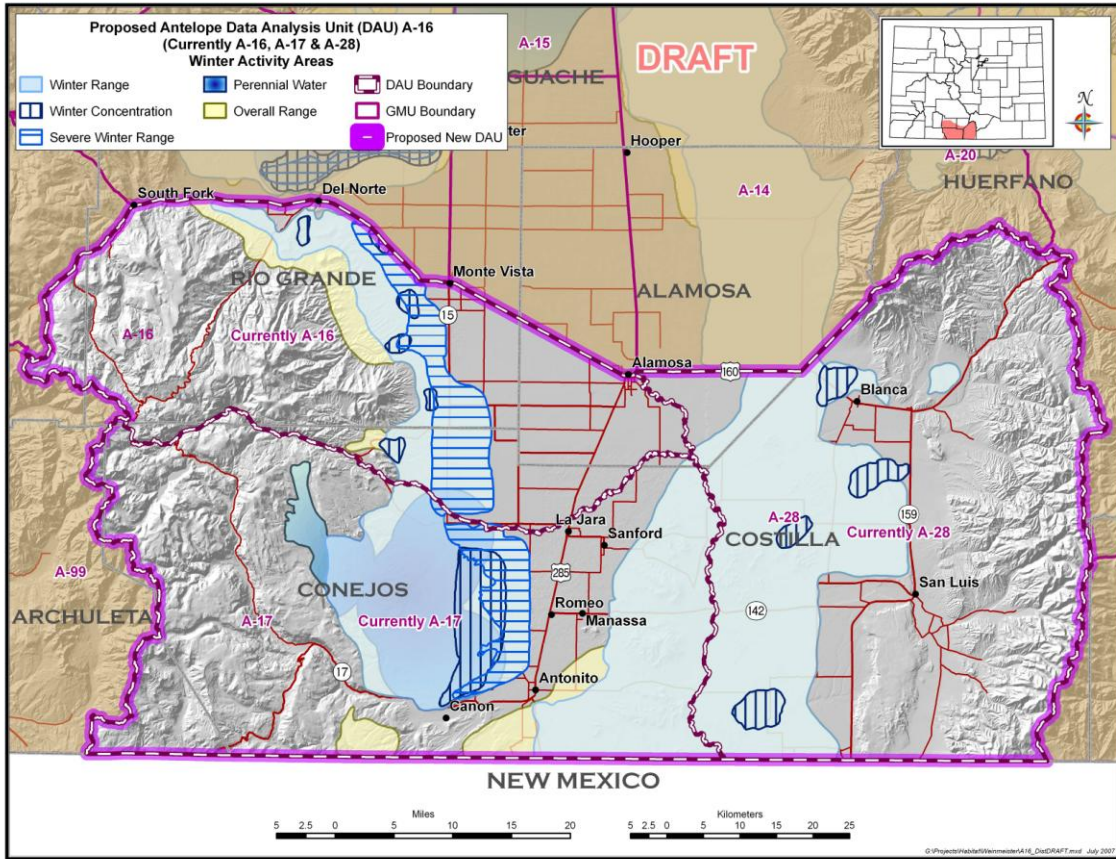


Figure 6: Winter range, severe winter range, and winter concentration areas for PH16

5.1 Public Lands

The overall range of pronghorn in the DAU on public lands is 42% or 478 square miles (Figure 6). Of this 62% is US Forest Service, 26% is BLM, and 10% is Colorado State Land. The winter range is 1025 square miles with 39% or 400 square miles on public lands. Of this 4% is US Forest Service, 79% is BLM, and 15 % is Colorado State Land

5.2 Private Lands

Private land makes up 58% or 660 square miles of the overall pronghorn range and 61% or 625 square miles of winter range. Damage to alfalfa fields and other crops is the most pressing private land issue.

6. Development of Alternatives

The primary purpose of this DAU Plan is to determine the long term post-hunt population objective and herd composition objectives. Sex ratios (buck:doe ratios) are a management option and age ratios (fawn:doe ratios) are a product of environmental factors. The past DAU plan used a set number for each objective. For each alternative proposed for the new plan a number range is given for the objective instead. This is to allow more flexibility in management based on uncontrolled impacts to the population such as extreme weather events and other causes.

Each alternative includes a brief discussion of general results of managing at that level. Generally, the lower the population objective the lower the investment needs to be in habitat improvements. As the objective population increases, the larger the investment needs to be. Habitat management practices vary in labor intensity, costs and life expectancy of the project. Individual practices that could be considered

include prescribed fires, fertilization, seeding, water developments, fencing, timber management, travel management and range management. Game damage problems would probably decrease under the low population alternatives, and would most likely increase as population objective increases. Higher population levels would support a higher harvest by hunters, help satisfy hunter demand and increase the fiscal benefits to state and local economies.

6.1 Population Objective

ALTERNATIVE 1: 500 to 1000 (up to a 50% decrease in current population)

Alternative one provides the lowest population size. Doe licenses would be issued to decrease the population. This would bring the population to the lowest it has been since 1970 or before. This alternative allows the most benefit to farmers who want pronghorn removed from their fields. Because of decreased numbers of pronghorn it would afford the least opportunity to hunters and non-consumptive users.

ALTERNATIVE 2: 1000 to 1500 (current population)

This alternative allows the best balance for managing this herd for recreational opportunity and minimizing agricultural conflicts. Doe licenses would be available and most likely be focused in those areas with the greatest game damage conflict and highest densities of animals. Habitat work and water improvement would be encouraged in areas of low densities of pronghorn in an attempt to have better distribution of pronghorn throughout the DAU.

ALTERNATIVE 3: 1500 to 2000 (50% increase in current population)

This alternative would provide the largest population and is most likely unobtainable during the next 10 years. It would create the greatest potential for agricultural conflicts. Current habitat conditions would make it difficult to achieve this population size with an even distribution of the population throughout the DAU. Habitat improvement projects and water development would be needed in areas with low densities of pronghorn. Recreational opportunities would logically be highest with this scenario.

6.2 Herd Composition (posthunt buck:doe ratio)

ALTERNATIVE 1: 22 to 27 bucks: 100 does

This alternative provides the lowest sex ratio of the three alternatives. This would provide the highest opportunity for hunters to obtain a license. It would keep the sex ratio plenty high so there would be no ill biological effects. Quality of the hunt would be the lowest. This wouldn't necessarily produce smaller bucks in the population but would impact the hunting experience from having an increased number of hunters in the field.

ALTERNATIVE 2: 27 to 33 bucks: 100 does

This alternative would create the best balance between the quality of hunting and the frequency of being able to hunt with no adverse biological impact.

ALTERNATIVE 3: 35 to 40 bucks: 100 does

Alternative three is closest to the current objectives (for GMUs 80 & 81). Outcomes of this alternative would be fewer licenses available which would mean more preference points to acquire a license. This would create the lowest opportunity for hunters. The benefits would be an increased number of bucks, not necessarily bigger bucks, and less hunters in the field. There would be no biological benefit offered beyond the other two alternatives.

7. Alternative Selection

7.1 Preferred Alternatives

The preferred alternatives were selected after gathering input from public meetings, the Blanca and SLV HPP committees, local federal land use agencies, local County Commissioners, written comments, and

Division of Wildlife personnel. Also herd capabilities and other factors mentioned previously were considered.

On November 14, 2007 a presentation concerning this plan was given to the Blanca Habitat Partnership Program Committee. The San Luis Valley HPP Committee received the presentation on November 28th. The SLV Committee supported population alternative 2 and sex ratio alternative 2. Blanca HPP Committee game damage issues with antelope are minimal and they did not provide any verbal or written comments.

A public meeting was held in Center, CO on November 19, 2007 to discuss the DAU plan. 15 individuals participated as landowners and/or hunters. Everyone who expressed interest in pronghorn management wanted the population to be managed at the current level or at a higher level, including farmers receiving game damage from pronghorn. Only one person was interested in sex ratios for this herd and favored alternative 2 of 27-33 bucks per 100 does.

A meeting with US Forest Service and Bureau of Land Management biologists and DOW staff was held on November 29, 2007 to discuss plan revisions. These individuals did not provide comment on this DAU because they didn't feel knowledgeable enough with the pronghorn population to make recommendations.

AWM Rick Basagoitia met with County Commissioners from Costilla, Conejos, and Rio Grande Counties. Costilla County Commissioners wanted more pronghorn and more opportunity and supported population alternative 3 and sex ratio alternative 3. Conejos County commissioners gave similar support. Rio Grande County Commissioners would like to see and increase in the population as well.

Local DOW Area Wildlife Manager and District Wildlife Managers supported the recommended alternatives. This was after discussion about biological, recreational, social, and political impacts of the proposed objectives.

Through input given through these various means it is recommended for PH16 that the **population objective be 1000 to 1500** (alternative 2) and the **sex ratio objective be 27 to 33 bucks per 100 does** (alternative 2).

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Appendix A: Known Pronghorn Transplants into the DAU

Date	Trap Site	Release Site	Males	Females	Fawns	Unknown	Total	Notes
2/21/1951	unknown	20 miles SW Blanca	14	19			33	
3/10/1962	Wolf Ranch	Sego Springs	4	10	2		16	
1/7/1964	Chico Basin	west of Bountiful	7			20	27	unknown were does and fawns
11/22/1976	Maybell	La Jara Res				30	30	
11/22/1976	Maybell	Poso Creek				19	19	
2/6/1980	9 miles NE Saguache	Poso Creek	4	34	13		51	
2/6/1980	9 miles NE Saguache	Ra Jadero Canyon	11	21	19		51	
1/23/1981	Hugo	San Luis Valley	7		9		16	
02/09-10/83	5 miles east of Moffat	10 miles NE of Blanca	28	68	19		115	
2/6/1990	Rito Alto	Fort Garland	6	47	23		76	

Appendix B: Harvest Data

YEAR	MALES	FEMALES	YOUNG	TOTAL	HUNTERS	SUCCESS RATE
1973	24	0	0	24	30	80.0%
1974	21	0	0	21	28	75.0%
1975	21	0	0	21	30	70.0%
1976	21	0	0	21	25	84.0%
1977	19	0	0	19	25	76.0%
1978	22	0	0	22	25	88.0%
1979	25	6	0	31	38	81.6%
1980	44	7	0	51	64	79.7%
1981	37	16	6	59	88	67.0%
1982	40	17	3	60	76	78.9%
1983	44	21	4	69	88	78.4%
1984	62	34	0	96	143	67.1%
1985	50	5	0	55	110	50.0%
1986	44	11	1	56	72	77.8%
1987	58	13	1	72	97	74.2%
1988	59	13	1	73	101	72.3%
1989	50	17	1	68	81	84.0%
1990	50	13	0	63	106	59.4%
1991	68	18	6	94	135	69.6%
1992	73	23	4	100	165	60.6%
1993	79	36	0	115	159	72.3%
1994	64	49	0	113	174	64.9%
1995	73	31	2	106	224	47.3%
1996	81	51	6	138	271	50.9%
1997	65	18	0	83	187	44.4%
1998	48	9	0	57	149	38.3%
1999	39	9	0	48	90	53.3%
2000	32	0	0	32	85	37.6%
2001	42	2	0	44	97	45.4%
2002	32	0	0	32	74	43.2%
2003	20	0	0	20	35	57.1%
2004	27	0	0	27	45	60.0%
2005	29	2	0	31	44	70.5%
2006	21	0	0	21	27	77.8%