

# PRONGHORN

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## "Unit 2 Pronghorns"

by Winford Hooe, Region I Wildlife Manager

District 2 is comprised of Units 2A, 2B, and 2C. These units cover over 2600 square miles of northeastern Arizona. The elevation of this area ranges primarily between 5000 and 7000 feet above sea level. The major vegetation types present, in decreasing order of area covered, are Pinyon-Juniper Community, Plains and Desert Grasslands, Saltbush Community, and Sagebrush Community.

The State Land Department owns 38.7% of these units, while private ownership accounts for 35.7%. The Bureau of Land Management (BLM) owns 19.5%, and the National Park Service (Petrieved Forest National Park) has 6.1%. Some of these lands are "blocked up", but most are in a "checkerboard" pattern. This means that there are alternate sections of private and State land or private and BLM land.

Most of the area within these units is used by antelope. Based on the current population data, these units have a very low density of antelope when compared to other units within the state.

Unit 2A is the largest of the three units, but has the lowest antelope density. The Petrified Forest National Park is within this unit. The southern portion of the Park (south of I-40) seems to have a little higher antelope density than the rest of the unit, at least during the winter season.



Photo courtesy of Jim McCasland

The estimated pronghorn population for all of Unit 2A is just under 700 animals. For the past several years, the buck/doe ratio has been high, but the fawn/doe ratio has been relatively low. However, the five-year average fawn/doe ratio is still higher than the other two units. Last year's survey showed that there were 61 bucks per 100 does, and 16 fawns per 100 does.

Unit 2B is in the middle of the other two units in both size and in antelope density. There are 540 antelope estimated to be within this unit. The last survey showed 42 bucks per 100 does, and 7 fawns per 100 does.

The smallest of the three units is Unit 2C, but it has the greatest density of pronghorns. The current population estimate is 460 antelope. The buck/doe ratio has been falling the past few years. The 1992 summer survey showed that there were 19 bucks per 100 does, and 18 fawns per 100 does.

Both Units 2A and 2C are open during the regular rifle season, and have had high hunter success for many years. Since the 1985 hunting season, Unit 2B has been a muzzleloader hunt. The average hunt success for the muzzleloaders has been 60%, ranging between 40% and 70% in any given year.

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**"Short Shots"**

The Arizona Antelope Foundation recently completed its first work project in conjunction with the Arizona Game & Fish Department and the Prescott National Forest. Approximately 25 pronghorn enthusiasts showed up for the two-day project on May 15th and 16th to make a little over three miles of fence line on the Yavapai Ranch south of Seligman more conducive to antelope movement.

The five strands on the barbed-wire fence were reduced to four, with the bottom strand being replaced with smooth wire. Area Wildlife Manager Bill Foldesh, who coordinated the project, commented, "I don't think I've ever seen a more dedicated, hard-working group of conservationists. We accomplished a lot, and the bottom line is that the antelope in this area are the big winners."

Habitat Committee Chairman Jim McCasland is currently firming up the next AAF work project which will take place sometime in July. This project will be in Unit 5A, and once again will involve a lot of volunteer manpower to improve an existing fence line to allow for freer antelope movement. Entire families are welcome on these projects. It's a great opportunity to get out of the city, camp out for a weekend, and do something beneficial for wildlife. Watch for the project flier in the mail.

A 1993 antelope hunter clinic and workshop has been scheduled for the evening of August 17th in Phoenix by the AAF. Several of Arizona's pronghorn experts, including Robin Bechtel, Tony

Grimmett, Jim McCasland, Mike Cupell, and others, will be giving quality presentations.

Some of the subjects which will be covered are field judging trophy antelope, hunting techniques, and trophy care. Make a note on your calendar because you won't want to miss out on the information presented this evening.

\* \* \* \* \*

Both of Arizona's special antelope permits were auctioned this spring, one at the annual fund-raising banquet hosted by the Arizona Desert Bighorn Sheep Society and the other at a similar banquet hosted by the Phoenix Chapter of Safari Club International. Jerry Fletcher, an Arizona resident, purchased one of the tags for \$13,000 and Sam Jaksick, from Nevada, purchased the other for \$12,400. Mr. Jaksick has bought this same tag previously, and has taken some truly outstanding Arizona pronghorns with it.

All the money raised from these two tags goes back to the Arizona Game & Fish Department to be used exclusively for antelope management, which includes habitat enhancement. It is anticipated that the AAF will have the opportunity to auction these tags in the future.

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The Arizona Antelope Foundation membership is growing rapidly. As of the end of May, there are 85 paid members, including 35 charter members. Remember that charter memberships will be available only through the end of December, 1993.

**Calendar of Events**

- Antelope Hunter Workshop ..... August 17, 1993  
Holiday Inn Airport East
- Unit 5A Work Project ..... July 17 and 18, 1993

# "Pronghorn by the Numbers"

by Richard A. Ockenfels, Research Biologist,  
AZ Game & Fish Dept.

$$N = (B - D) + (I - E).$$

What in the world is this? What has this gibberish got to do with managing pronghorn? This statement includes everything a biologist, as well as the public needs to know about pronghorn life history. Diet, behavior, reproduction, water requirements, habitat characteristics, and other pronghorn life history characteristics you think of or know about are included in these five letters.

How does one line of symbols represent everything you need to know about pronghorn? Inherent within this statement is the sum of effects from all natural processes such as predation and weather. Also included are human-related activities such as range management, harvest management, road and fence building, and housing developments. Some of these factors can effectively be managed, while others are out of human influence.

So, what does this statement really mean? This statement is pronghorn population dynamics in a nutshell. Quite simply, this statement determines the number pronghorn that exist in any given area. What it says is:  $N$ , the number of pronghorn in a population, is equal to number of births ( $B$ ) minus number of deaths ( $D$ ), added to the number of pronghorn coming into the population ( $I$ ) minus the number leaving ( $E$ ).

Natality, or birthrate ( $B$ ), is the number of births in a pronghorn population. Natality is controlled by numerous factors. Such obvious factors as litter size, gestation period, and rate of sexual maturation (i.e., age at first reproduction) impact natality. Sex ratio of a population, female age structure, and physical condition of breeding age animals also influence natality. Less obvious factors such as breeding system (which is partially defined by number and age of males in a population), harvest



Photo courtesy of AZ Game & Fish Department

management, population fragmentation, and disturbances can play a part in determining natality.

Mortality, or deathrate ( $D$ ), is the number of deaths in a pronghorn population. Pronghorn mortality starts at ovulation and can be divided into the following categories: 1) embryonic, 2) fawning, 3) non-breeding (i.e., yearling), and 4) mature adult.

Embryonic mortality starts at ovulation. Pronghorn typically release more ova (eggs, 4-7) that fertilized, but high egg failure is normal. After fertilization, embryo reabsorption is also common. The end result is typically 1-2 surviving embryos for does in good condition. Evolution and female physical condition largely determine embryonic mortality. Female health can be readily affected by range condition.

Pronghorn fawning mortality is typically high. Stillborn births occur, and

poorly developed fawns quickly succumb to environmental conditions. Pronghorn fawning mortality from predation is what we hear about the most for the management of pronghorn populations. The main three fawn predators are: 1) coyotes, 2) golden eagles, and 3) bobcats. Coyotes have received the most notoriety, but the other predators can be as important in certain circumstances. Most predation occurs during the first 2-3 weeks of life. Other sources of fawn mortality are hypothermia, disease, injury, and maternal abandonment.

All these factors reduce the number of fawns recruited into a pronghorn population. Managing for higher recruitment needs to consider many factors. For example, amount of herbaceous or shrub cover, water distribution, and predator densities affect fawn mortality rates. These factors can be managed through sound range management techniques. Alternative prey species for predators can be managed through harvest strategies and improved range management. In addition,

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Every five years, the Arizona Game & Fish Department develops a five-year strategic plan for managing Arizona's game species. This plan sets the objectives for each species. Then the Species Management Guidelines and the Hunt Recommendation Guidelines are developed, which conform to the above objectives. Both of these guidelines are developed to standardize management responsibilities and the hunt recommendation process across the state. Within the guidelines, each wildlife manager conducts population surveys, population estimates, and hunt recommendations.

For the past several years, the antelope have been surveyed in these units during August. The data from this survey gives us the current buck/doe ratio and fawn/doe ratio. Based on these ratios, the population estimates are made. A Region I computer population model has been used to assist wildlife managers in coming up with the population estimate.

Winter antelope surveys were flown in Region I for the first time in 1991. Winter surveys consist of trying to survey all the potential antelope habitat within a unit, and to get a rough total count of the animals. This information can be used to come up with a population estimate, or, compared with the computer model population estimate, to assist in validating the model.

In 1991, Units 2A and 2C were flown; then, in 1992, Unit 2B was flown. During these surveys, areas flown and approximate locations of each group were mapped. From this data, antelope population densities could be figured for the units. Winter surveys of antelope habitat can greatly add to the ability of a wildlife manager to manage the species.

Hunt recommendations are based on all data available; buck/doe/fawn ratios, population estimates, harvest data, and any other information which affects the population or harvesting.

A research project was initiated last July on the Petrified Forest National Park within Unit 2A. This is a joint project between the Arizona Game & Fish Dept. and the National Park Service's Colorado Plateau Studies Unit at Northern Arizona University. This study will go hand in hand with the habitat evaluation study underway in central Arizona near Cordes Junction/Dugas. Since the Park has been ungrazed for around thirty years, this gives us the opportunity to start comparing effects of pronghorns on grazed areas and ungrazed areas.

Loss of habitat is the greatest concern of any species management. Without habitat, the species just simply cannot survive. Each year more developments or sub-divisions are being created. These are sub-divisions of 10+ acre divisions of sections (square mile) of land. For antelope, the checkerboard land ownership pattern compounds the problem of sub-divisions. The range needed for antelope cannot be maintained in alternate sections with sub-divisions and with all the new fences and human activity in between. A few antelope will survive, but not at near the same density.

Checkerboard land ownership patterns also create problems with access to State land for hunters or non-consumptive users. The current law allows landowners to deny access across private land to get to State land.

Another problem shared by many units within this region, and across the state, is the chronic low antelope fawn survival. The five-year (1988-92) average fawn survival (fawns per 100 does) is

23.8% in Unit 2A, 11.2% in Unit 2B, and 12.8% in Unit 2C. That means that with all of these units combined, the five-year average fawn survival has only been 16 fawns per 100 does!

Based on the work done on Anderson's Mesa by Don Neff and others, we have used aerial coyote control to help increase the fawn survival. The control was used just prior to or during the first part of the antelope fawning season in some portions of Unit 2A in 1990 and 1991.

I flew separate surveys for the controlled and uncontrolled areas those years, and found 14 fawns per 100 does in the controlled areas in 1990 compared to 6 fawns per 100 does in the uncontrolled areas. In 1991, I surveyed 60 fawns per 100 does in the controlled areas opposed to 44 fawns per 100 does in the uncontrolled areas.

As you can see, the coyote control does have an effect. This can be used to give a temporary boost to the fawn survival, and thus aid the pronghorn population.

I believe that progress has been made in the management of antelope. The use of more intensive surveys, or simply more survey time being available, the use of computer modeling, and the use of coyote control have all aided the antelope populations and their management. But there are other hurdles to be cleared.

The blocking up of State or BLM lands to protect antelope habitat and the purchasing of habitat by interested conservation groups, or by the Game & Fish Dept., should be a high priority. Also, we should work more with land agencies and ranchers to allow for more cover for antelope fawning, to improve water distribution, and to modify some fences to allow for better antelope movement.

# "Sonoran Pronghorns"

by Jim deVos, Research Branch Chief, AZ Game & Fish Dept.

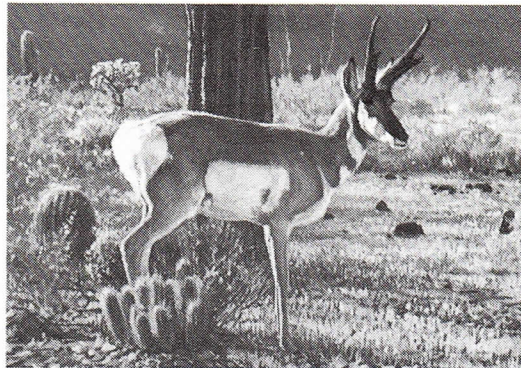
"Vamos amigos!" It was time to get to the airport and people were sleeping in. We were in Sonora Mexico and were about to embark on a capture of Sonoran pronghorns in the Pinacate region. This was a first for many of us and we weren't sure what to expect, but we knew it was important to get to the airport soon. Finding pronghorn is easier in the early morning when the rising sun makes the tan and white-colored animals show up much better.

This was an important effort as the Sonoran pronghorn is in danger of extinction in both the United States and Mexico. In 1988, in discussions with biologists in Mexico, they indicated that there may be as few as 20 Sonoran pronghorn remaining in Sonora; an area that was once the stronghold of this subspecies. If this were true, there was cause for concern.

To minimize the cost of the capture project, we were using two fixed-wing aircraft to survey for the animals. Once a group was observed, the planes would call a helicopter and crew to capture an animal. In spite of a slow start, it was not long before a group of pronghorn were observed, and our first capture was completed.

The fruit of our effort was a doe equipped with a radio collar disappearing over a nearby sand dune. Over the next two days, this scene was repeated eight times, and, by the last shrimp dinner in Mexico, nine collared pronghorn were the nucleus of a continuing project.

While the part of the collaborators from the U.S. was over, the work of the biologists in Mexico was just beginning. The capture featured the newest and greatest of American technology. The follow-up work was neither as glamorous nor as



easy. You see, the field biologists were to follow the animals every month to collect information on general life history, movement patterns, habitat use, and mortality factors. All of this data is to be used to develop a management plan to ensure continued existence of this endangered subspecies.

Severely limited by funding for the project, biologists were forced to go into the field in a nearly ancient two-wheel drive truck. Things which we take for granted, such as a good pair of binoculars, were but a dream for those field people.

Fortunately, there is a group that also has a dream. There are people who want to see the Sonoran pronghorn populations recovered to the point that they are removed from the Endangered Species List. Their interest was great enough that the International Sonoran Antelope Foundation was formed.

One of their fundraising ideas was to develop a print of a Sonoran pronghorn with all the revenue from its sale to be used to assist managers with needed efforts. These funds will help buy vehicles and field items for biologists in Mexico. If you have any interest in obtaining a wonderful print of a pronghorn in the Sonoran desert and, in the process, helping a biologist in Mexico do his job, consider purchasing one of the "Phantom of the Desert" prints. For additional information, contact Jim deVos at 789-3247.

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such factors as fencing structure and building housing developments in key fawning habitats also affect fawn mortality. Land management decisions need to consider effects on fawn mortality.

Predation affects non-breeding and mature adult mortality. For many pronghorn populations, predation on adults is believed to be low. However, predator mortality can be substantial. The main predators on adults are: 1) coyotes, 2) golden eagles, 3) wild dogs, 4) mountain lions, and 5) man.

Harvest management also impacts pronghorn adult mortality. Many factors need to be considered. Should a hunt be either-sex or buck-only hunting? What is an acceptable crippling loss for each weapon type? How well trained should hunters be? What percent of a buck population can safely be harvested? Will the harvest change age structure of the buck population, and indirectly influence the breeding system?

Other factors influence adult mortality. Fencing entanglement, road kills, winter kills (because of the inability to migrate across highways), and starvation due to poor range conditions all play a role. Poaching is always possible.

Ingress (*I*) is the number of animals entering a population, while egress (*E*) is the number leaving. Ingress-egress affect genetic interchange and lessen chances for inbreeding. Within a pronghorn population, age structure animal density, and sex ratio influence ingress-egress (movement of individuals between populations). Ingress-egress is also affected by habitat changes (i.e., brush or tree encroachment). Anything else that modifies migration corridors, such as fences, roads, and housing developments, impact free movement between populations.

Next time, we will study pronghorn natality and what research scientists have learned about this basic element of pronghorn population dynamics. For now, remember, management is in the numbers.