

# Pronghorn Antelope

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*Pronghorn bucks*



Pronghorn antelope (*Antilocapra americana*) are America's only true native big game species. Antelope developed in North America approximately 30 million years ago, whereas deer, elk, bighorn sheep, and mountain goats all migrated across the Bering Strait from Asia during more recent ice ages, based on fossil records.

When European man first came to the western United States, there were an estimated 30 to 60 million antelope in North America. But overharvest, competition with livestock, conversion of native rangeland, and other man-caused problems reduced antelope numbers to approximately 13,000 by the early 1900s. Protection and careful management have brought this spe-

cies back. There were just over 400,000 antelope in the United States in 1976; currently, there are nearly 400,000 in Wyoming. Approximately 70,000 antelope are harvested in the state each year, producing \$4 million in license revenues and adding \$24 million to Wyoming's economy.

## **Natural History**

The antelope is commonly associated with grasslands and sagebrush communities which exist primarily in the midwestern and western states. Antelope have keen vision and speed unmatched by any other North American mammal which allows rapid escape from predators. Habitats with short vegetation and relatively flat

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*Pronghorn fawns develop rapidly but still spend the first days of their lives hiding and resting. Patches of sagebrush provide important cover for these growing infants.*

terrain help antelope evade predators. Thus the open plains of its native range provide habitats that are most suited for antelope.

Antelope mate during a September breeding season lasting two to three weeks. Bucks compete for territories and mate with does occupying those territories. Does give birth in late May or early June, after 250 days of gestation. At birth, the fawns weigh five to seven pounds and are susceptible to predation, but their ability to run and evade predators increases rapidly. Although female fawns occasionally breed in their first fall, most females breed for the first time as yearlings, when they are 15 to 16 months of age. The birth of twins frequently occurs in antelope, and 100 fawns per 100 does is common on good quality ranges. On poor quality ranges, fewer than 20 fawns per 100 does have been reported.

#### **Habitat**

A number of habitat features determine the suitability of ranges for antelope. Topography is important because it affects the ability of antelope to evade predators, affects snow accumulation patterns, and can affect diversity, quality, and quantity of forage. Antelope generally prefer flat to gentle rolling topography, areas with less than five to ten percent slope. But studies also indicate that areas with an intermixing of ridges and drainages provide a greater diversity of vegetation which may provide foraging benefits to antelope. For example, areas with greater snow deposition often have better soil moisture conditions for plant growth during summer. During winter, ridges with wind-blown, snow-free areas provide antelope with easy access to forage. Studies have shown that antelope survival during severe winters is increased when such snow-



free areas are available. Based on this, some antelope studies suggested areas averaging five to 20 percent slope provide the best habitats for antelope, particularly in winter.

Density and height of woody vegetation also influence suitability of antelope ranges. Antelope prefer areas with vegetation averaging about 15 inches or less in height and avoid areas with vegetation averaging 30 inches in height. Taller, denser vegetation apparently impedes escape from predators.

The amount of space needed by individual antelope varies considerably among seasons and depends on the quality of habitats available. In summer, home ranges tend to be relatively small if water and food are adequate. In Wyoming, home ranges have been reported to be one to two square miles during summer and as large as four to six square miles in winter.

The basic habitat requirements of water and forage shape the daily movements and seasonal migrations of antelope. In Wyoming, fall and spring migration by antelope have been reported to exceed 250 miles from Moran Junction south to Rock Springs. Snow depth strongly influences the antelope's choice of winter range. As snow depths exceed seven inches, antelope seek

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*A nursing fawn puts extra demands on an antelope doe. High-quality forage and a good source of water are important to her health and the health of her offspring.*



areas with topographic diversity such as wind-swept ridges and south-facing slopes where snow depths are reduced.

Fences can restrict antelope movements and can be a direct cause of injury or mortality. The greatest detrimental impact occurs when fences bisect migration routes or interfere with daily movements to and from water sources. Antelope will cross certain fence types by going through, jumping over, or crawling underneath. But many types of fences form highly effective barriers to antelope movements, and can cause mortality by preventing access to areas with reduced snow in winter. Scores of antelope dying along fences are not uncommon during severe winters.

### **Food Habits**

The diets of antelope vary considerably among seasons and areas, reflecting differences in palatability and availability of forage species. In spring, antelope usually select young green grasses. These forage items are highly digestible and high in nutrient content. In summer, grasses mature, and antelope shift their diets to broad-leaved forbs due to their relatively high nutrient levels. Antelope seem to select areas with high soil moisture such as playas where plants are more succulent and nutritious. By late summer and early fall, palatability of forbs decreases, and antelope begin to consume considerably more browse. When the leaves fall from deciduous browse, antelope will consume primarily sagebrush, including big sagebrush, black sagebrush, and silver sagebrush. When fall rains are adequate to initiate grass growth, antelope will often seek young grass shoots to supplement browse diets. During winter, browse comprises the majority of antelope diets. Studies show the number of antelope that a winter range will support largely depends on the amount of browse available on that winter range.

Several studies of food items used by antelope have been conducted in Wyoming. Near Wamsutter, a study found that, during summer, a typical antelope diet consisted of big sagebrush (55 percent), rabbitbrush (30 percent), forbs (5 percent), and grass (7 percent). By winter, antelope consumed about half as much rabbitbrush, fewer

grasses and forbs, and diets consisted of up to 90 percent big sagebrush. A study conducted from April through October near Medicine Bow indicated antelope consumed from 33 to 90 percent shrubs, up to 45 percent forbs, and from five to 30 percent grasses. Fringed sage and big sagebrush were the most important shrubs; scarlet globemallow and buckwheat were the most important forbs; and sedges, wildrye, and needle-and-thread were the most important grasses.

Some researchers have concluded the best antelope ranges consist of ten to 30 percent forbs, five to ten percent browse, and 40 to 60 percent grasses. But others have indicated more browse and less grass would provide better forage conditions for antelope. This appears more realistic because grasses generally are less nutritious than forbs or browse except when young green shoots of grass are available.

### **Water**

Water is a critical component of antelope ranges during summer and fall. Ranges which produce and maintain high antelope densities have water available every one to five miles. Studies in Wyoming indicate that most groups of antelope occupy areas within three to four miles of water. When fawns are young and water requirements for lactation (milk production) are high, antelope generally occur very close to water (within 700 yards).

Studies have indicated that antelope can sub-





sist only on water found in highly succulent plants. But as water content in forage decreases, antelope become more dependent on standing water. Antelope will drink from a wide variety of water sources including springs, reservoirs, water catchments, streams, lakes, and stock-watering facilities.

During winter, antelope probably get most of their water from snow. But studies near Rawlins, Wyoming, indicate antelope seek unfrozen, standing water in winter. Providing open water in winter may be especially important in areas where winter precipitation is minimal. In Wyoming, the Worland area receives only about 0.3 inch of precipitation per month from December through February, and observations there indicate antelope use unfrozen water sources at this time.

#### **Habitat Improvement for Antelope**

Habitat improvements on antelope range must be carefully designed for the seasonal use of the area. Habitat improvements conducted haphazardly, although potentially beneficial in some situations, might be detrimental in others. To prevent possible detrimental effects, some basic

information must be gathered on antelope use of the area. For example, is the area a winter range, summer range, or only used during fall and spring? Is the area used for fawning? What is the concentration of water sources, density and type of fences, intensity and season of use by domestic livestock, and types of vegetation present on the area? Topography and amount of human activity should also be evaluated, as either may affect or prevent use of an area by antelope. It is assumed, then, that areas to be treated are (1) normally occupied by antelope, (2) meet minimum requirements for occupation by antelope, or (3) can be made acceptable by modifying certain features, such as adding water or changing fences. If antelope do not use an area due to characteristics that cannot be changed with reasonable effort (e.g., dense forests, mountainous terrain), improvements will provide little benefit. Finally, because needs of antelope differ substantially among seasons, seasonal management guidelines are presented.

#### **Late Spring, Summer, and Early Fall Ranges**

On antelope summer ranges, density and type of fences, density of standing water, extent of





*Winter often forces antelope to congregate in large herds on small, snow-free areas. Preserving part of the summer's forage in these areas is critical to antelope survival.*

use by livestock, and forage quality and quantity can be managed to increase habitat quality.

Antelope biologists have made the following recommendations for fence construction to reduce detrimental effects on antelope movements: (1) Fences on cattle ranges should be constructed of three strands with the top strand no higher than 38 inches above the ground. The bottom wire should be barbless and at least 16 inches above the ground. (2) Fences on domestic sheep ranges should be constructed of four strands with the highest strand not exceeding 32 inches in height. The bottom wire should be barbless and located at least ten inches above the ground.

Water sources should be spaced no more than one mile apart to provide maximum use of the range. Water sources evenly spaced one-half mile apart likely provide optimum watering conditions, particularly when lactation peaks (June and July) or later in summer when forage becomes relatively dry. Antelope will use a variety of water sources; however, water with a pH exceeding 9.25 or containing total dissolved solids in excess of 4500 to 5000 ppm will be avoided.

Water developments should be designed to

provide water throughout the summer. Reservoirs or dugouts placed in potholes or dry lake beds should be relatively deep to provide maximum storage with minimum surface area to reduce evaporation loss. One side of dugouts and reservoirs should have a relatively flat slope to enhance big game access. Water catchments (guzzlers) and developed springs also have been used successfully for antelope. Springs can be developed to improve water production and availability to wildlife, but there is a risk that the water source will be lost during development. Water from this source can be piped to a catchment basin, and the source of water fenced to prevent trampling by livestock and wildlife.

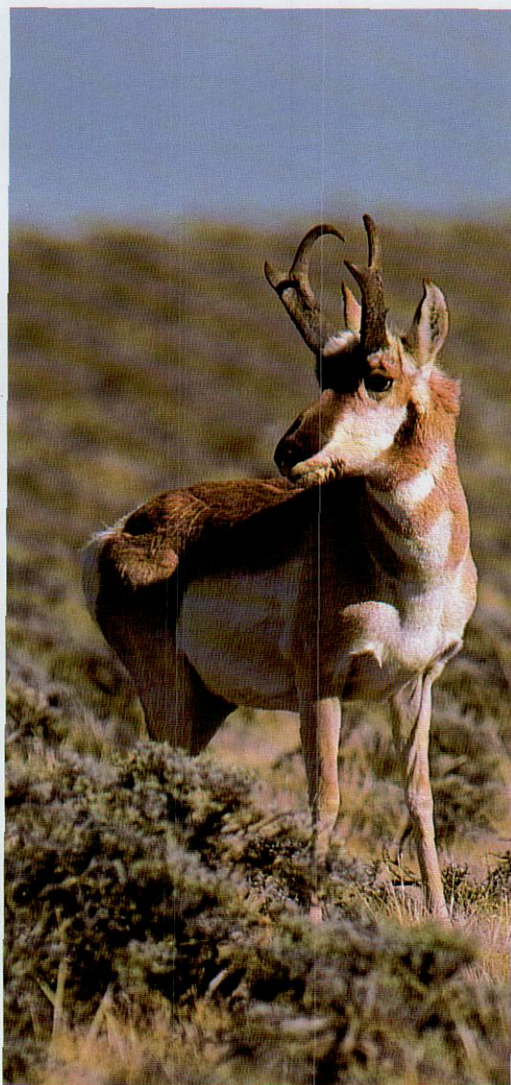
Placement of water developments can affect their use by antelope. Water developments should be placed in open terrain; dense juniper stands, dense forests, or areas where human activity is common should be avoided. Fencing all or at least portions of the water source is recommended to exclude livestock, with fences designed to allow antelope passage. Slopes to the water must be adequately gentle to allow antelope, particularly fawns, to enter and leave the area easily. Watering troughs that exceed 20



inches in height may prevent young antelope and other small mammals from drinking, so higher troughs should be counter-sunk in the ground.

Competition with livestock can substantially reduce forage needed by antelope. Studies in Wyoming indicate that dietary overlap of antelope, horses, cattle, and domestic sheep can be substantial during summer. Heavy livestock grazing in late spring and early summer may remove young grasses and forbs preferred by antelope. Also, both cattle and antelope select areas with high soil moisture content and more succulent vegetation during summer. If cattle use of these areas is high, antelope may suffer nutritionally. Careful review of livestock grazing patterns and intensity may be required to minimize negative effects on antelope.

Forage quality and quantity can be improved substantially for antelope, but procedures and results are highly dependent on local site conditions. Methods that work in one location may not work in others. Antelope are known to congregate in burned areas, and prescribed burning may be one of the most cost-effective techniques for increasing forage quality and quantity. Recent studies in Wyoming have shown that burning will increase grass and forb production, increase digestibility and nutrient concentration, and remove decadent, old plant growth. This latter effect enhances consumption of younger, more nutritious parts of plants, thereby improving diet quality. However, fire also can have detrimental effects. Fire removes big sagebrush which is an important component of antelope diets. Other shrubs are variably affected. Rabbitbrush, bitterbrush, mountain mahogany, and other shrubs will sprout after fire, and fire often increases forage production from these shrubs. How these plants respond, however, often de-



Adult pronghorns feel most comfortable in landscapes that offer good visibility. Large tracts of sagebrush over 30 inches in height tend to exclude antelope.

pends on conditions during burning. Studies in south-central Wyoming indicate burning in the spring (late March or early April) before substantial plant growth begins produces the best results and is the easiest to control because soil moisture is high.

Removing big sagebrush from summer antelope ranges may have detrimental effects on antelope diet quality. Thus burns on summer ranges should be small (less than 30 acres) and designed to create a mosaic pattern in which small burned patches are widely distributed throughout an area. This will allow antelope to forage on burned areas at times when they can obtain the greatest benefits from them, while maintaining big sagebrush availability. Studies in Wyoming indicate burns

on summer ranges should be conducted on east, north, and northwest aspects where soil moisture conditions are higher. Increased soil moisture may enhance plant growth throughout the summer and maintains higher forage quality later in summer. Burns conducted on southerly aspects tend to dry out earlier, resulting in peak forage quality in spring and lower forage quality in mid-to late summer when nutritional requirements of antelope are high, especially for fawns.

Another potential problem with burning antelope summer ranges where fawning occurs is that shrubs are often used to provide cover for fawns. Does frequently give birth and raise young fawns in areas with high shrub densities. Fawn survival is related to the amount of cover provided by shrubs in these areas. Thus, it is important to keep burns small and highly dispersed in areas where fawns are born and spend their first month of life.

Finally, livestock grazing must be carefully managed to prevent serious harm to burned areas. Livestock are strongly attracted to burned



areas, and heavy use by livestock can severely reduce the survival and productivity of plants recovering from burning and can enhance the invasion of undesirable weedy species. Livestock should be excluded from burned areas the first year following treatment. During the second year, livestock grazing should be light and postponed until late in the growing season. Thereafter, grazing of treated habitats by live-



*Antelope may eat quite a bit of grass in early spring. Through most of the year, however, they prefer broad-leaved plants and shrubs.*

stock should be monitored to ensure abundant forage remains for antelope.

A number of other habitat treatment techniques may also improve forage conditions for antelope. Chaining and/or riling are two techniques which involve dragging a large anchor chain (one link weighs 50 to 100 pounds) or train rails between two tractors. These techniques kill the older, more decadent browse species but enhance growth of younger shrubs and increase forb production. Range pitting uses a modified disk that makes small indentations in the soil's surface which turns the soil and increases water holding capacity. This will increase the amount of succulent vegetation during the spring and reduce competition with less desirable plant species.

Artificial seeding of rangelands has been used to improve forage conditions for antelope in Oregon. Seeding mixtures should predominantly include forbs and palatable shrubs as well as grasses. In Oregon, antelope managers successfully established Nomad alfalfa, a dryland culti-

var that maintained itself well through time relative to other plant species. Antelope appeared to respond positively to areas seeded with this alfalfa. Due to reasons outlined for burning, seeded areas should be small and interspersed among areas supporting native vegetation.

Fertilizing antelope ranges has been studied to some extent. In Alberta, Canada, application of nitrogen fertilizer increased forage protein content during the summer and increased forage production. Antelope selected fertilized plots over unfertilized adjacent areas. Similar studies in Wyoming, however, revealed little difference in protein

content in fertilized vegetation, and antelope did not prefer fertilized areas. Differences between the studies may be due to different application rates. Nitrogen application rates in Alberta were four to 12 times greater than in the Wyoming study. In Alberta, the greatest plant response resulted from application rates of 282 pounds of nitrogen per acre. The small amount of information available regarding antelope response to fertilization and the high costs associated with it makes it impractical at this time.

#### **Late Fall, Winter, and Early Spring Ranges**

There may be less opportunity to improve winter than summer habitats for antelope. Studies have shown that the number of antelope supported by a winter range depends strongly on the height and density of shrubs present. In Wyoming, big sagebrush is the most common shrub on winter ranges. Habitat management that reduces this shrub substantially will probably hurt antelope during severe winters.

However, if adequate information exists to



identify late fall and early spring ranges, fire might be a useful method to improve forage quality and quantity. Burning techniques described earlier for summer ranges would be appropriate for fall and spring ranges. If used very carefully, fire might also improve antelope winter ranges. Fire has been shown to increase the quality of forage during winter, but burning strategies to achieve this objective differ from summer approaches. Burns on winter ranges should be placed on southwest aspects where build-up of snow will be less and plant growth during late fall, winter, and early spring will often be greater due to warmer soil temperatures. On south to southwest aspects, solar radiation has a greater warming effect with increased slope. Placing burns on hillsides with ten to 20 percent slope rather than flat areas may increase the amount of soil warming, reduce snow depths, and increase the amount of plant growth. Chaining, raiing, and range pitting also may increase forage production on winter ranges.

Burns or other vegetation treatments should be conducted in areas where antelope are known to winter. If burns are conducted away from known wintering areas, antelope may be reluctant to move to them, particularly if there are barriers to movement such as fences, highways, or topography. Again, treated areas should constitute a small portion of the total winter range because shrubs are critical food during severe winter weather when vegetation on burned areas would typically be covered with snow. Burns conducted on southwest aspects should also provide more nutritional benefits during early spring than burns placed on east, north, or northwest hillsides.

The fertilization experiments conducted in Alberta (described earlier) were designed to determine if forage quality and quantity could be increased during winter. Protein content of fertilized forages, although increased in summer, was no higher than in unfertilized forages during winter. But the increase in forage production was considered to be beneficial to antelope in winter. So fertilization has potential to improve forage conditions for wintering antelope, but, again, the cost-benefit ratio should be considered.

Livestock grazing on areas where antelope concentrate during winter should be moderate. Forage removed by livestock during summer is forage unavailable for antelope during winter. Domestic sheep grazing during fall, winter, and spring in areas where antelope spend late fall, winter, and spring may greatly decrease forage available to pronghorns because sheep and pronghorn diets during this time overlap substantially. Conversely, cattle and antelope con-

sume very different diets during this time, so cattle grazing may be more compatible with antelope.

In conclusion, there are a considerable number of options for improving ranges for antelope. Habitat improvements can allow antelope to occupy new areas and increase density and productivity of antelope where they already exist. Careful evaluation of current range conditions should be conducted to identify management treatments that will provide the greatest benefits. And monitoring of antelope response will help identify ways to modify treatments to most effectively benefit antelope.

### Additional Readings

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