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Mule deer fawn in subzero cold on private land about 6 miles east of Drummond, January 2017.

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Winter Range

One hundred and forty pronghorn is a big bunch, whether on the plains of Eastern Montana or a hundred miles this side of the Continental Divide, near Drummond, as pictured here. This accounts for about one-third of the free-ranging pronghorn found west of the Divide in Montana, with most of the rest living closer to Deer Lodge and Butte in the winter. During summer, smaller groups range from Bearmouth north into the Blackfoot and southeast to Garrison or beyond. These animals likely descend from 49 pronghorn that were transplanted from Winston, south of Helena, to the Deer Lodge area in 1947, and another 119 brought from Wheatland and Musselshell Counties in Montana to the Warm Springs area in 1948. They are part of the story of Montana's legacy of wildlife restoration, where the 3,000 survivors of market and subsistence hunting in the early twentieth century were restored to more than 220,000 animals by the start of the twenty-first (Picton and Lonner 2008).

Reference Cited: Picton, H.D. and T.N. Lonner. 2008. Montana's Wildlife Legacy—Decimation To Restoration. Media Works Publishing. Bozeman, Montana.

These pronghorn in west-central Montana are a public resource supported almost entirely on private land, and during the winter they depend on ranches mostly between Drummond and Gold Creek, where families pasture their cattle on the native grasslands in the summer and grow crops to feed their cattle in the winter. In winter, and often in spring and fall, large numbers of elk and mule deer share the land as well, where ranchers have made their livings for generations. It's a place where habitat is alternately shared and partitioned among species, in a coexistence born of necessity and, in the case of the landowners, great generosity of spirit and empathy for another life making a living out in the elements in a sometimes harsh environment that we call home.

Resource

Browsing by which species is responsible for the growth form of Rocky Mountain juniper shown at the top of this photograph? Is it the elk, feeding closest to the woody plant in question? Is it the mule deer, feeding at left, nearby? Could it be the pronghorn that share this winter range? Or is it a relic of utilization by cattle in the summer and fall?

The responsible species might be any or all of the above. This juniper, along with the native grasses and sagebrush pictured on this winter range, not to mention the slope and elevation, illustrate the opportunities offered in nature for a number of wildlife species to coexist within a limited area. While an individual of one species may seem to rub shoulders with an individual from another species, they may be using different and somewhat separate resources within the same landscape. It's called resource partitioning (Baty 1995).

Literature Cited: Baty, G.R. 1995. Resource Partitioning and Browse Use by Sympatric Elk, Mule Deer and White-tailed Deer on a Winter Range in Western Montana. Masters thesis, University of Montana, Missoula.

Partitioning

Resources may be partitioned by vegetation category. Elk tend to prefer grasses when grasses are available. Mule deer tend to prefer shrubs in winter, though like elk, they will feed on grasses as well as browse. Pronghorn tend to forage lower in elevation and off slopes such as these. Cattle, too, prefer to be on gentler slopes closer to water, as indicated here by the amount of grass leftover for wildlife.


Mule Deer on Juniper


Mule Deer on Bitterbrush

Rocky Mountain Juniper

As if magnetized, pronghorn swarm a Rocky Mountain juniper (above) along their trail to feed in harvested cropland. The feeding bout was brief, lasting for perhaps five minutes. Mule deer (at left) are fine feeders as well, selecting the most succulent tips of the current year's growth. Juniper are widely scattered on this winter range, and while some juniper plants show evidence of heavy, historic browsing (as on page 5), most juniper plants look like those pictured on the preceding page and above—either lightly browsed or generally unbrowsed. One would expect that a truly preferred forage species in short supply on the winter range, and browsed by multiple wildlife species, would be excessively browsed and damaged with far greater frequency than we see on juniper across this winter range. Biologists call species like these juniper "ice cream plants," meaning that they are beneficial and consumed when convenient, but are not essential as food for wintering ungulates on this particular winter range. The relative importance of forage species varies from place to place, depending on the menu that is available. Although juniper may not be as important to wintering ungulates on this winter range between Drummond and Gold Creek, where bitterbrush is available as the preferred fare, juniper might be more important on winter ranges where bitterbrush and other palatable shrubs are uncommon or absent.

Bitterbrush

From a distance, the growth form of bitterbrush (pictured at left) may be mistaken for sagebrush. Like sagebrush, bitterbrush is important winter forage for antelope and mule deer. The distribution of bitterbrush in Montana, west of the Continental Divide, is sparse, making this native habitat between Drummond and Gold Creek highly valuable for wintering ungulates. Biologists from Montana Fish, Wildlife & Parks in Region 2 monitored browse utilization annually in this general area (Hunting District 291) from 1967 to 1990, and 100 percent of the current year's growth on bitterbrush plants had been nipped, primarily by mule deer, in 1990.

Pronghorn 101

Pronghorn seem to have eyes in the backs of their heads; eyelashes, if not eyeballs, can be seen on every fleeing individual (at left), even when running directly away. They differ from other ungulates on Montana winter ranges in this respect, and with their eyes set back farther on their heads, pronghorn are said to have 320 degrees of vision.

The pronghorn running away (at left) are a buck, fawn (~7 months old), doe, buck and doe (from left to right). The individuals on the skyline (above) are a doe, doe, doe, fawn, buck and buck. Males may be distinguished from females by their black cheek patches, as seen on the trailing two animals (above).

Both sexes have horns, though the males' are larger. Pronghorn are unusual among horned animals because they shed the outer horn sheaths in the late fall. The bucks on these pages have shed their horn sheaths and are in the process of growing new ones. According to Picton and Lonner (2008):

> *Pronghorns have an extraordinary number of adaptations for running. Their ability to process oxygen is five times greater than a domestic goat and several times that of a world class human athlete. Speed of a pronghorn running over native prairie has been measured at 53 miles per hour. This compares to 49 miles per hour attained by thoroughbred race horses on the smooth prepared track of the Kentucky Derby and 22 miles per hour for the best human sprinters. Specializations in their muscle cells, brain cooling mechanisms needed for long distance exertion, as well as adaptations such as a heart and lungs with two to three times the capacity of other mammals of equal size give pronghorn extraordinary endurance.*





Fences

Pronghorn of all ages want to duck under fences, rather than jump, which is why wildlife friendly fence designs call for the bottom wire to be at least 18 inches above the ground. Elk calves—to nearly one year of age—also duck under fences if at all possible, as do deer fawns. It is often said that pronghorn won't jump a fence.

However, pronghorn are capable of jumping a fence if necessary, as observed in January on the winter range between Drummond and Gold Creek. The barrier was sheep fence (below)—a woven wire design that prevent animals from ducking under or between the wires. And, about 140 pronghorn jumped it, with difficulty (left).

The herd milled at a low spot where the top wires had been broken down, possibly by elk crossing. Then, one by one, individuals took flight. It was apparent that this species is not adapted to bound over obstacles or across rocky terrain to escape predators. It seemed from a distance that the animals also lacked confidence in the location of the top wire. Although the fence appeared to be quite low in the location where the crossing occurred, the pronghorn seemed to leap as high as possible, without regard for the actual height required for clearance.

Although every individual succeeded in crossing this time, it's likely that repeated fence crossings by pronghorn would result in injuries and the occasional death, due to their reluctance and awkwardness while jumping.

Destination

By all appearances, this field of cultivated pasture grasses would be the primary pronghorn feeding destination for the evening, having trailed a mile or more from their midday bedding area. Although dried vegetation was available above the snow, their feeding seemed focused on something beneath the snow surface. They pawed feeding craters in the snow to access their desired forage, which comes at a cost. Winter is a balancing act, when ungulates spend as little energy as possible to obtain the best forage available. Generally, ungulates such as pronghorn burn stored fat reserves for their energy in winter because the food they are able to obtain in the winter typically offers only maintenance calories at best. It's a marathon race between the capacity of their fat reserves, accumulated from green vegetation in the summer, and the duration of the winter. If winter outlasts the fat reserves, gravid females will resorb or abort their fetal offspring, or give birth to underweight fawns that will be less likely to survive. Snow condition is a critical factor, and when a hard crust forms, it may not be worth the energy for animals to paw for food beneath the surface and they may have to settle for less digestible foods, such as juniper, for example.

Severe cold consumes stored calories and compels the pronghorn to seek food if quality food is reasonably available. In this case, without knowing for certain, we'd guess that these animals are pawing for green growth that sprouted in the fall. We received needed fall moisture and enjoyed an extended period of relatively warm, snow-free weather into Thanksgiving weekend, which would have been conducive to green growth emerging at the bases of ungrazed, unharvested grasses, or regrowing from the crowns of grazed plants. This unseasonably succulent growth would be found close to ground level, where it sometimes freezes green when winter arrives abruptly, as appeared to be the case in late November. Such growth is somewhat comparable in digestibility to the first shoots of spring, and if our hypothesis is true, then these animals are able to conserve their fat reserves for another day.

Competition

Elk, pronghorn and mule deer segregated themselves somewhat spatially when using the same or similar foods, at least during the periods when we observed them between Drummond and Gold Creek in January. Here, elk feeding craters in the snow are apparent in the background and foreground in this irrigated field located not far east of the pronghorn, and downslope from the mule deer. Elk made repeated visits to this particular field in January, while the pronghorn generally worked a bit farther west.

Interspecific competition refers to competition between different species inhabiting the same general area. We've seen examples of resource partitioning between different species using the same space, as well as examples of spatial separation as another strategy to alleviate the potential for interspecific competition.

Here we see an apparent expression of intraspecific competition, which is competition between individuals of the same species. That elk would have the energy to spar over a feeding crater suggests that these animals have retained good body condition to this point in the early winter. And a look at the necks and carriage of the entire group would support that suggestion.

Elk likely exert the greatest competitive stress in this environment, not only on pronghorn and mule deer, but also on each other and on the livestock operation. Elk numbers are high, and as a generalist species—able to use a variety of habitats and feed upon a wide variety of plants, as well as some of the coarser portions of the plants—elk are capable of overwhelming habitats and microsites that may be of critical importance and limited in availability to mule deer or pronghorn.

Elk occur in high enough numbers on this winter range that they could damage their native range through overuse. Elk numbers are buoyed here by the abundance of high quality foods that they consume on croplands in the spring, summer and fall, which allows them to build sufficient fat reserves to endure winter for some years or decades on a substandard or declining winter range.

Landowners, hunters and FWP are working together to manage elk numbers on private lands and restore a balance.

Whitetail Winter Habitat

0 degrees F, January 2017

Winter ecology in a white-tailed deer system is different than in the pronghorn system of the Drummond-Gold Creek area. On the Blackfoot-Clearwater Wildlife Management Area, white-tailed deer share a forested landscape with mule deer and elk. Resource partitioning plays an important role in the strategies that the species have evolved to share the forest during Montana's long winters. From 1991-1994, Ross Baty studied "Resource Partitioning and Browse Use by Sympatric Elk, Mule Deer and White-tailed Deer on a Winter Range in Western Montana," which resulted in his master's thesis of the same title, from The University of Montana, in 1995. The Blackfoot-Clearwater WMA was that "Winter Range in Western Montana," and findings from Baty's study are paraphrased as follows:

Deciduous Browse

The prevailing wisdom going into Baty's research was that deciduous browse species, such as serviceberry, chokecherry and willow, were the primary food source for white-tailed deer, mule deer and elk in a forested environment with deep snow. To our surprise, Baty found that at 2-3 tons per square mile, annual production of deciduous browse on the Blackfoot-Clearwater winter range would support the estimated 72 cervids (deer and elk) per square mile for only about 9 days. However, carcasses of deer and elk at winter's end were few: less than 2-3 per square mile. Clearly, deer and elk depended on forage other than and in addition to deciduous browse to sustain them through 120 days of winter.

Here, a shed buck feeds on a deciduous shrub—perhaps serviceberry. The nipped end of a recently browsed twig can be seen beside the deer's mouth.

Browsing Mechanics

The whitetail buck uses its tongue to draw the desired plant part into the desired location within its mouth. Lacking upper incisors at the front of its mouth, the tongue is used to position the twig across its molars, or cheek teeth (below). When drawn back in the mouth, the buck uses its molars to snip the buds and twig (next page).

Conifers were traditionally considered to be a last resort as deer forage—a starvation food and an indicator of overstocked winter range. However, Baty found that white-tailed deer and mule deer consumed high amounts of Douglas-fir, primarily, and ponderosa pine in January, before deciduous browse had been depleted. Elk diets also included conifers throughout the winter period.

Hanging tree lichens were consumed by deer and elk on a daily basis. Lichens are a food that enhances the overall digestibility of the winter diet, and account for much of the attraction of cervids to windthrown and logged tree tops.

Although deer and elk distribution overlapped on this winter range, white-tailed deer selected for sites with shallower snow, less crusted snow and higher daily temperatures than mule deer or elk. Mule deer were more tolerant of deep snow at the upper elevations of the winter range, but used dense subalpine fir cover, mature Douglas-fir, and north-facing slopes to combat snow-crusting and for above-snow forage.

Elk preferred to feed on grasses until snow depth and crusting rendered grazing unprofitable (next page). For the latter half or more of the winter period, elk retreated with the deer species to the forest. Elk generally were more tolerant of open forest canopies than either deer species, which reduced competition. In addition, deer benefitted by following behind long-legged elk in deep snow, thereby conserving energy.