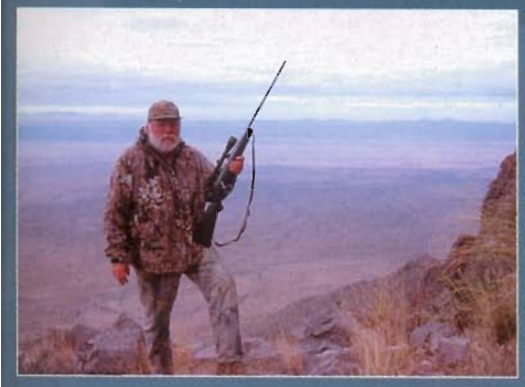
Deer & Elk Competition

Story by Dr. Charles E. Kay



Are Mule Deer getting the short end of the stick?

As preeminent cervid ecologist, Valerius Geist, correctly notes, the first thing you have to know about elk – deer competition is that, "Elk and mule deer did not co-evolve." Elk, or red deer, evolved in Europe and migrated to the Americas about 12,000 years ago along with Paleo-Indians, moose, and other species. Mule deer, on the other hand, are a home-grown product having evolved in North America over the last million and a half years, or so. The second thing you have to understand about elk – deer competition, is that there are more elk on intermountain ranges today, than at any point in the last 12,000 years. In addition, there are more mule deer on western ranges today than at anytime in the last 12,000 years except for the 1950's, 1960's, and 1980's.

Historically, and prehistorically, native hunters kept all wildlife populations at very low levels. As anthropologist, Thomas Neumann, has explained, in 1491 passenger pigeons were uncommon in the East because Native populations were so dense that all the seeds and berries the birds needed for food were consumed by humans. It was only after the American Holocaust decimated aboriginal populations that passenger pigeons irrupted to unnaturally high levels. The same is true of other species.

In 1491 there were no 60 million bison, not 10 million elk, and certainly not 100,000 grizzlies! For those new to this subject, I suggest you see the book I co-edited on Wilderness and Political Ecology: 'Aboriginal Influences and the Original State of Nature' or Charles Mann's recent book '1491'. For why you were never taught any of this in school, you may wish to consult the 'Lies My Teacher Told Me' by James Loewen. So the bottom line is that elk and deer did not co-evolve and those species have experienced intraspecific competition only recently, (the exact opposite of what many biologists would have you believe).

Before we get to the nuts and bolts of the elk – deer competition, we also need to review ruminant physiology. Deer and elk do not eat food like you and I eat food. Moreover, deer and elk do not actually "eat" plants. Instead they consume microbial by-products and the microbes themselves. In addition, the plants that deer and elk select are determined in large measure by the size of the animal's respective mouthparts, as well as the size of their fermentation vats or rumens. The latter effects retention time or how long things have a chance to ferment, which in turn, determines the proportion of high quality versus low quality foods eaten by the species. Finally, many plants are chemically defended and thus cannot be eaten in large quantities because the chemicals interfere with microbial digestion. This includes pinion, juniper, oaks, conifers, and even sagebrush, among others.

"While growing elk numbers are not the only problem faced by mule deer, there is no way that you can have high elk numbers and healthy mule deer populations on the same ranges for any length of time."

David Virostko

Due to their smaller-sized rumens and shorter retention times, mule deer need to consume plant parts that contain a lot of protein and which are highly digestible. This limits mule deer largely to forbes, or flowering plants and shrubs, but mostly leaves and buds. Mule deer will readily eat grass only early in the spring; when it is short, green, and easy to digest. However, they will also consume grass late in the fall after autumn rains have greened-up bunchgrasses. The rest of the year, mule deer cannot live on a grass diet and they certainly cannot survive on cured-out grasses during winter. Because mule deer must select for high quality foods, they are what is termed a concentrate feeder. It is also important to remember that low-quality foods are always more abundant than high-quality foods, unless you are standing in an alfalfa field.

Physiologically, elk are an entirely different animal. Because elk have a larger rumen, both in absolute terms and proportionally, they can survive and reproduce on lower-quality diets than mule deer. Elk can live on a 100% shrub diet or a 100% grass diet and everything in between. But, and here is the rub, elk prefer to eat the same high-quality foods that mule deer must eat. This is especially true during winter when elk and deer are forced onto limited areas and high-quality foods are less abundant than at other times of the year. Experimentally, it has been shown that elk can digest their diets more effectively than mule deer can digest their foods, and elk can digest mule deer diets more effectively than can deer! Finally, once all the high quality foods are skimmed off, elk can live on the remaining lower quality foods, while deer cannot. In short, elk have a wider diet breath than mule deer. But this is not the only factor that makes elk a superior competitor.

Elk can reach higher than mule deer, so more food is physically available to elk than mule deer, especially on shrub ranges during winter. Elk, because of their larger body size per unit surface

area, retain heat better than mule deer; yet another clear advantage during the critical winter season. As you might expect, because of their longer legs, elk also have a competitive advantage as snow depths increase. This is why it was noted as early as 1939 that winters, which kill large numbers of mule deer, have little effect on elk. But there is even more bad news for there is also what is known as interference, or disturbance competition.

> "While most of the emphasis has been on elk-logging-cattle interactions, it was also noted that mule deer avoided elk like the plague!"

Apparently, mule deer find elk offensive and will move to other, albeit lower quality areas, when elk arrive. I recall a Utah Division of Wildlife Resources (DWR) biologist telling me that when he first was assigned to the Cache Valley during the 1960's how wintering areas were dominated by mule deer, while today those same areas are used exclusively by elk. Similarly, in Utah's Book Cliffs, a 1980 study using radio-collared animals identified key mule deer wintering areas that today, are overrun by elk. This forced some mule deer into an active oil and gas field. DWR's response was to try and limit drilling. My response was that we needed to kill elk!!

Experimental work is starting to confirm these antidotal accounts. In Oregon's Blue Mountains, the Forest Service has been conducting research since 1987 at a place called Starkey. The 25,000 acre experimental area is high-game fenced and contains summer, spring, and fall ranges, but no winter range – so elk and deer are fed when snow is on the ground. This is a unique study in that elk, mule deer, cattle, and hunters were all radio-collared, (the hunters actually wore GPS backpacks). And while most of the emphasis has been on elk-logging-cattle interactions, it was also noted that mule deer avoided elk like the plague! Or to quote the authors, "The dichotomy in resource selection between the two species, combined with the inverse relationship between mule deer locations and elk.....indicated that mule deer avoided areas used by elk." Remember, this occurred on a timbered summer range, where food was not limiting. Moreover, when hunters moved the elk around, mule deer vacated the areas the elk moved into and the deer then moved into even poorer habitats.

In an attempt to resolve the growing dispute over elk – deer competition, the Rocky Mountain Elk Foundation (RMEF) commissioned a 1997 report by the Wyoming Cooperative Fisheries and Wildlife Research Unit on Potential Competitive Interactions Between Mule Deer and Elk in the Western United States and Canada: A Review, which reached the exact same conclusion that I and others have reached, namely that elk are superior competitors to mule

deer on western ranges. But then, interestingly, the report claimed there was no proof that elk had actually competitively excluded mule deer!!! Their idea of proof was that elk and mule deer needed to be confined inside a large enclosure with the two cervids left to compete, and to see who was left standing. Unfortunately, the RMEF funded report failed to realize that this experiment has already been done, and on a grand scale no less!

By the early 1900's, elk were eliminated from what is now Rocky Mountain National Park in Colorado, as were wolves, grizzlies, and Native Americans. In 1913, Yellowstone elk were relocated to this part of Colorado and today there are up to 4,000 elk in the park. As their numbers grew, elk destroyed aspen, willow, and shrub communities, especially on key winter areas in the park. As their food supply was eliminated, mule deer numbers declined by more than 90%. In 1939, park naturalists counted 648 mule deer and 263 elk on a portion of that park's winter range, while a similar census in 1997 yielded nearly 1,200 elk and less than 150 deer – sadly, those trends continue to this day. A similar situation exists in the Yellowstone ecosystem, where elk presently outnumber mule deer by about ten to one. Yet between 1835 and 1876, early explorers, who spent 765 days in the ecosystem on foot or horseback, reported seeing mule deer nearly as often as they saw elk. While in archaeological sites, dating back 10,000 years, identified mule deer remains outnumber those of elk by twenty to one! Moreover, when Yellowstone National Park was first established, up to 2,000 mule deer wintered on the park's northern range but as growing elk numbers destroyed aspen, willow, and shrub communities, wintering mule deer numbers fell. Today, few mule deer winter in the park and if it were not for private ranchlands further down the valley, there likely would be no mule deer left. Historically, and archaeologically, there is no evidence that large numbers of

elk ever inhabited Yellowstone until after Native hunters were removed and hunting was prohibited. This is true throughout western North America.

High elk numbers also competitively excluded mule deer in Canada's Banff and Jasper National Parks, where I have conducted research on long-term ecosystem states and processes for Parks Canada. By the early 1900's, elk were extirpated from most of the Canadian Rockies, but sightings of mule deer were common. After elk were reintroduced, however, elk numbers grew and severely overgrazed the range – after which mule deer sightings fell; a classic example of competitive exclusion. But then during the late 1960's and early 1970's, wolves re-colonized Jasper and then Banff National Parks. The addition of wolves to a system that already contained mountain lions, grizzlies, and black bears caused a drop in elk numbers of up to 80%, but instead of recovering, mule deer numbers fell even lower, because mule deer are more susceptible to wolf predation than the larger-bodied elk. In fact, the only way mule deer survive at all is by spacing themselves out widely and occupying poor quality habitats seldom used by elk.

So not only is there resource competition between elk and deer, as well as interference competition, but there also is what is termed apparent or predator-mediated competition. As I have explained in earlier MDF articles on predation, the addition of elk to what were historically mule deer systems, maintains high predator densities, which then exert ever-increasing pressure on the more vulnerable mule deer. These three types of competition, along with many other factors, such as declining habitat, lead cervid expert, Valerius Geist, to conclude, "For all its current abundance, the mule deer, so different, so uniquely American, so young and promising, is nevertheless a species marked for extinction."

I have known Val for many years and I for one would not bet against him, especially if we do nothing. Letting nature take its course is not an option if you want to maintain or increase mule deer numbers. We need to get off our collective duffs and do things that promote the survival of mule deer, which of course is why the Mule Deer Foundation was formed. Rest assured that hunters are the only people who will, because we have a vested interest. If we do not work to save mule deer, no one else will, certainly not the people promoting wolf recovery. So while growing elk numbers are not the only problem faced by mule deer, there is no way that you can have high elk numbers and healthy mule deer populations on the same ranges for any length of time. This is why people are doing their best to keep elk off the North Kaibab and Arizona Strip, two areas renowned for record-class mule deer. From a mule deer's perspective, there is such a thing as too many elk and what is good for the elk, is not necessarily good for the mule deer.

And for those who think I am anti-elk, my RMEF membership number is 186.

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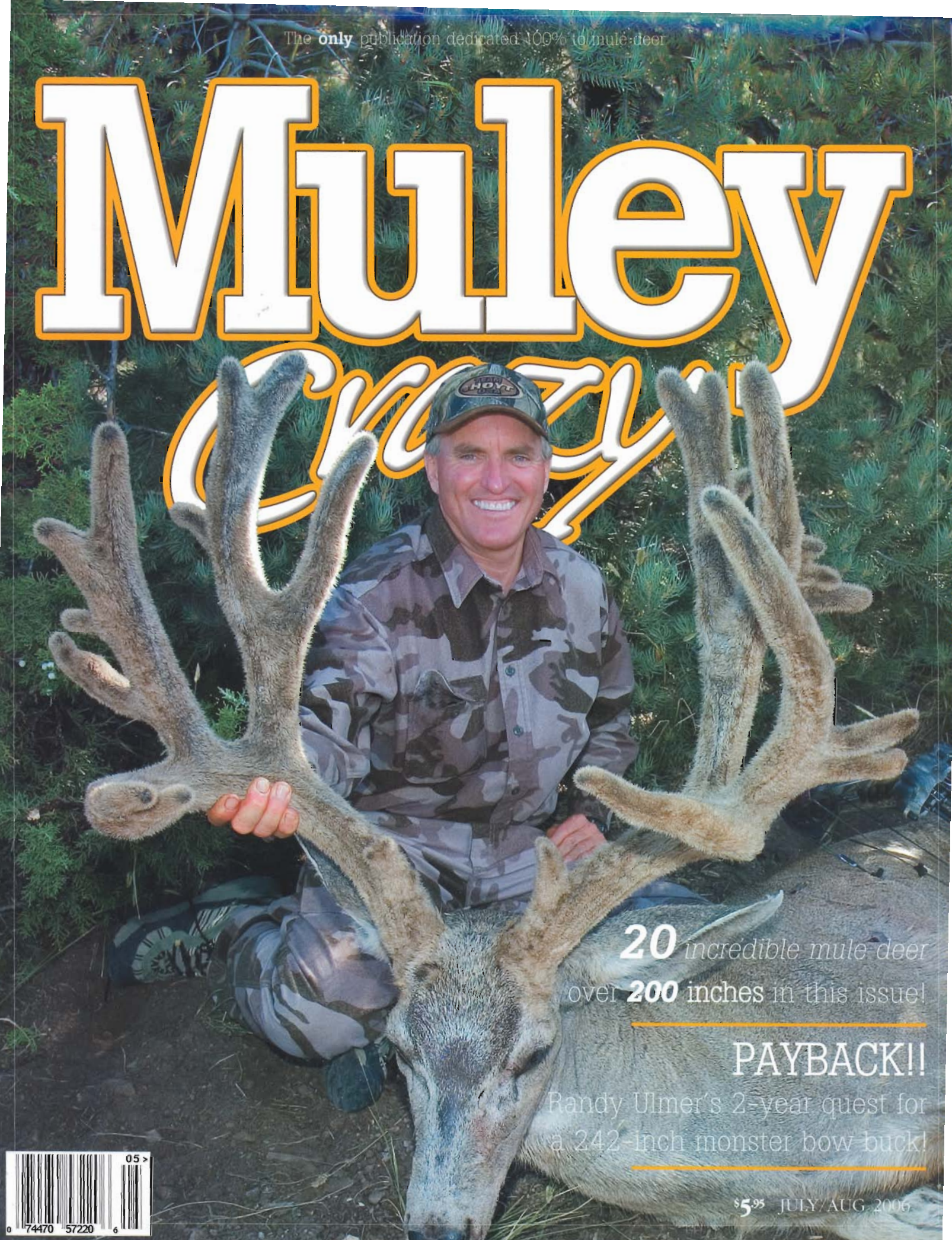
Muley Crazy



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