

Developing Trophy Antlers

by James E. Knight, MSU Extension Wildlife Specialist (retired)

Many landowners look at the horns and antlers of big game animals on their land as the true measure of their success as wildlife managers. Landowners interested in developing trophies should become familiar with Boone and Crockett scoring procedures. The Boone and Crockett Club has developed procedures for measuring big game and has kept records since 1932. You can find measuring information on the Boone and Crockett Club website (www.boone-crockett.org). Although they are very different in their origin, the horns on pronghorn antelope and the antlers on deer and elk are influenced by identical factors that determine growth and development. Antler and horn development begins and ends with testosterone. Antler and horn growth begin when blood serum testosterone levels rise. Antler and horn shedding is triggered by greatly reduced testosterone levels. During late summer, increasing testosterone secretion at the time of the rut causes the antler velvet to shed, the bone to harden and the death of the antler. The length of daylight triggers these changes in testosterone levels. Most of the minerals that the growing antlers or horns require are taken directly from food, but calcium is pulled from the skeleton. The body condition of the buck or bull in early spring, when antler or horn growth begins, influences how much nutrition goes to replenish body condition and how much goes to developing headgear. There are three factors that determine the size of antlers or horns: genetics, nutrition and age. Genetics influence a particular animal's potential to grow trophy-sized antlers or horns. Almost all areas of the west have the right genetics to grow trophy horns and antlers. Even with the right genetics, good range is also required. Unless there has been a severe winter or drought, good range with a good diversity of forage species will supply the necessary minerals and nutrition that horns and antlers need for maximum growth. Probably the most important factor in determining how large a particular animal's antlers or horns will grow is the animal's age. Death before full maturity is what usually prevents a big-game ungulate from reaching its greatest antler or horn potential.

Pronghorn Antelope Horns

As mentioned in the previous chapter, antelope horns have a permanent inner bony core and an outer sheath made of hair. There is a prong that grows toward the front and near the middle of the horn. The outer sheath is shed in early winter and replacement begins immediately. A horn length of 16 inches or longer is considered a trophy, and this horn size does not usually occur until the buck is at least five years old. A trophy antelope will have a Boone and Crockett score of at least 70 points.

Deer and Elk Antlers

Antlers are true bone. The velvet that envelops the growing antler is a modified extension of normal head skin. The growing antler is the fastest growing bone. The antlers grow from permanent bony structures on the skull called pedicels. When antlers are shed, a small segment of the outer portion of the pedicel is lost. This shortening of the outer pedicel, more than the inner portion of the pedicel, causes the antlers' beams to have a greater and greater spread each subsequent year. The seal is the round disk of antler bone that attaches to the pedicel. If the seal on a shed antler is convex, or curved out, the antler size will improve the next year. When the seal becomes flat, the

animal has reached his full potential. If the seal is concave, or curved in, antler quality is declining. Elk antlers in young bulls begin as a spike or with a small fork during their second year of life. The second and third sets of antlers usually have four or five small points on a side. At four -and- one -half years, the bull has a five- or six - point set of antlers, but maximum growth is not reached until after six years.

Antler size in elk increases every year through the sixth set. From seven to 11 years, there is variation in growth. Studies have shown the best trophy antlers can be expected in elk that are younger than 12 years. Certainly, elk younger than seven years of age have not grown their best antlers. We refer to antler growth form as being typical or non- typical. Typical growth form is what is normal for the majority of males of that species. Non-typical growth has extra points or a growth form which is not the norm. For purposes of Boone and Crockett scoring, antlers are categorized as being typical or non- typical.

A trophy set of typical elk antlers has six or more points per side, a spread of 45 inches or more, long tines and heavy mass. A trophy set of elk antlers is generally considered to have a Boone and Crockett score of 330 points or more. Year 2 some outer pedicel is lost Year 1 Year 3 more outer pedicel is lost. Elk antlers in mature bulls begin to regrow as soon as they are cast in February or March. Younger bulls shed and begin growth later. The growing of antlers in elk takes from 80 to 100 days in yearlings and 140 to 160 days in prime bulls. Elk need ample food to grow antlers weighing 20 to 30 pounds in a short period of time. A mature bull elk must consume nearly 16 pounds of dry matter each day to supply the calcium/phosphorus needs to maximize antler growth and maintain body condition.

Considering that the water content of spring forage is 78 percent, the optimal daily fresh food intake of a bull elk could be seventy-three pounds. Typical white-tailed deer antlers have unbranched tines rising from a main beam. Under good environmental conditions, it is not unusual for a yearling whitetail to have three or four points on each side. Typical mule deer antlers fork or branch out. Yearling bucks have spikes or small, branched antlers. Bucks shed their antlers in January or February. Older bucks shed their antlers first, and younger bucks don't shed until March or even April. Antler growth begins a month or so after shedding. Normally, deer will not have their largest sets of antlers until after age five. A typical set of trophy white- tailed deer antlers will have at least four long points on each side and an inside spread of 18 inches. The Boone and Crockett score of a typical trophy whitetail is at least 145 points. A trophy set of typical mule deer antlers is usually considered to be 30 inches or wider and has five long points (including the brow tine) on each side. A mule deer with a Boone and Crockett score of 170 points is considered a trophy.

What about Genetics?

Even though age is the primary factor that prevents bucks and bulls from reaching their full antler or horn potential, many landowners are interested in maximizing trophy potential through genetic selection. Affecting the antler or horn genetics of a population involves increasing the chances that genes related to growing big antlers or horns will show up in the population. This genetic potential can be manipulated only if you can judge the antler or horn potential of bucks and bulls and then increase the reproductive success of the superior animals. This is a major challenge for any landowner. In addition, the impossibility of judging the doe's genetic contribution for antler or horn development adds to the challenge. Landowners should be aware that some harvest

strategies, like shooting only the biggest bucks or bulls, could have a negative effect on trophy potential of the herd. Landowners should control the harvest to prevent more than half of the bucks or bulls with superior traits from being eliminated from the gene pool. Hunters must be able to accurately judge antlers and horns within age classes and concentrate their harvest on the inferior animals within the age group. Don't kill the best mature animals and leave the mature bucks that have smaller antlers to do the breeding. If hunters pass up inferior animals and focus their efforts on superior animals, there may be a negative impact on the overall antler or horn development in the herd.

Should Spike-Horned Animals be removed?

Some people think removing spikes would be good for the herd because they appear to be smaller -antlered animals. However, studies indicate there is little relationship between the first set of antlers and the greatest potential antlers an animal might have. Small first -year antlers might be the result of the buck being a late fawn and barely surviving its first winter. Most of the nutrients that animal consumed would be used to recover from the winter, leaving little nutrition to put into antler development for that year. Small first -year antlers might also be the result of the young buck's mother not taking him to quality foraging areas. Once on his own, the buck is no longer restricted by the foraging behavior of his mother. Removing bucks because they have inferior antlers should not begin until the buck has grown his second set of antlers.

What about Point Restrictions?

Some people suggest that deer and elk should not be harvested until they have at least a certain number of points. The people who embrace this idea think "minimum point restriction" programs will lead to healthier game herds and more trophy animals. Nothing could be further from the truth.

"Healthier Game Herds" Fallacy

The ability to survive and reproduce, escaping both natural and human- related selection factors, is how the best genetics are passed on to future generations. The idea of the "survival of the fittest" is another way to understand this concept. When minimum point restrictions are implemented, we automatically shift a greater chance of survival to the younger, unproven animals and reduce chances of survival for older animals that have proven they have the right characteristics to survive and reproduce. Many hunters that encounter an immature buck would be happy to harvest that animal. Under a point restriction, hunters would be forced to pass up the immature animal and harvest a more mature buck that would be a better animal to leave in the breeding pool. This scenario makes as much sense as a rancher allowing his \$10, 000 prize bull to breed for one year and then taking the bull to slaughter and letting the young, unproven bulls do the breeding.

"More Trophy Animals" Fallacy

A minimum point restriction forces hunters to kill the trophies and pass up the non-trophies. You cannot put the greatest harvest pressure on the trophies and expect to have more of them. Some would argue, "Why do some private lands have so many trophy animals if passing up young animals is so bad?" The reason so many trophies are taken off these areas is that they harvest a very small percentage of their trophies. If trophy production is the goal, never harvest more than 50 percent of the trophy

animals. When landowners take such a small percentage of the trophy population, sufficient trophy animals will remain to ensure a quality gene pool.