

## December 2006 – Is Culling Necessary?

*By: Kip Adams*

Today many hunters are implementing deer management programs aimed at increasing the average age of bucks and the nutritional level for the deer herd. As they begin seeing more 2½ and older bucks, many managers become interested in improving the third piece of the antler formula – genetics. For decades, biologists have debated the practice of improving antler genetic potential by culling or removing specific bucks with undesirable antler traits. The idea is by removing these undesirable bucks you can improve overall antler quality within the deer herd. This idea works well in captivity because you can mate specific bucks to specific does, but is culling an effective strategy for improving the antler quality of free-ranging herds?

First of all, what is culling? Some managers define culling as removing inferior yearling bucks with few antler points (spikes or three-pointers) or missing points such as brow tines. Others define culling as removing older bucks with a low number of antler points (8 points or less) or other undesirable traits such as a narrow spread. For this discussion, we'll define culling as selectively removing bucks with any of these undesirable antler traits from any age class.

Much research has been conducted on this subject, often with seemingly conflicting results. Research from the Kerr Wildlife Management Area in Texas suggested antler quality could be improved by removing spike-antlered yearling bucks. Research from Mississippi State University suggested that yearling bucks' antlers were more a reflection of late birth date and poor nutrition rather than genetics. More current research on state hunting lands in Mississippi suggests that protection of poor-antlered yearling bucks (those with 3 or fewer points) under the state's four-total-point rule has resulted in high-grading, and has produced smaller antlers in older bucks. Current research on the King Ranch in Texas suggests that even aggressive culling on a free-ranging deer herd at the 10,000-acre scale has little impact on antler quality. Confused? Me too.

All of these research projects followed strict methodologies and had statistically significant results. However, there are so many variables involved within a deer herd and its habitat that it is difficult to control for each. For example, different deer herds have different population densities, age structures, sex ratios and nutritional levels (low vs. high). There are differences in soils, supplemental feeding programs, precipitation levels and countless other factors that play a role in a buck's antlers. Therefore, the studies aren't always comparing "apples to apples."

Before you decide which study is most applicable to your specific location, let's look at the breeding ecology of whitetails. For culling to improve the genetic potential of a deer herd's antlers, bucks that are protected must be able to pass their "superior" antler genes to many offspring. Thus, these bucks would have to breed many does and sire many fawns. These bucks' male offspring would require access to high quality nutrition to fully express their antler potential, and they would have to remain in the area for the manager to benefit from his/her efforts.

But do bucks breed many does? It had been widely assumed that a small number of dominant, large-antlered bucks sired most of the fawns. However, current research shows mature bucks don't monopolize breeding rites. Even in populations with good age structure, yearlings and 2½-year-olds sired 15-30% of the fawns in northern and southern studies. Interestingly, some large bucks don't appear to sire any fawns. In Dr. Randy DeYoung's long-term study (over 11 years) bucks averaged less than three fawns per year (this is the number of fawns that survived to six months of age and were recruited into the population). There is also the incidence of multiple paternity. Two studies identified multiple paternity in 22-24% of multiple litters. That means one of

every four to five sets of twins/triplets had multiple fathers! So, dominant bucks don't breed all of the does and they don't even sire all of the fawns from the does they breed!

Since many bucks each do a small amount of the breeding, and since does may breed with multiple bucks, it is impossible to control or even predict which bucks breed which does in the wild. Thus, it is difficult to control the genetic traits you select for (or against) by selectively harvesting bucks based on antler characteristics. And, it is difficult to improve (or degrade) the genetic traits within a deer herd by selectively harvesting bucks based on antler characteristics.

The good news is that we can improve antler size through our harvesting efforts. However, I'm not referring to removing specific bucks. Rather, I'm talking about passing young bucks so they can grow older and have the opportunity to express more of their antler growth potential. This improves the "age" factor of the antler formula and it is extremely easy to do. We can also harvest an appropriate number of does so bucks have more available forage. This, in combination with habitat management, improves the "nutrition" factor of the antler formula. Again, this is easy to do.

It's important to remember that many deer herds have skewed sex ratios, young buck age structures and they exceed their habitat's carrying capacity. In these situations, spikes and small antlers are generally caused by poor nutrition and/or late birth date. These parameters do not allow bucks to express their full genetic potential. We also need to remember that most abnormal antlers are NOT genetically based. Most result from injuries to the skull, pedicle, antler or body, and thus culling would have no effect on the antler genetics of the herd.

Let's revisit the research projects. The results from Dr. Mickey Hellickson's recent culling study in South Texas are likely the most applicable to the average deer manager because of the intensity of the culling efforts and the size of the study area. Mickey and his colleagues intensively culled the smallest antlered bucks in all age classes for six straight years on 10,000 acres on the King Ranch in Texas. When the study was over, the average antler quality per age class was slightly SMALLER than when they started! While factors such as yearling buck dispersal off the study area could partially account for lack of impact, it clearly suggests that even intensive culling on this scale is unlikely to impact genetics.

So, should we be culling "inferior" bucks? If they are young bucks, the answer is 'no' for most of the whitetail's range because they may have been born late or have been nutritionally deprived. If they are older bucks, the answer depends. If you have a surplus of bucks and you really dislike a certain buck – regardless of age - then go ahead and cull him. However, don't expect it to make a big difference in what you see for antlers in the future. He's likely not siring a lot of fawns and of the ones he sires, the doe contributes half to their offspring's antler quality. Also, about 50-75% of yearling bucks disperse one to five miles from where they were born, so an average of  $\frac{1}{2}$  to  $\frac{3}{4}$  of his sons will leave the area anyway. Unless you're involved in a trophy management program with a balanced buck-to-doe ratio, good buck age structure and optimum nutrition, I wouldn't cull him.

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