March 2010

Post-rut Mortality: The Enduring Legacy of the 2009 Drought?

By Aaron Foley, Randy DeYoung, and David Hewitt

Background

The drought of 2009 encompassed some of the driest months on record for much of south Texas, eclipsing even the infamous droughts of the 1950's. Range conditions were visibly bad and many farm fields lay fallow,lacking sufficient soil moisture to plant. Late summer rains brought some relief, but the lingering effects of the drought on south Texas deer populations were visibly apparent in the low fawn:doe ratios and modest antler growth observed across much of the region. The recent rains have brought hope for good fawn production and antler development for 2010. However, the legacy of the 2009 drought may have a lingering effect on south Texas bucks.

Natural death rates of south Texas bucks are highest during their first 2 years of life, when many are lost as fawns and during dispersal. Young bucks lucky enough to live until 3 years have a good chance of surviving to old age if they can evade harvest. The only exception is the post-rut, where a series of radiotelemetry studies by Dr. Mick Hellickson and Dr. Charles DeYoung revealed that natural death loss of adult bucks is most likely to occur during the post-rut period. During the rut, bucks eat little and rely largely on fat reserves to sustain them while they devote all their waking hours to searching for estrous does. As many hunters know, bucks can lose up to 30% of their body weight during the breeding season. After the rut, bucks are exhausted and in poor condition, in need of energy to replenish the lost fat reserves. If bucks have pushed the envelope too far during the rut, their survival is at risk.

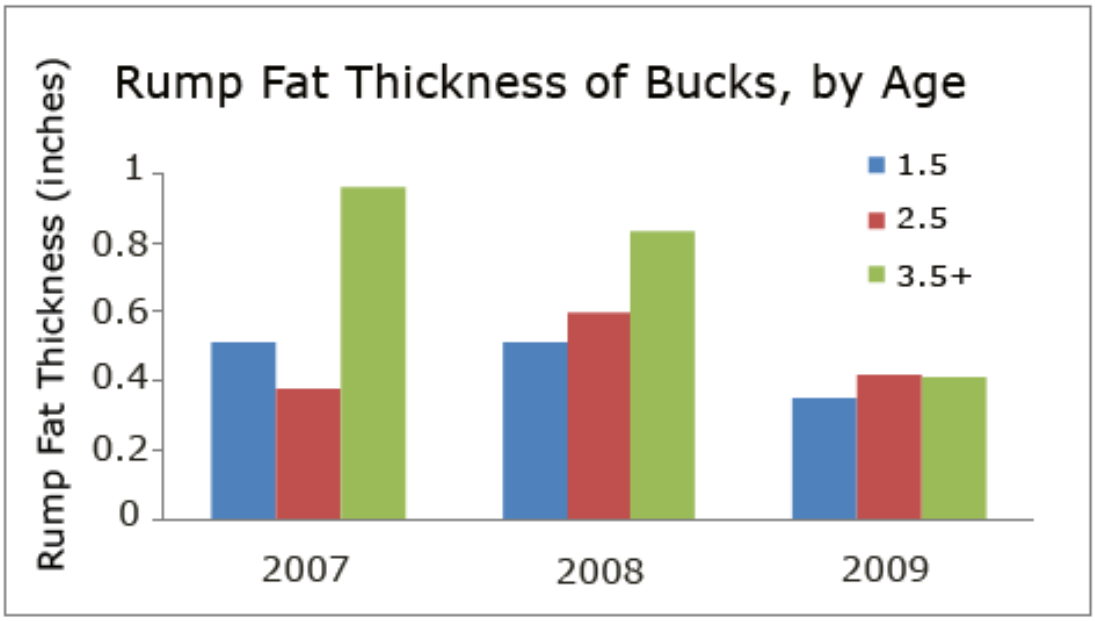
Methods

As part of a study funded by Texas Parks and Wildlife Department, Quality Deer Management Association, and the National Fish and Wildlife Foundation, we have captured and radiocollared 24-34 bucks annually since 2007. We capture during late October or early November, and retrieve the collars and stored GPS locations during late February or early March. Peak rut occurs during early December, so we monitor bucks from pre-rut, when bucks are in their best condition until post-rut when bucks are at their lowest ebb. We use a relatively new technique to index pre-rut body condition:

measuring rump fat using a portable ultrasound. Rump fat is an excellent indicator of body condition for live deer because it accurately reflects total body fat.

Results

Thickness of rump fat varies by year and by age of the buck. Average rump fat is greater during years with good spring and summer rains, as bucks enter the rut in excellent condition. Yearling and 2-year old bucks have less rump fat than older bucks because young deer are still growing. Mature bucks typically have the greatest fat reserves, providing them the energy they need to successfully chase, court, and tend estrous does during the rut.



We caught 34 bucks during fall 2007, a year with above-average summer rains. Rump fat thickness averaged nearly 1" for mature bucks and 0.4" for 2-year olds; only 1 buck died, a 4-year old in late December. We caught 33 bucks during 2008. Again, we saw no post-rut deaths, but drier conditions in 2008 caused average rump fat for mature bucks to decline to 0.85", while 2-year olds came in at 0.6", possibly a carryover from the wet year before. As many of us remember well, most of 2009 was very dry. We caught 24 bucks; rump fat for Enews2_03_10.gifmature bucks was a paltry 0.42" and 2-year olds fell back to 0.4". Six of 24 bucks died during post-rut: 1 of 2 yearlings, 3 of 8 2-year olds, and 2 of 14 mature bucks (aged 3 years and older). Four of the bucks that died had average or below average rump fat thickness (0.16 to 0.39"). Deaths were not limited to individuals with below-average rump fat, however, as yearling and 2 year old bucks with rump fat of 0.5 and 0.7" also died.

Conclusions

The 2009 season was certainly different than previous years, both in terms of weather and buck deaths. We can't determine the exact cause of death, but several of the dead bucks had little bone marrow fat, indicating starvation. In addition to the drought, post-rut weather was unusually cold and damp. Whether from drought or a combination of drought followed by wet and cold weather, we may still be feeling the aftereffects of 2009. The condition of bucks entering the rut might influence post-rut mortality several months later, or cause bucks to be more susceptible to unusual weather conditions. Therefore, management actions that provide high-quality foods during summer and fall are important. Although we were not able to test the idea directly, high-energy foods during the post-rut period may help bucks recover from the lingering effects of the rut. Finally, harvest management should consider the potential for higher natural mortality following dry years.

About the Author: Aaron Foley is a Ph.D. student at Texas A&M University-Kingsville working under Drs. Randy DeYoung and David Hewitt.

Research Collaborators: Mickey Hellickson - King Ranch, Inc., Ken Gee - Samuel Roberts Noble Foundation, and Mitch Lockwood - Texas Parks & Wildlife Department work with the Caesar Kleberg Wildlife Research Institute on this research project.