Jocelyn Miller

Louisiana State University

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Managing White-tailed Deer in the Face of Climate Change

As the foundation of the hunting industry in the United States, proper management of white-tailed deer (*Odocoileus virginianus*) is a top priority for local and federal policy makers, especially in the Southeast where deer herds are most abundant (Quality Deer Management Association 2012). Recent advances in the study of climate change indicate a need for current and future impacts of climate change to be included in Quality Deer Management (QDM) programs. Climate change has the potential to affect deer populations in several ways. The direct impacts would obviously be a rise in average temperature and annual rainfall—both of which have the potential to affect populations either positively or negatively—while indirect factors include future economic decisions in the fuel and agriculture industries.

Despite the recent push to replace the term “global warming” with “climate change,” the majority of Americans continue to associate the phenomenon primarily with rising temperatures. This is, of course, still an important aspect of climate change to consider in the development of future deer management plans. Warmer winters would mean more readily available food and less energy spent on shivering, possibly leading to higher survival rates. In addition to increasing deer survival rates, warmer temperatures might also mean a greater chance of parasites and predators surviving through the winter. Many deer populations rely on cold winters to purge their habitat of biting insects that may transmit diseases. For example, Hemorrhagic Disease, caused by midges and flies, cannot be controlled by human means and the prevention of outbreaks relies entirely on cold winters to kill off infected insects (QDMA 2012). If winter temperatures rise to a level that allows some insect species to survive and continue parasitizing deer year-round, it is possible that deer herd size and/or fitness will be reduced. According to the Quality Deer Management Association, coyote populations have had a significant impact on fawn survival rates in recent years. Fawn recruitment in 2010 was only 0.6 fawns per doe in the southeastern states (QDMA 2012). Unless future deer management programs include methods to balance hunting pressure with an increase in natural predation and outbreaks of disease, deer populations may suffer additive mortality in years to come.

Another direct impact of climate change is an overall increase in precipitation. Current models project up to a 20% increase in precipitation in the north, annually, and up to 30% in the winter (Christensen *et al.* 2007). However, those same models predict a net drying effect in the central and southern states (due to increased evaporation from higher temperatures), and only about a 5% increase in annual rainfall in the eastern states. Increased rainfall could improve mast production in areas commonly browsed by deer, thus boosting population sizes and allowing more harvests. Contrarily, areas affected by a net loss of rainfall due to increased evaporation may require smaller quotas as deer will likely suffer from reduced browse availability.

The influence that the economy has over climate change often goes unnoticed by those discussing its effects. Whether the United States decides to encourage the switch from fossil fuels to renewable energy sources, or advocates the continued (or expanded) use of limited, CO2-producing energy sources, will determine the rate of climate change for generations to come. The race to develop new, cleaner fuels has resulted in a recent boom in the natural gas industry (QDMA 2012). Drilling and hydraulic fracturing (“fracking”) in forested areas has become a more common occurrence since many civic ordinances have banned the practices within cities. QDMA supports the search for cleaner energy, but also encourages managers and land owners to take the necessary steps to ensure that the land is reclaimed by vegetation that is useful to deer populations. Agriculture has also been boosted by the search for new energy sources, as evidenced by the steady increase of corn fields in the last decade, culminating in just under 100 million acres of corn planted in 2012 (NASS 2013). Corn, along with the other major cash crops in the United States (soybeans, cotton, and wheat), can be a valuable food source to deer herds; and clear cutting resets forests to early succession stages in which deer thrive. However, as demand for more ethanol and food products increases, more land will have to be allocated to farming rather than forested deer habitat, and populations will be reduced or fragmented.

Overall, the obvious answer to the question “Should climate change be considered in the development of deer management plans in the Southeast?” is a resounding “Yes.” However, it is still unclear as to which direction deer populations will go in response to climate change. A change in weather patterns is just one of many complicated products of climate change and further research, experimentation, and careful observation of climate change, the economy, and individual deer herds will be crucial to the development of effective management strategies in the future.

References

Adams, K., J. Hamilton, M. Ross (2012) *QDMA’s* *WhitetailReport 2012*. 2-44. <http://www.qdma.com/uploads/pdf/WR2012.pdf>

Christensen, J.H., B. Hewitson, A. Busuioc, A. Chen, X. Gao, I. Held, *et al.*, 2007: Regional Climate Projections. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

National Agricultural Statistics Service. (2013). <http://www.nass.usda.gov/Charts_and_Maps/Field_Crops/cornac.asp>