Population Modeling, Space-Use, and Cause-Specific Mortality of White-tailed Deer (*Odocoileus virginianus*) in the North Georgia Mountains

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White-tailed deer (*Odocoileus virginianus*) populations on 8 Wildlife Management Areas (WMAs) on Chattahoochee National Forest in northern Georgia, USA have declined substantially during the past 36 years. Harvest has declined by 85% and 97% for antlered and antlerless deer, respectively [1]. Georgia Department of Natural Resources-Wildlife Resources Division restricted harvest of antlerless deer, but populations have failed to recover. However, deer condition indicators (i.e., body mass and antler measurements) have improved during this same period [1], suggesting improved nutritional conditions. Acorn (*Quercus* spp.) mast production is an important seasonal resource for deer, black bears (*Ursus americanus*), and feral pigs (*Sus scrofa*) in this region [2][3]. Populations of black bears, coyotes (*Canis latrans*), bobcats (*Lynx rufus*), and feral pigs have increased which could influence fawn survival and habitat use by deer and thus fawn survival may be a limiting factor in long-term population sustainability. We will capture and GPS collar 90 adult female deer to investigate space use and survival (2018-2020) on Blue Ridge and Cooper’s Creek WMAs in the north Georgia mountains. Additionally, in a concurrent study we will capture and collar (VHF) 120 neonates to monitor their survival to 16 weeks of age during 2019-2020. We will estimate survival rates for both fawns and adult does using the Kaplan-Meier estimator for the generalized staggered entry case. Subsequently we will simulate population growth under various harvest management regimes using parameters collected in our study area and for similar deer populations in the southeastern United States. In addition, we will monitor space-use of adult female deer throughout the year. We will evaluate annual and seasonal home range size and habitat selection using dynamic Brownian bridge movement models and resources selection functions. Finally, we will establish one 3,000-ha passive camera grid on each WMA (camera density of 1/50 ha) to examine the occupancy of fawns, adult deer, feral pigs, bears, bobcats, and coyotes. We will investigate occupancy during white-tailed deer parturition, lactation, mast production, the rut, and hunting seasons. The results of this study will help determine population vital rates for deer in the region and allow informed decisions to potentially reverse population declines of deer in the region.

References