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# NORTHERN BOBWHITE SURVIVAL AND PRODUCTIVITY IN RELATION TO FOOD SUPPLEMENTATION

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## ABSTRACT

Northern bobwhite (*Colinus virginianus*; hereafter, bobwhite) populations have experienced a 3.4% decline annually nationwide from 1966 to 2018. Limitations on resources, such as food, can regulate population growth. Supplemental food could alleviate resource limitation by raising carrying capacity, leading to increased survival and breeding productivity. Studies have shown higher survival rates and higher nest production when food is supplemented; however, repeating experiments in different contexts allows for strong inference. Our objectives were to assess how supplemental food influenced survival and breeding productivity of resident and translocated bobwhite during a 2-year study on public lands in Leon County, Florida, USA within the Apalachicola National Forest. In accordance with the food limitation hypothesis, we predicted that provisioning of supplemental food would have a positive influence on survival rates and nest productivity. We split the study site into 4 approximately 400-ha zones and randomly assigned 2 treatment (fed) and 2 control (unfed) replicates. Treatment and control zones were flipped during the second field season. Treatments received approximately 1.75 bushels of milo (*Sorghum bicolor*) acre 2 times/month year-round via broadcast spreader. We radio-marked 205 bobwhites (102 treatment, 103 control) from February 2019 through October 2020. Individuals were tracked 3–4 times/week for location and survival via radio-telemetry to estimate the breeding season survival and reproduction rates. We estimated survival rates using the Kaplan-Meier product limit estimator. The survival rate during the breeding seasons was higher on average for treatment zones ( $\bar{x} = 0.38$ , standard error [SE] = 0.040) than for control zones ( $\bar{x} = 0.29$ , SE = 0.045). We also observed that 79% of nests found were located in treatment zones compared to 21% in control zones. Our results suggest that food supplementation can improve survival rates and nest production of bobwhite in a food-limited landscape.

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**Key words:** *Colinus virginianus*, food limitation, limiting factor, northern bobwhite, public land, translocation

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