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Estimating Northern Bobwhite Density in Privately-Owned Forests Across the Southeast

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ESTIMATING NORTHERN BOBWHITE DENSITY IN PRIVATELY OWNED FORESTS ACROSS THE SOUTHEASTERN UNITED STATES

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ABSTRACT

Rigorous density estimates can inform management, conservation planning, and policy decisions. Northern bobwhite (*Colinus virginianus*; hereafter, bobwhite) populations are declining throughout their range, including the southeastern United States. Numerous private land conservation initiatives are underway to restore bobwhite populations in these areas, but baseline estimates of density spanning privately owned forests are sparse. This information gap makes it difficult to evaluate the population-level effects of these conservation programs or develop expectations for timelines to reach population targets. We sought to understand baseline densities across privately owned pine forests in the southeastern United States in areas targeted for bobwhite conservation. We sampled 138 pine stands a total of 286 times across Alabama, Florida, Georgia, North Carolina, and South Carolina from 2018 to 2020 using autumn distance sampling point counts. We sampled 110 stands that were either planned or applied U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) management contracts, specifically Working Lands for Wildlife (WLFW) Northern Bobwhite partnerships or similar Environmental Quality Incentives Program contracts. The WLFW contracts were solely in focal counties identified in the National Bobwhite Conservation Initiative 2.0 plan and by cooperating state wildlife agencies. Contracts were on average 17.4 ha (SD = 27.0). We also sampled 28 areas with extensive (>200 ha) and intensive (e.g., at least every 3 years for the last ~10 years) habitat management for bobwhite. We used a hierarchical distance sampling model to estimate density. Density was lowest in North Carolina and South Carolina. Densities in Alabama were slightly greater, and greatest densities were in Georgia and Florida. However, the majority of observed densities were 2 coveys/40 ha or below, and all were below 4 coveys/40 ha. Large and intensively managed sites on average had 4 times greater density compared to smaller contracts. Specific densities will be reported in the future. Our sampling efforts fill an important information gap regarding densities throughout private lands in the southeastern United States. Our models indicate that bobwhite densities are generally low in pine forests of the Southeast even in counties identified as having the greatest conservation potential. The relatively greater densities at large and intensively managed sites illustrate the need for more intensive landscape-scale planning when implementing private land conservation. Pending research will compare densities at planned and applied NRCS contracts in the context of landscape-scale habitat amount.

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Key words: broad-scale monitoring, *Colinus virginianus*, density, northern bobwhite population assessment, southeastern United States

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