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BEHAVIORAL STATE-SPECIFIC NORTHERN BOBWHITE CHICK RESOURCE SELECTION

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ABSTRACT

Determining resource selection rates for all life stages of a species is critical to enable a holistic management approach that focuses on bolstering populations across all life stages. Moreover, tying these selection rates to specific life history needs (e.g., foraging, roosting, and loafing) can provide valuable information to guide management practices. Northern bobwhite (*Colinus virginianus*; hereafter, bobwhite), a gallinaceous species of North America, has experienced steady population declines throughout much of its range over the last 50 years. Although the species has been well studied, chick ecology is still relatively unknown. We studied bobwhite chick resource selection on a private property in Brunswick County, North Carolina, USA to better understand daily and within home range selection. The site was managed intensively for bobwhite using prescribed fire, seasonal mowing and disking, mesomammal control, and supplemental feeding. We radio-tagged 156 chicks 11–15 days of age from 29 unique broods and collected location data for nocturnal roost sites, daily movement tracks, and diurnal use sites during a 2-year span. We had selection models for 3 behaviors: roosting, foraging, and general movements within home range (third-order). All models were mixed-effects conditional logistic regression models under a Bayesian framework. We determined foraging behavior using a straightness index for daily track segments; more tortuous segments were designated as foraging locations. Upland pine stands (burned and unburned) were selected for foraging and roosting. Chicks were more likely to select areas closer to feedlines for roosting, foraging, and diurnal habitat; however, selection of these areas decreased as birds grew older. Chicks avoided fallow fields and hardwood drains or Carolina bays as roost site locations yet selected them as foraging habitat. Roosting birds avoided fallow fields as roost sites and instead selected areas adjacent to them. Probability of use for diurnal and roosting habitat decreased as distance to fallow fields increased. Our study results shed light on how circadian habitat use can vary and illustrate that one specific land cover may not provide ideal diurnal and nocturnal habitat for bobwhite chicks. The results also reinforce the need to provide resources that meet diurnal and nocturnal requirements within biologically reasonable distances from each other.

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Key words: *Colinus virginianus*, chick, fallow field, foraging, northern bobwhite, precocial, radio-telemetry, resource selection, roosting

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