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# EFFECTS OF FIELD BORDERS AND MESOMAMMAL REDUCTION ON NORTHERN BOBWHITE AND SONGBIRD ABUNDANCE ON THREE FARMS IN NORTH CAROLINA

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## ABSTRACT

Lack of early nesting habitat may be limiting population levels of northern bobwhites (*Colinus virginianus*) and early successional songbirds on agricultural landscapes. Alternatively, detrimental effects of mesomammal predators on nesting success and survivorship of bobwhites may be causal at low densities. Previous research has documented increased use of agricultural areas by bobwhites on farms with field borders, but bobwhites had low nesting success in these areas. No replicated studies in the southeast United States have been conducted investigating the effects of field borders and mesomammal predator reduction on bobwhite and songbird abundance. We conducted a 3-year study on farms in Hyde, Tyrrell, and Wilson counties, North Carolina using a  $2 \times 2$  factorial treatment combinations and a blocked study design. On each study area, 4, 200-ha farm blocks were randomly assigned 1 of 4 treatments. Treatments included: (1) 5–10 m fallow vegetation borders on all disked field edges, (2) removal of mesomammal nest predators (raccoons (*Procyon lotor*), opossums (*Didelphis virginianus*), and foxes (*Urocyon cinereoargenteus* and *Vulpes vulpes*)) between January through June of each year, (3) a combination of field borders and predator reduction, or (4) neither treatment. In 1997–99, we measured fall abundance of bobwhite coveys on farm blocks using morning covey call surveys and summer abundance of songbirds using variable radius point counts. Field borders were established in 1996 in Hyde and Wilson counties and 1997 in the Tyrrell county study area. Number of mesomammal predators annually removed from farm blocks averaged 42 (SE = 3.5) and was similar between study areas and years. Field border farm blocks had consistently more coveys heard than non-border farm blocks ( $F_{1,2} = 216.0$ ,  $P < 0.004$ ). However, there were no differences in the number of coveys heard between predator reduction and non-reduction farms ( $F_{1,2} = 10.4$ ,  $P = 0.084$ ). Farms with both field border and predator reduction had more coveys heard compared to other farm blocks ( $F_{1,2} = 43.3$ ,  $P < 0.0223$ ). Summer bobwhite abundance was greater on field border areas ( $F_{1,6} = 5.93$ ,  $P < 0.051$ ). No other differences in songbird abundance were detected between field border and non-border farms. In 1997, songbird nest density was estimated in field border and non-border farms on the Wilson County study area. Field border farms had higher nest density, particularly for field sparrows (*Spizella pusilla*) and common yellowthroats (*Geothlypis trichas*), and had greater nesting bird diversity. Field borders were a practical technique to increase bobwhite abundance on small farm blocks. Increases in bobwhite abundance associated with predator reduction on small farms with field border would not be economically feasible in most circumstances.

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