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# IMPACTS OF HABITAT FRAGMENTATION ON NORTHERN BOBWHITES IN THE GULF COAST PRAIRIE LANDSCAPE CONSERVATION COOPERATIVE

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## ABSTRACT

The northern bobwhite (*Colinus virginianus*) has experienced range wide declines over the last several decades, primarily due to loss and fragmentation of habitat. As populations decline, there is a need for understanding factors that impact bobwhite population persistence at local and regional spatial scales. Our goal was to assess changes in land use and their relationship to bobwhite declines at 3 different spatial scales (region, county, and home range) in Texas, Oklahoma, and Louisiana. We used North American Breeding Bird Survey (BBS) data from 1974-2014 to create abundance maps and trends. At the regional scale, we compared bobwhite abundance with road density (2000, 2010), human population (1970-2010), and land use (1974-2012). We then used the BBS data to identify counties with stable and declining bobwhite abundance, and then compared bobwhite abundance to land use at metapopulation (800-9600 ha) and home range scales (15 ha). Bobwhite populations decreased from  $45.93 \pm 1.01$  birds/count in 1970 to  $11.55 \pm 0.64$  birds/count in

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2012. as road density and human population increased. Pasture and other land increased, woodland was relatively stable, and cropland decreased in 2012. At the metapopulation level, declining populations had higher road density, more edge and patch area for pasture, and larger patches of cropland compared to stable populations. At the home range scale, declining populations had significantly fewer, and smaller, woody patches, more herbaceous habitat, and less bare ground. This study demonstrates that while on a small scale managers can provide woody cover and reduce cropland effects to support stable populations, the large-scale drivers of bobwhite decline, namely human population growth and the resulting loss of habitat, will be critical to quail management in the future.

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**Key words:** Breeding Bird Survey, *Colinus virginianus*, habitat fragmentation, land use, northern bobwhite