

2017

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Recommended Citation

Klopfer, Scott D.; Cross, Daniel A.; McGuckin, Kevin; Howell, Jay E.; and Puckett, K. Marc (2017) "Evaluating Temporal Differences in Land Cover: Implications for Managing Bobwhite at the Landscape Scale in Virginia," *National Quail Symposium Proceedings*: Vol. 8 , Article 42.

Available at: <https://trace.tennessee.edu/nqsp/vol8/iss1/42>

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EVALUATING TEMPORAL DIFFERENCES IN LAND COVER: IMPLICATIONS FOR MANAGING BOBWHITE AT THE LANDSCAPE SCALE IN VIRGINIA

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ABSTRACT

Northern bobwhite (*Colinus virginianus*) populations have declined substantially across large portions of their range. A number of factors may be contributing to that decline including disease, predation, pesticides, and habitat loss. Of these, habitat loss has emerged as the primary factor. Habitat loss has occurred at large and small scales. It is relatively easy to evaluate bobwhite habitat at the micro scale, but evaluating habitat change at the landscape scale is difficult. The goal of this pilot study was to evaluate a novel technique using aerial imagery and line transects to evaluate both contemporary and historic landscapes effectively, quantifying the differences observed to describe what changes, if any, occurred through time. Contemporary photos were available through the 2013 Virginia Base Mapping Program. Historic photos were obtained via United States Geological Survey (1967 – 1969). Two Virginia Quail recovery Initiative focal counties were chosen for the study, Halifax (south central Piedmont) and Sussex (southeastern Coastal Plain). A 12-class habitat categorization system was developed to use in analysis. We developed a technique that allowed photo interpreters to identify and delineate features at a large scale (> 1:6000) over a wide geographic area. Thirty-five to forty transects were evaluated for each site (n = 7). Favorable habitat decline observed ranged from -2% to -49%. Favorable edge decreased through time in four of five sites in Halifax County. Favorable edge increased dramatically within both Sussex County sites, particularly in the bobwhite focal area. Overall, habitat appears to have improved in Sussex County, and declined significantly in Halifax County. Habitats differed both through time and across the landscape. The largest habitat change noted was conversion from field to forest, predominantly pine. We feel this landscape scale habitat analysis technique holds much promise across the bobwhite's range.

Citation: Klopper, S. D., D. A. Cross, K. McGuckin, J. E. Howell, And K. M. Puckett. 2017. Evaluating temporal differences in land cover: implications for managing bobwhite at the landscape scale in Virginia. National Quail Symposium Proceedings 8:147.

Key words: *Colinus virginianus*, landscape, Halifax County, Sussex County, habitat creation, historic, contemporary, aerial photos, line transects, novel technique

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