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Scott D. Klopfer
Virginia Tech

Daniel A. Cross
Virginia Tech

Kevin McGuckin
Versar, Inc.

Jay E. Howell
Virginia Department of Game and Inland Fisheries

K. Marc Puckett
Virginia Department of Game and Inland Fisheries

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

Scott D. Klopfer¹

Conservation Management Institute, College of Natural Resources and Environment, Virginia Tech, 1900 Kraft Drive, Suite 250, Blacksburg, VA 24061-0534, USA

Daniel A. Cross

Conservation Management Institute, College of Natural Resources and Environment, Virginia Tech, 1900 Kraft Drive, Suite 250, Blacksburg, VA 24061-0534, USA

Kevin McGuckin²

Versar, Inc., 9200 Rumsey Road, Columbia, MD 21045, USA

Jay E. Howell

Virginia Department of Game and Inland Fisheries, 3310 Forest Edge Court, Apt. F, Henrico, VA 23294, USA

K. Marc Puckett

Virginia Department of Game and Inland Fisheries, 107 Foxwood Drive, Farmville, VA 23901, USA

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.

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

¹Email: sklopfer@vt.edu

²Present address – 174 Blue Grass Trail, Newport, VA 24128, USA

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