

MS Thesis
Department of Environmental Science and Policy
George Mason University

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Defense Date and Time: April 18, 2016 @ 3:00pm

Defense Location: Exploratory Hall 1005

Title: The Effects of Habitat Fragmentation and Habitat Management in the Piedmont, Northern Virginia

Thesis Director: Dr. Julia Nord

Committee: Dr. Thomas Wood, Dr. David Luther

ABSTRACT

The Piedmont Physiographic Province of Northern Virginia to the west of the Washington DC suburbs represents a conserved landscape. This study examines the importance of riparian zones in the Northern Piedmont for conserving large vertebrate species. From the perspective that biodiversity decreases with increasing habitat fragmentation and human disturbance, camera traps were used to detect species diversity in three riparian areas of varying forest fragmentation and human use. Species diversity was measured by calculating species richness and evenness across the three study areas. Data was collected over a 71 day period (July 1st through September 10th 2015) by 8 cameras with a total of and 918 species images. All three sites were in forest and farm areas of Fauquier County. Site 1, the Field Station, had moderate forest fragmentation and some human disturbance; Site 2, Conservancy, represented intact habitat with almost no direct human disturbance; and Site 3, Working Farm, had high habitat fragmentation a the greatest degree of direct human activities. Species diversity was calculated using several models including Jaccard Index, Whittaker Index, Simpson Index, Shannon-Wiener Index, Relative Abundance Index and True Diversity (Effective Number of Species). The Conservancy (Site 2) was the most biologically diverse, but the Field Station (Site 1), had the greatest number of species detected. The Working Farm (Site 3) as expected, was the least diverse. These results support other published data indicating direct human disturbances (which includes human activities and habitat fragmentation) results in decreased detection of large vertebrate diversity.