PhD Dissertation
Department of Environmental Science and Policy
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Title: Conservation and Land Management Practices and Their Impact on Sustaining Breeding and Non-Breeding Grassland Bird Populations in the Southeast

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ABSTRACT

Birds that depend on grass and shrubland habitats for survival are experiencing a greater decline than any other avian assemblage in North America. Habitat loss and degradation on both breeding and wintering grounds are among the leading causes of these declines, though research on wintering bird communities throughout the Americas is limited. In my dissertation I explored the response of breeding and wintering grassland bird communities to conservation and land management in the eastern US. Using point count survey data collected through a regional citizen science program, Virginia Working Landscapes, I used statistical models to predict breeding grass and shrubland bird abundance based on habitat and landscape composition. Shrubland birds exhibited increased densities in fields managed through the Virginia Quail Recovery Initiative, a targeted habitat program directed towards the conservation of Northern Bobwhites (*Colinus virginianus*). In contrast, grassland-obligate avian species exhibited higher breeding densities in fields managed as hayfields and pastures. Results indicate that quail habitat management can be promoted as a tool to conserve habitat for early successional songbirds, but not grassland species. However, grassland fragmentation may be influencing the response of grassland birds to quail management and therefore requires further investigation. To explore how these habitats influence avian communities during the non-breeding period, I used transect data to identify differences in wintering species richness and diversity between fields comprised of native warm-season grasses (WSG) and fields comprised

of non-native cool-season grasses (CSG). WSG fields had higher species richness and diversity than CSG fields. In addition, timing of field management influenced bird communities, with fields managed in summer or fall months exhibiting lower avian abundance than those managed in the winter or not at all. For my final chapter, I used data collected from a national citizen science program, eBird, to create an occupancy model for a declining grassland bird, the Loggerhead Shrike *(Lanius ludovicianus).* The occupancy model revealed important species-environment relationships that can be used to predict shrike occurrence throughout the southeastern portion of the US. Though open country habitats were the main driver of occupancy year-round, seasonal changes in distributions were driven by temperature and percent forest cover in the landscape, indicating a potential tradeoff of predation risk for increased cover from harsh weather in winter. The results of this work demonstrate how conservation and land management influence avian communities in eastern grasslands on multiple spatial scales during breeding and non-breeding seasons. These findings can be used to improve best management practices of grasslands to optimize habitat quality for declining species throughout the full annual cycle.