Habitat relationships of forest and early successional bird communities in Iowa

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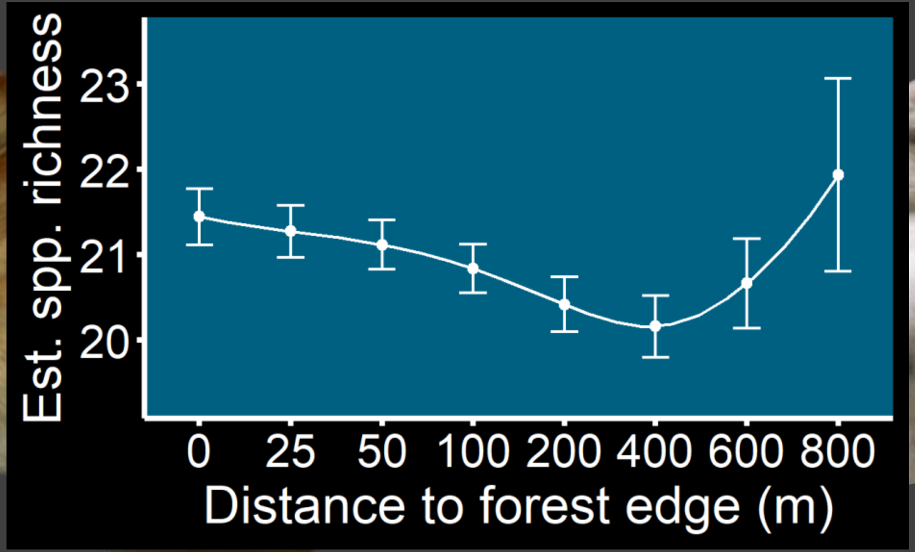
Introduction

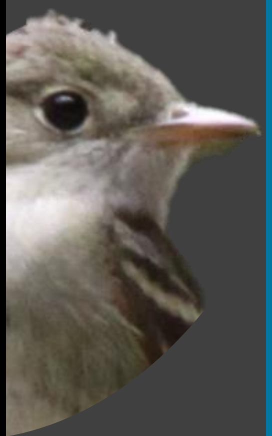
With recent declines in avian populations, it is important to **identify areas of high avian diversity and to determine habitat characteristics associated with that diversity**. Our study focused on breeding bird communities **three Bird Conservation Areas in south-central Iowa**; these areas are **primarily forested** but also contain successional and agricultural habitats. Our primary goals were to **1) compare species richness estimates which do and do not consider imperfect detection probability**, and **2) determine relationships between species diversity and habitat metrics.**

»We detected **77 breeding bird species** meeting several criteria needed for analysis, **24 were listed as Iowa Species of Greatest Conservation Need.**

» **Point-scale species richness estimates** accounting for imperfect detection **(range = 16.7 to 25.7)** were, on average, **7.7 species higher** than species richness calculated from raw data.

» **Bird species richness was related to habitat at multiple spatial scales;** related metrics included landscape-scale forest cover at a 10 km scale (+), tree species richness (+), and leaf litter cover (-). Both **forest edges and interior forests had high species richness (see figure below).**





» We recommend management practices in this area that **preserve interior forest habitat, maintain or increase landscape-scale forest cover**, and that any selective harvests **maintain tree species richness** at a site by not completely eliminating any tree species.

Methods

Distance sampling bird point surveys (493 points, 3,944 surveys) were arranged in grids with 300 m spacing. Surveys had 10 min. duration and 100 m truncation. They occurred **May-Aug for four years (2016-2019)** with two visits per point per year.

Vegetation surveys were conducted at the bird survey points, from Jul-Aug 2019. **Landscape scale forest cover** was derived from the National Cropland Data Layer, and **forest patch boundaries were digitized** from aerial imagery.

Hierarchical distance sampling models in R package ‘unmarked’ were used to calculated occupancy probability (ψ) at each point for each year. **Values of ψ were summed to estimate species richness** for each year at a point, and years were averaged. **Estimated species richness was related to habitat metrics using linear regression.**

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