

# Assessing habitat for south-central Iowa’s breeding birds

Benjamin M. West and Stephen J. Dinsmore  
Iowa State University,  
Natural Resource Ecology and Management

## Introduction

Iowa forests provide habitat for **74 breeding birds** designated as **Species of Greatest Conservation Need (SGCN)**. In an effort conserve bird populations, Partners in Flight and the Iowa Dept. of Natural Resources (DNR) established **Bird Conservation Areas (BCAs)** in habitats across Iowa (Iowa DNR 2010). This project focuses on **forests in three BCAs in south-central Iowa**; it aims to **inform forest management to positively impact bird communities**.

## Field Methods

The **study area** was publicly owned “cores” of three Bird Conservation Areas in south-central Iowa: **Sand Creek WMA** and multiple units of **Stephens State Forest** (Fig. 1)

**Bird point count** stations were arranged in grids with 300 m spacing (**503 points total**). Point count **surveys were 10 minutes long and within a 100 m radius**, stratified by both time and distance. They occurred **May-Aug for four years (2016-2019)**. There were two visits per point per year.

**Vegetation surveys** were conducted at the **same locations as the bird surveys**, and were performed Jul-Aug 2019 (Fig. 2). We used a 1-meter factor prism sample for **basal area, tree species richness**, and **proportion of trees of genus *Quercus***. We used a GRS densitometer along two perpendicular 20 m transects to assess **canopy closure** and **ground cover**. We counted **shrub stems** within two 22.6 m x 1.8 m strips. We took photos to assess **mid-story foliage density** (Fig. 2.).

## Preliminary Results

- **Top five SGCNs** by # of detections across all four years:
  - 1) **Eastern Wood-Pewee** (n = 3,333)
  - 2) **Common Yellowthroat** (n = 1,698)
  - 3) **Field Sparrow** (n = 1,021)
  - 4) **Yellow-billed Cuckoo** (n = 845)
  - 5) **Northern Flicker** (n = 700)
- **Tree density** seems to be an **important predictor of the distributions** of some species (Fig. 3).

## Future Directions

- I will us community-scale hierarchical distance sampling and removal model with habitat covariates to:
  - 1) Estimate **bird densities within each BCA**
  - 2) Assess **relationships between individual bird species density and habitat characteristics**
  - 3) Assess **relationships between bird community diversity and habitat characteristics**.
- I will perform **mid-story photo analyses** and obtain **landscape-scale habitat covariates**

**Eastern Wood-Pewees** (a forest bird) were usually detected at sites with **greater density of live trees**.

**Field Sparrows** (an open area bird) were generally detected at sites with **lower density of live trees**.

**Upcoming analyses** will estimate **bird densities**, include **more bird species**, and have **more habitat characteristics**.

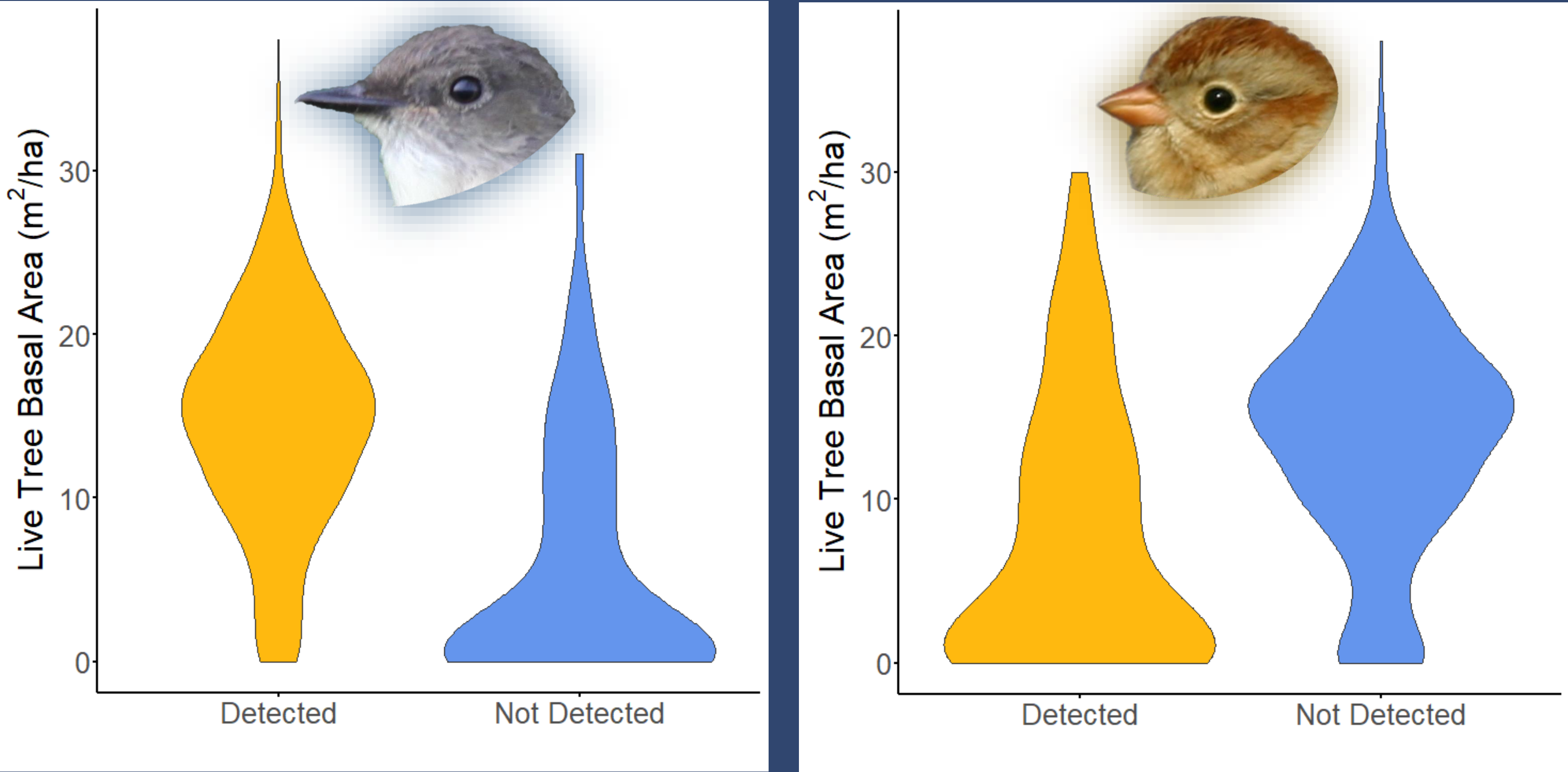


Figure 3. Violin plots comparing the distributions of live tree basal area as they relate to detections/non-detections of the Eastern Wood-Pewee (left plot) and Field Sparrow (right plot) in south-central Iowa during the 2019 breeding season.

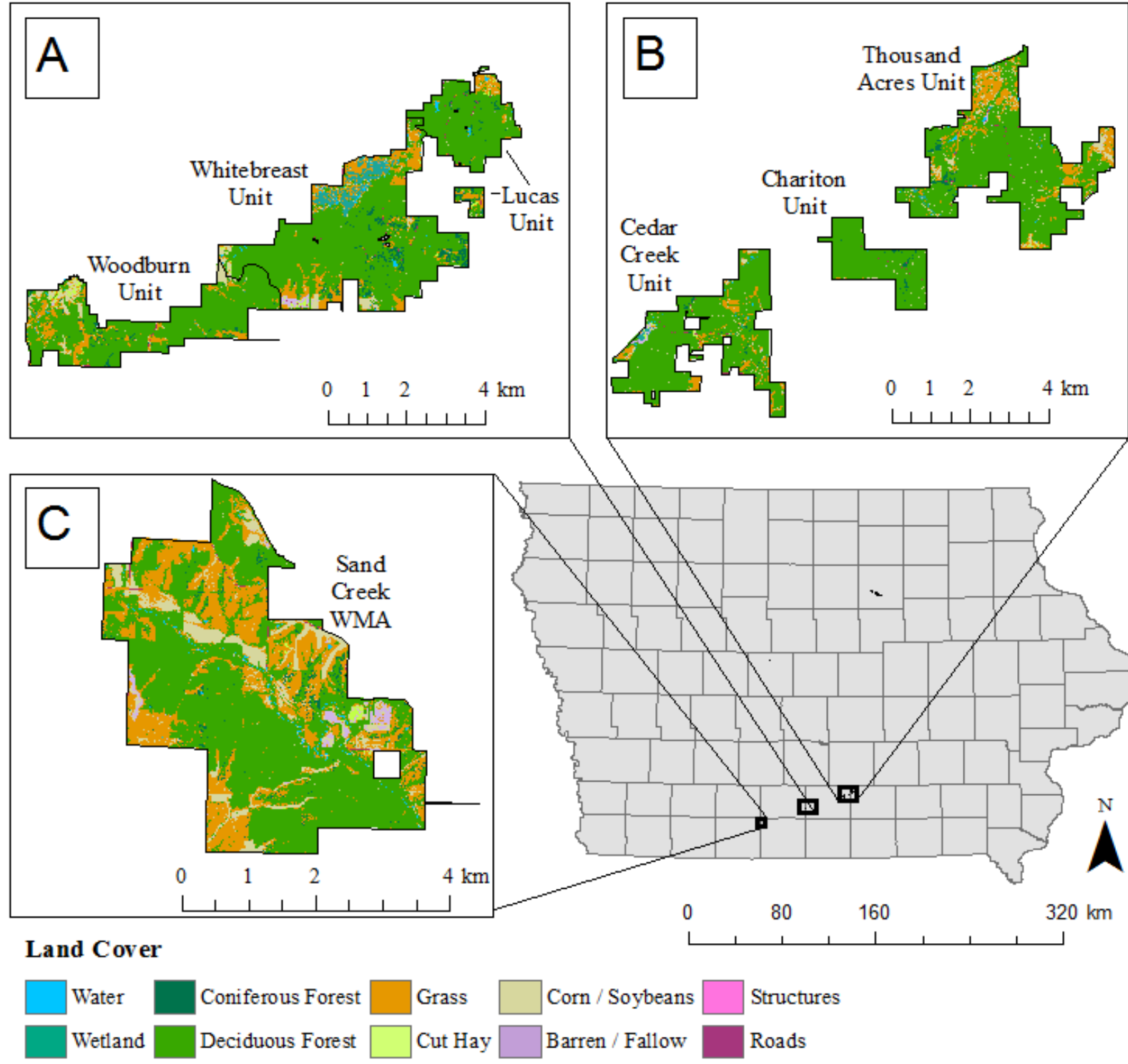


Figure 1. Land cover maps of the study areas and their locations within Iowa. Maps A and B represent the units of Stephen State Forest with the Stephens Forest and Stephens Forest – Thousand Acres Bird Conservation Areas (BCAs), respectively. Map C is of the Sand Creek WMA, located within the Sand Creek Woodland Savanna BCA. Modified from 2009 HRLC.

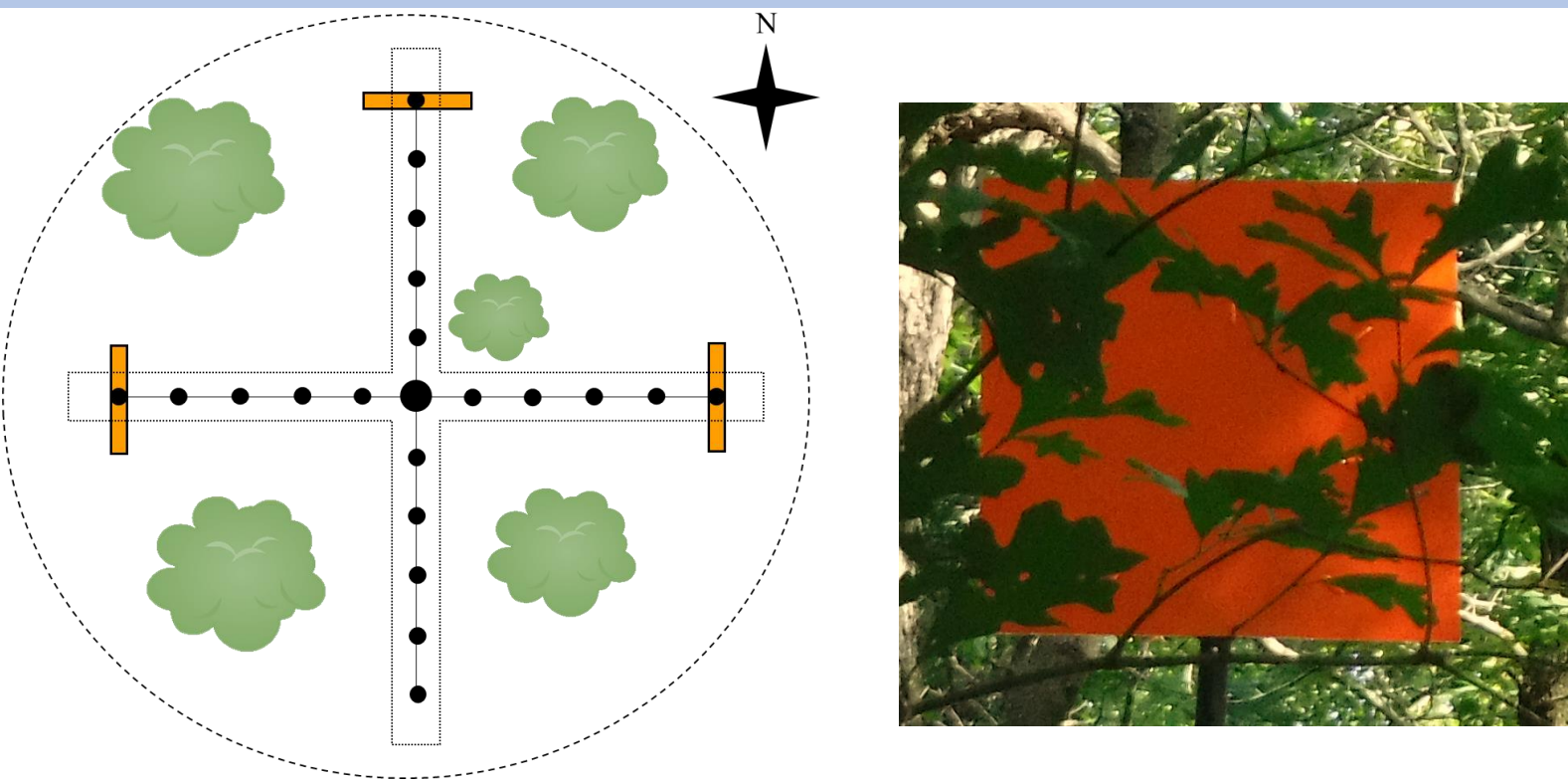


Figure 2. A vegetation survey schematic. The outer circle and trees represent a 1 m forestry prism sample measured from plot center (largest black circle). The cross with a dotted outline represents two 22.6 m x 1.8 m shrub stem count strips. The thin lines intersecting black circles are two 20 m transects along which canopy closure and ground cover were measured as presence/absence using a GRS densitometer. Those transects were centered on the survey point had 10 measurement points each, spaced 2 m apart. The orange rectangles are foliage density board positions, located 10 m from the survey point in three random cardinal directions at heights of 2.5 m and 5.0 m. The photograph is a sample density board photo.

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## Literature Cited

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