# Investigating the influence of vegetation on the habitat choice of various bird species in the Breeding, Mid-Summer, and Autumn seasons

SC/BIOL 3170 Population Ecology York University

Paolo Fortini and Christina Salvatore

#### Abstract

In this study, the influence of vegetation features on the habitat choice of various bird species was investigated. Using multivariate statistics, associations were found between each bird species and various plots for each season of interest. A correlation was found in the Breeding and Mid-Summer seasons (R= 0.744, P=0), suggesting the birds were responding to the vegetation in those plots in a similar way. A correlation was not found between Autumn and either of the Breeding or Mid-Summer season (R= 0.278, P=0.09 and R= 0.18, P=0.184). Preference was classified as either deciduous or coniferous. It was found that there was no overall preference for either plot type in the Breeding and Mid-Summer seasons. The majority of the species preferred deciduous plots in the Autumn. Stronger inferences about preference and about vegetation as a factor affecting habitat choice, would require further investigation.

## Introduction

- Many factors affect habitat choice including vegetation, available territory, and resources
- This investigation aimed to explore the habitat choice of 12 bird species in Parry Sound over three different seasons
- Vegetation was examined as a potential explanatory variable

## **Research Questions**

- 1) Do the songbirds in this community select habitats similarly during Breeding, Mid-Summer, and Autumn?
- 2) Are there particular species that are associated with particular vegetation features?

## Methods

#### Data Acquisition

- Counts of 12 bird species in Parry Sound were obtained for 49 plots of land for the Breeding, Mid-Summer, and Autumn seasons
- Abundances of 25 tree species were determined for these same plots at two elevations; 8m and 14 m

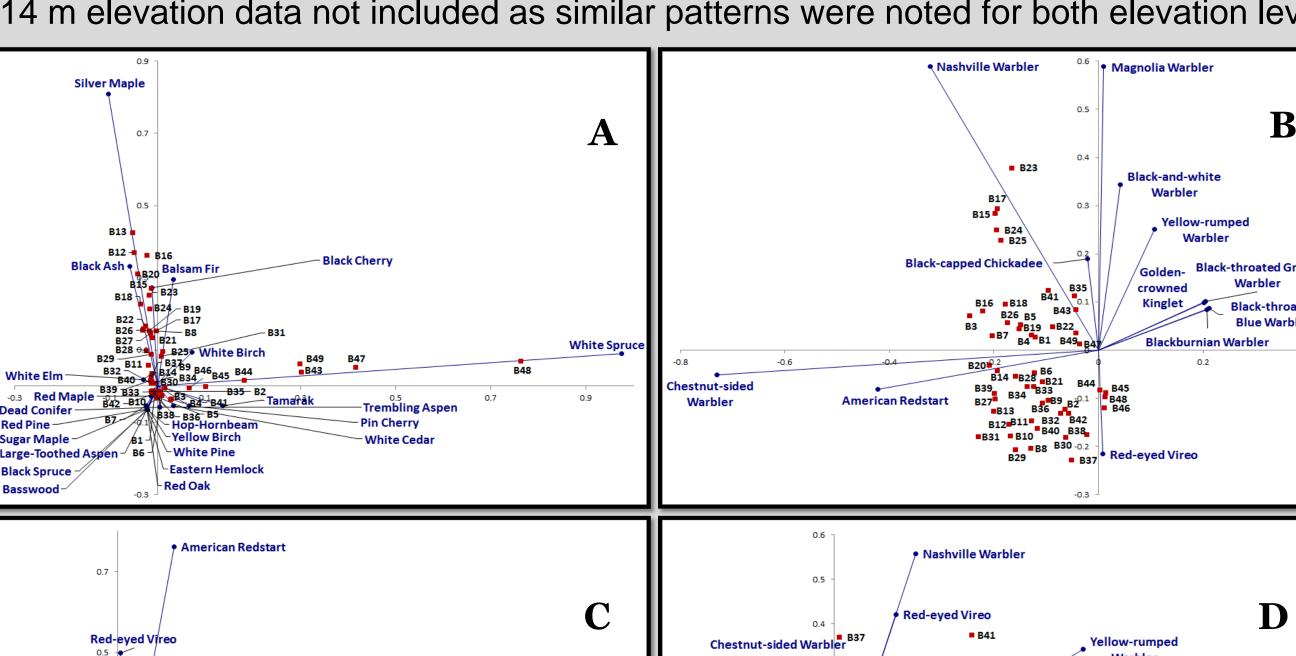
## Methods

#### Data Analysis

- Distance Matrices created to assess relationships between bird species due to their habitat choice in each season
- Mantel Tests conducted to assess the correlations between each season
- Differences in vegetation between the plots was assessed using a Biplot
- Ratio of coniferous to deciduous tree species abundance determined for each plot, and plots assigned as either "coniferous", "deciduous", or "mixed"
- Biplots created for each season to observe association between birds and specific plots to allow for the coupling of a bird species to a potentially preferred forest type

## Results

14 m elevation data not included as similar patterns were noted for both elevation levels



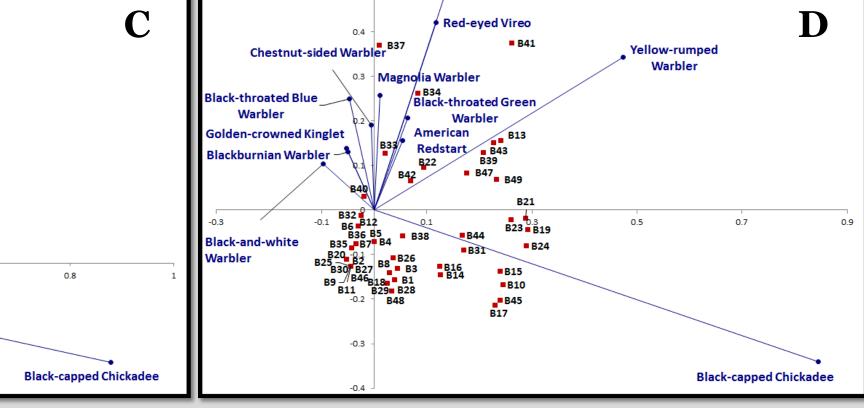


Figure 1: Biplots displaying the association between vegetation and plots (A), as well as between bird species and plots for the Breeding, Mid-Summer, and Autumn seasons (B,C,D respectively).

### Results

Table 1: Plot type choice of the bird species for each season

	Plot Type Choice		
Species	Breeding	Mid-Summer	Autumn
Black-Capped Chickadee	Deciduous	Deciduous	Deciduous
Golden-Crowned Kinglet	Coniferous	Deciduous	Deciduous
Red-Eyed Vireo	Coniferous	Coniferous	Deciduous
Black-and-White Warbler	Deciduous	Deciduous	Deciduous
Nashville Warbler	Deciduous	Deciduous	Coniferous
Magnolia Warbler	Deciduous	Coniferous	Deciduous
Black-Throated Blue Warbler	Coniferous	Coniferous	Deciduous
Yellow-Rumped Warbler	Deciduous	Deciduous	Coniferous
Black-Throated Green Warbler	Coniferous	Coniferous	Deciduous
<b>Chestnut-Sided Warbler</b>	Coniferous	Deciduous	Deciduous
American Redstart	Deciduous	Coniferous	Deciduous
Blackburnian Warbler	Coniferous	Deciduous	Deciduous

#### Mantel Tests

- Breeding and Mid-Summer: R= 0.744, P=0
- Breeding and Autumn: *R*= 0.278, *P*=0.09
- Autumn and Mid-Summer: *R*= 0.18, *P*=0.184

## **Biplots**

- PC Axis 1: heavily influenced by abundance of White Spruce; coniferous tree species (Figure 1A)
- PC Axis 2: heavily influenced by abundance of Silver Maple; deciduous tree species (Figure 1A)

## Discussion

- Habitat choice similar in Breeding and Mid-Summer; birds responding similarly to vegetation in plots
- Difference in habitat choice between Autumn and other seasons suggests response to vegetation differs
- Explanation requires further exploration; perhaps seasonal climate change disrupts the distribution of resources
- No apparent preference for deciduous vs coniferous in Breeding and Mid-Summer
- Majority preferred deciduous in Autumn
- Habitat preference not maintained between seasons except for Black-Capped Chickadee and Black-and-White Warbler