INTRODUCTION

The composition of an animal community depends on a variety of factors, and may be predicted to change on seasonal and successional stage time scales.

Seasonal changes can be extreme in their effects on biological and physical parameters, affecting phenological patterns of plants, and consequently, the faunal abundance.

Although vegetation and the avian community are key components of many biological communities, few studies have examined the changes in bird communities across seasons and stages of ecological succession.

We studied seasonal changes in the abundance, diversity, and similarity of avian communities in abandoned rice fields representing a variety of successional stages on the Cooper River, Berkeley County, South Carolina.

METHODS

Seasons

- Breeding: March - June
- Molt: July - October
- Winter/Migration: November - February

Field Technique

- Photos allowed for confirmation of bird ID
- Field cameras

Census & Data Collecting

- Recorded all species & individuals observed per 5-minute census point

Statistical Analysis

- Shannon Weaver Index (SWI), based on avian abundance & evenness data, was used to examine diversity in every season and stage
- ANOVAs were used to test for significant differences in diversity
- Similar SWI values may mask differences in community composition therefore we calculated similarity indices using a modified Renkonen's index
- Renkonen Similarity Index: 0 = no overlap between samples; 100 = complete similarity

RESULTS

- Successional stage significantly influenced diversity but season did not (Figure 1; F$_{3,306}$ = 141.30, p < 0.001 & F$_{2,207}$ = 0.50, p = 0.61, respectively).
- We observed 5,302 individuals representing 106 avian species (Figures 2 & 3).
- Although similar in species richness, the communities are comprised of completely different species in each season and especially each stage (Figures 2 & 3; Renkonen indices = 36 and 2, respectively).

Abundance of Bird Families by Stage

<table>
<thead>
<tr>
<th>Stage</th>
<th>Abundance</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>322 spp.</td>
<td>Piciformes</td>
</tr>
<tr>
<td>2</td>
<td>672 spp.</td>
<td>Columbiformes</td>
</tr>
<tr>
<td>3</td>
<td>1,223 spp.</td>
<td>Columbiformes</td>
</tr>
<tr>
<td>4</td>
<td>332 spp.</td>
<td>Columbiformes</td>
</tr>
</tbody>
</table>

Abundance of Bird Families by Season

- Breeding: 1,143 individuals, 80 spp.
- Molt: 615 individuals, 64 spp.
- Winter: 489 individuals, 67 spp.

DISCUSSION

- Understanding how the avian community responds to seasonal and successional changes is important for conservation biologists and land managers:
  - Seasonal water drawdowns can manage for peak shorebird migrations
  - Management must be dynamic due to the variety of stages in a given area
  - Similar diversity values may hide large differences in community composition

Rice fields play a vital role in avian diversity and conservation:

- For many species, abandoned rice fields have replaced the original wetland habitats lost to reclamation and development
- Data for current populations of threatened/endoangered species
- Variety of stages provided habitat for multifarious species
- Managing for maximum diversity requires multiple successional stages