Grassland Birds Wintering in Central and Eastern Tennessee

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What is a grassland bird?

- Birds that require open or early successional habitat
- In this case, shrub/scrub species are included
- In eastern North America there are 50 species of grassland or shrub/scrub species (Sauer et al. 2007)

Population Declines of Grassland Birds in E. North America

- Significant population declines
  - 10 of 14 (71.4%) grassland species
  - 18 of 36 (50.0%) shrub/scrub species
- Causes of decline in breeding season, migration, or winter?
- Most research conducted in breeding season


Population Decline of Grassland Birds in E. North America

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Information on this slide based on:

Possible Reasons for Decline

• Habitat loss
  – Conversion to agriculture
  – Succession
• Changing management practices on existing habitat
  – Disturbance regime
    • Type of disturbance
    • Timing of disturbance (time of year and frequency)
• Likely a combination of factors
• Different causes for different species

Winter Grassland Bird Research

Few grassland bird species in winter

Atlantic Coast
Gulf Coast
Peninsular Florida

Research Need:
Mid South

Wintering Grassland Birds in Tennessee

Savannah Sparrow
Population Change (1966-2006)
BBS Estimate: -32.4%
95%CI: -40.0 to -20.9%

Field Sparrow
Population Change (1966-2006)
BBS Estimate: -68.3%
95%CI: -71.9 to -62.0%
Wintering Grassland Birds in Tennessee

Swamp Sparrow
Population Change (1966-2006)
BBS Estimate: 72.0%
95%CI: 26.3 to 124.9%

Song Sparrow
Population Change (1966-2006)
BBS Estimate: -17.8%
95%CI: -24.0 to -14.5%

Research Objectives

- Compare methods for sampling grassland birds
- Determine which species winter in open habitats in central and eastern Tennessee
- Compare the winter bird community among several types of open habitat

Study Area and Methods
Mist Nets at Fort Campbell

- An attempt to determine which species were present on Fort Campbell
- Passive netting with occasional drives to increase capture rate
- Captured 202 individuals, 5 species

Point Counts

- Jan. – Feb. 2006
- Point counts distributed systematically across the southern Big Barrens and Ft. Campbell
- At least 10 minutes spent at each point
- Recorded all birds observed at points and some birds between points

Rope Dragging in Fort Campbell

- 25-50 ft. rope dragged between two observers
- 4 field types
  - Harvested agriculture
  - Unmowed fescue
  - Mowed (<15 cm)
  - Native grassland
- 20 species observed
- 9 species of sparrows
Rope Dragging Method

- **Benefits:**
  - Simple method with low cost and easy calculations
  - Probably causes very close to 100% of individuals to flush

- **Limitations:**
  - Identification can be challenging (rope moving in one hand)
  - Next to impossible with more than a trace of woody vegetation

**Jan. 2006 – Mar. 2007**

- Walked 200 m transects
- 3 field types
  - Native grassland
  - Burned fields
  - Agricultural
- 19 species observed
  - 5 species of sparrows
Mist Net Captures by Species

- Song Sparrow, 122
- Swamp Sparrow, 50
- White-crowned Sparrow, 4
- Common Yellowthroat, 1
- Savannah Sparrow, 25

Our hopes of getting a good idea of the species richness in Ft. Campbell were not realized (fewest species of any of the 4 methods).

Point Counts

- Not a well standardized method
- Recorded several species not observed in the other three methods
  - American Kestrel
  - Brown Thrasher
  - Fox Sparrow
  - European Starling
  - Loggerhead Shrike
  - Merlin
  - Red-winged Blackbird
  - Rusty Blackbird

Rope Dragging: Species Observed

**Sparrows**
- Field Sparrow
- Vesper Sparrow
- Savannah Sparrow
- Song Sparrow
- Lincoln’s Sparrow
- Swamp Sparrow
- White-crowned Sparrow
- White-throated Sparrow
- Dark-eyed Junco

**Other Species**
- Northern Harrier
- Northern Bobwhite
- Mourning Dove
- Short-eared Owl
- Horned Lark
- American Pipit
- Cedar Waxwing
- American Robin
- American Crow
- American Goldfinch
- Eastern Meadowlark

*Partners in Flight Watch List Species*
Results of Ft. Campbell Rope Dragging

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<th>Type</th>
<th>Fields</th>
<th>Area (ha.)</th>
<th>No. Species</th>
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<td>3</td>
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<td>10</td>
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<td>6</td>
<td>21.2</td>
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<tr>
<td>Harvested Ag</td>
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<td>5</td>
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ANOVA: F = 4.97, df = 3, p = 0.01

Transect Results

- Sampled 19 transects three times each
  - 19 agriculture
  - 14 burned
  - 22 native grassland
- 70.5% (299/424) of all individuals observed were of 4 species (19 species total)
  - 25.7% Swamp Sparrow
  - 16.7% Song Sparrow
  - 14.2% Savannah Sparrow
  - 13.9% Field Sparrow
Transect Results by Field Type and Species

- **Savannah Sparrow**
  - Average: 2.58 ± 2.56 Birds / Transect
  - Location: Yuchi WMA

- **Field Sparrow**
  - Average: 2.43 ± 2.78 Birds / Transect
  - Location: Seven Islands Wildlife Refuge

Agricultural Fields

- Savannah Sparrow
- Yuchi WMA

Burned Fields

- Field Sparrow
- Seven Islands Wildlife Refuge
Discussion of Methods

- Mist nets were not sufficient to predict what species were present.
- Predatory species such as American Kestrel, Merlin, Short-eared Owl, and Loggerhead Shrike were only detected with a region-wide network of point counts.
- No single method seems to give a complete picture of the system.
- Methods are not readily comparable.

Discussion of Results

- Density of grassland birds differed among different types of open habitat (based on rope dragging).
- Song and Swamp Sparrows were more abundant in native grass fields than on burned or agricultural fields.
Management Implications

• Several types of open habitats might be necessary to support all open habitat birds that winter in the Mid South.
• Management strategies suited to other regions might not be ideal for the Mid South.

Management Implications

• Consider cover and food
• Both thermal cover and predation cover
• Timing of burning
  – Within year
  – Between years
• Does burning increase food availability?

Research Implications

• Variable system
• Research design should be well thought out
• Multiple scales necessary to include both songbirds and less common species
• Dynamic nature of grassland systems makes an experimental design attractive