Using first-passage time analysis to identify foraging patterns of the Northern Bobwhite

Project collaborators:

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Why study foraging behavior?

- Type of habitat selection
- Influences to covey detection
- Predators influence foraging behavior by distributing risk
Foraging as a search behavior

- Area restricted search (ARS)
  - High time: area ratios
  - Short step lengths
  - High turning angles

- Characteristic of-
  - Foraging
  - Nesting/nest building
The Study System
Collecting foraging data

• Trapping and radio-tagging of individual coveys \( (n = 143 \text{ and } n = 148) \), respectively
• Systematic sampling of tagged coveys
• October 2013 – March 2014: 1 hr. successive locations
• October 2014 – March 2015: 30 min successive locations
Data Analysis

- First passage time analysis (Fauchauld and Tverra 2003)
FPT Analysis: Threshold and Zones

- Threshold determination and zone designation (Lefebvre et al. 2012)
Variables of interest

<table>
<thead>
<tr>
<th>Bout level</th>
<th>Daily level</th>
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<tbody>
<tr>
<td>Duration</td>
<td>Total duration</td>
</tr>
<tr>
<td>Area</td>
<td>Total area</td>
</tr>
<tr>
<td>Bout timing</td>
<td>Bout frequency</td>
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</tbody>
</table>
Results: Daily Movement

- 514 daily movement paths
  - 122 individuals
  - 30 unique coveys
- 21 relocations per path (mean, SD=2)
- Average path length 464 m (SD=152)
Results: Foraging Behavior

Starting time of foraging bouts for the Northern Bobwhite

Length of foraging bouts for the Northern Bobwhite
Results: Foraging Behavior

Bout frequency of daily movement paths:
- 56% of bouts are short
- 41% of bouts are medium
- 3% of bouts are long

Size of foraging bouts for the Northern Bobwhite:
- Frequency distribution across different area sizes (ac)
Results: Foraging Behavior

- Peak Hunting
- One Bout
- Two Bouts
- Three Bouts
Results: Foraging Behavior
Summary

• Two foraging strategies
• Foraging duration and area were about what was expected
• Timing was later than expected
• Hunting pressure influenced foraging behavior
What’s next?

• Advent of GPS units small enough for bobwhite
• Directly relating consequences of movement (i.e. foraging) to survival or other population dynamics
• Using real time fine-scale movement data to identify areas of interest such as nests or roost sites
• Impact of supplemental feed
Acknowledgements

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Questions?