Estimating Deer Populations Using Trail Cameras

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Acknowledgements

• Ron Anderson
• Jeff Beringer
• Amy Davis
• Alex Foster
• Lonnie Hansen
• Jason Sumners
• Ivan Vining
Reason for the Study

• Estimating population size is an important part of deer management

• Traditional methods of population estimation include
  – Track counts
  – Pellet counts
  – Helicopter surveys
An Alternative to Helicopter Surveys:
Mark/Recapture using trail camera photographs

2006 - Pilot study

2007 - Population estimates on three conservation areas

2009 - Population estimate using marked deer in an enclosure

2011 - Population estimate at Big Springs NPS site in Ozark National Scenic Riverways
Methods

• 1 camera per 160 acres
• Camera sites pre-baited with corn for 10 days prior to camera placement
• Cameras recorded images for 10 days
• Photographs were reviewed and ‘capture’ data was entered in a database
• Data analysis
  – population estimation using MARK
  – Jacobson formula
Population Estimate Using Jacobson Method

Enter Deer Id Prefix: BS
(2-digit Area Prefix from tblArea)

- Unique Bucks: 88
- Total Buck Photos: 7003
- Total Doe Photos: 7877
- Total Fawn Photos: 2733
- Total Antlerless Photos: 194
- Total Undetermined Photos: 1938

Calculating...

Bucks: 97.68
Does: 109.9
Fawns: 38.12
Antlerless: 2.706
Undetermined: 27.03
Total Estimate: 275.4093
Photo Review 2007

- 42,412 photos were taken
- Deer were captured in 38,440 photos
- Bucks were present in 12,538 photos
- 171 individual bucks were identified
Photo Organization

• Separate folders for each camera/location

• Preliminary steps:
  – change file names from those assigned by the cameras to something more meaningful
  – import file names to MS Access table
  – create a hyperlink field
Information Needed

- Unique ID for each deer that could be identified
- Dates and locations each identifiable deer was ‘captured’
- Total number of:
  - does
  - fawns
  - antlerless deer
  - deer ‘present but otherwise undetermined’
42,412 photos!
**Photo Information**

**Reviewer:**

**Area Name:**

**Photo Id:**

**Review Date:** (mm/dd/yyyy)

**Folder:**

**Click to see Photo**

**PhotoId:** 2006T1AT1_001.jpg

**Weather Conditions:**

**Photo Quality:**

- Deer Present
- Other Animals Present

**Day or Night:**

- Day
- Night

Enter the number of each type of deer identified in the photo:

- Buck: 0
- Doe: 0
- Fawn: 0
- Antlerless: 0
- Cannot be Determined: 0

**List Other Animals:**

**Comments about the photo:**

**Go To Deer Records**

**Go To Capture Records**

**Close**
### Capture Information

**Antler Pts Left**: 4
**Antler Pts Right**: 4

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**Capture Date**: 

**Comments**: 

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[See Deer List]
### Capture Information

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### Update Reference Photo

- **Select the new photo:**
  - **Area Name:**
  - **Folder:**

- **Photo Id:**

- **Select the Deer Id:**

  - **DeerId**

  - **Update Photo Information**
  - **Close**
### Capture Information

<table>
<thead>
<tr>
<th>Field</th>
<th>Input</th>
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</thead>
<tbody>
<tr>
<td>Antler Pts Left</td>
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</tr>
<tr>
<td>Antler Pts Right</td>
<td></td>
</tr>
<tr>
<td>Feature</td>
<td></td>
</tr>
</tbody>
</table>

- **See Deer List**
- **Capture Details**
- **Add New Deer To List**

**Click to see Photo**

- **PhotoId:**
- **DeerId:**
- **CaptureDate:**
- **Comments:**
Issues

• Battery life/storage capacity
• Theft of cameras
• Photo quality
• Length of review
  – 545 hours for the 2007 study ($4632)
  – comparative cost of helicopter surveys: $6000 + time and labor cost of pilot and biologists
Summary

• Using trail cameras to estimate antlered buck populations appears to be a viable option

• Compared to helicopter surveys, camera surveys are less costly but are more labor intensive

• August camera counts are more likely to reflect fall populations

• Training and skill of photo reviewers is critical

• Photographs are useful for public relations
Questions?