Deer Population Survey Methods: Which One is Right for You?

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Who are we?
A. Landowner
B. Land manager
C. Educator
D. Natural resource agency personnel
E. Non-governmental conservation organization rep.
F. Hunter

Survey vs. Census

- **Survey** is a sample of a population
- **Census** is an enumeration of absolutely everyone in the population

Which is more likely in deer management?

Why census deer?

- Inventory
- Marketing
- Determine harvest guidelines
- Plan livestock grazing
  - Stocking rate
  - Movements
- Plan habitat modifications

Accuracy vs. Precision

Which is accurate? A, B, or both?
Which is precise? A, B, or both?

A  B
Accuracy and Precision

Accuracy vs. Precision
Trend can be established
Enhanced with repetition

To Enhance Precision

Objectivity?
Consistent method
- Same observers when possible
- Consistent weather conditions
- Same time
- Same season

Subjectivity?
Fluid method
- Change observers as needed to garner most observations
- Compete with former counts using whatever improved means are currently available
- Only count deer where known high densities occur
- Set up lines only in the best deer habitat

Most Common Deer Survey Methods

A. Spotlight
B. Incidental
C. Aerial
D. Camera

Most Common Deer Survey Methods

- Spotlight
- Incidental
- Aerial
- Camera

Optimal timing - Fall, before deer season
**Spotlight**
- 2 observers (plus driver, ideally)
- High candlepower spotlights
- Laser range finder
- Binoculars
- Drive slow (~5-7 mph)
- Don’t count across deep topography
- 250 yd. sighting limit

1. Length of road
2. Average visibility (width) at 1/10 mile intervals
3. Length X Width = Acres observed

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**Data collection**

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**Spotlight Survey spreadsheet**

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**Deer Density & Herd Composition Workbook**

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### Preliminary Data

<table>
<thead>
<tr>
<th>Percent Sighting</th>
<th>Centerline Sightings</th>
<th>Project Name</th>
<th>Project Name</th>
<th>Est.</th>
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### Spotlight Field Sheet

<table>
<thead>
<tr>
<th>Site 1</th>
<th>Site 2</th>
<th>Site 3</th>
<th>Site 4</th>
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### Deer Population Estimates & Ratios

<table>
<thead>
<tr>
<th>Ranch Name</th>
<th>Triangle</th>
<th>Pasture Name</th>
<th>Gillespie</th>
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<tr>
<td>Ranch Size</td>
<td>10,000.00</td>
<td>Days</td>
<td>5.00</td>
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<tr>
<td>Total Yards Observed</td>
<td>10,014.00</td>
<td>Estimates/Total Deer</td>
<td>1,816.77</td>
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<tr>
<td>Estimated Yards Observed</td>
<td>264.29</td>
<td>Est. of Bucks</td>
<td>948.39</td>
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<tr>
<td>Total Deer identified</td>
<td>29</td>
<td>Est. of Does</td>
<td>713.73</td>
</tr>
<tr>
<td>Percentage Bucks Obs.</td>
<td>50.0%</td>
<td>Est. of Fawns</td>
<td>194.05</td>
</tr>
<tr>
<td>Percentage Does Obs.</td>
<td>39.3%</td>
<td></td>
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</tr>
<tr>
<td>Percentage Fawns Obs.</td>
<td>10.7%</td>
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</tbody>
</table>

### Incidental
- Data collected as regular work is done
- Record all sightings
- Provides
  - Buck: doe ratio
  - Fawn survival
  - Antler quality
  - Body condition
- Will not provide density measurement
Incidental
- Google Earth (free software) and GPS unit

What parameter does an Incidental survey not provide?
A. Buck:doe ratio
B. Acres/deer
C. Fawn survival
D. Antler quality

Questions?

Aerial survey - helicopter
- Two observers (one for each side)
- ~100 feet altitude, ~20 to 40 mph
- Observe 330 feet each side of centerline of pass
- Move over ¼ mile for next pass
- GPS fixes on sightings, record of route

50% coverage (50% sample)
Aerial survey

Cost per hour: $300 to $550 plus
Under-counts common (40-70% accuracy)
Repeat if possible

Aerial surveys

- Relatively expensive
- Takes less time
- Accuracy
  - Past research examples
    - 40-70% whitetails seen
    - 17-65% whitetails seen
  - Current study, Zabransky, TAMU-K
    - 47% mule deer seen
    - 24-80% whitetails seen
    - Sex ratio reliable
  - Suitable for most habitat other than closed canopy
  - Settle on a correction factor of maybe 2?
    - i.e. assume ½ of actual population seen?

Questions?

Camera Census

- Infrared-triggered
  game/trail cameras
- In addition to census, can provide information for
  - Marketing
  - Antler quality assessment
  - Distribution of deer
    - Habitat utilization
    - Huntability

Deer census using cameras

- Strategy
  - Attempt to photograph all antlered bucks
  - Photograph as many deer as possible
  - Total coverage of ranch
    - Watering points
    - Feeders
    - Temporary feed piles (check with your state reg)

- Further Strategy and Placement
  - One camera per ¼ section (160 ac.)
  - After antler growth completed
  - Move systematically across ranch (use grid?)
  - Attempt to complete as quickly as possible
    - 3-4 days per site minimum (5-10 better)
    - 10 min. image delay

- Analysis
  - Analyze images for total number of bucks, does, and fawns including known repetitions; do not include unidentifiable deer
  - Identify total unique/individual bucks (by antlers)

Modified from:
Camera census results and calculations

<table>
<thead>
<tr>
<th>Total images</th>
<th>Bucks</th>
<th>Does</th>
<th>Yearlings</th>
<th>Fawns</th>
<th>Total</th>
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<tbody>
<tr>
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<td>90</td>
<td>120</td>
<td>30</td>
<td>90</td>
<td>330</td>
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<tr>
<td>Percent of population</td>
<td>27</td>
<td>36</td>
<td>9</td>
<td>28</td>
<td>100</td>
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<tr>
<td>Total individual bucks</td>
<td>15</td>
<td>17</td>
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<tr>
<td>Percent of total bucks seen</td>
<td></td>
<td></td>
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<tr>
<td>Actual number of deer</td>
<td>15</td>
<td>20</td>
<td>5</td>
<td>15</td>
<td>55</td>
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</table>

Camera census - other considerations

- Bucks may be over-counted because of feeder dominance
- Familiarity with bait essential
- Attractiveness of feed lessened by heavy mast (acorns, etc.) crop
- Intensive camera survey can “capture” over 80% of older bucks, which are more likely to be active after dark

Comparison of infrared-triggered camera deer surveys and spotlight deer surveys

<table>
<thead>
<tr>
<th>Year</th>
<th>Acres/Deer</th>
<th>Total Deer</th>
<th>Buck:Does Ratio</th>
<th>Net Fawn Crop (Fawns/Does)</th>
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<tbody>
<tr>
<td>Year 1</td>
<td>18</td>
<td>161</td>
<td>1:1.8</td>
<td>0.57</td>
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<td>27</td>
<td>107</td>
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<td>Year 2</td>
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<td>242</td>
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<td>39</td>
<td>74</td>
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<td>Year 3</td>
<td>15</td>
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<td>22</td>
<td>129</td>
<td>1:1.8</td>
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Spotlight survey
IR-triggered camera survey

Summary Comments

- Choose a method that matches your habitat/brush density, topography
- Choose a method that fits your manpower resources and pocketbook
- Realize accuracy limitations of all methods, but strive for precision and objectivity so that you can assume reliable trend information
- Use same method(s) every year
- Observe browse plant condition, body condition, and antler quality to help gauge appropriate deer density

Questions?

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