Across state lines: A comparison of deer-related impacts perceived in Illinois and Michigan, USA

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Enabling Impact-based Management of Deer

From: Jenkins and Bartlett. 1959. “Michigan Whitetails.”
Measures of Capacity for Wildlife Populations

- Biological Carrying Capacity
- Acceptance Capacity
Impacts are a subset of effects, arising from recognized events or interactions pertaining to wildlife, and evaluated by stakeholders as sufficiently important to warrant management attention.

Modeling Acceptance Capacity for Deer in Southern Michigan

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>n</th>
<th>p-value</th>
<th>Adjusted $r^2$</th>
<th>AIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPACT (total)</td>
<td>1392</td>
<td>0.000</td>
<td>0.070</td>
<td>4001.3</td>
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<tr>
<td>IMPACT_EFFECT(total)</td>
<td>1392</td>
<td>0.000</td>
<td>0.317</td>
<td>3571.6</td>
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<tr>
<td>READ_WL + PHOTO_WL + OBSERVE_WL + GARDEN + FEED_WL + FEED_DEER + DVC + HUNT + FARM + RESIDENCE_CHILD + RESIDENCE_CURRENT + YEARS_CURRENT + GENDER + AGE + EDUCATION+ IMPACT_EFFECT(total)</td>
<td>1392</td>
<td>0.000</td>
<td>0.362</td>
<td>3573.8</td>
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Objectives

• To compare deer-related impacts perceived by residents of 2 states to determine the effect of regulatory frameworks, and social and cultural landscapes

• To determine which deer-related impacts have the greatest effect on acceptance capacity for deer
Study Areas

West Central Illinois

Southern Michigan
Methods

• Mail-back questionnaire
  – Delivered to 4,258 residents of WC Illinois and 2,172 residents of S Michigan from April – July 2009
  – Randomly selected names and addresses
  – Telephone non-response survey in MI, mail in IL

• Subject areas:
  – Wildlife-related activities and land use
  – Frequency and importance of interactions with deer
  – Acceptance Capacity
  – Opinions of IL and MI DNR deer management activities
  – Demographics
Survey Response

• IL: 41% adjusted response rate (1,723 valid responses)

• MI: 39% adjusted response rate (854 valid responses)

• No apparent differences between respondents to full survey and non-respondent survey
## Wildlife-related Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>MI</th>
<th>IL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deer hunting</td>
<td>22%</td>
<td>30%</td>
</tr>
<tr>
<td>Farming</td>
<td>13%</td>
<td>32%</td>
</tr>
<tr>
<td>Gardening</td>
<td>79%</td>
<td>76%</td>
</tr>
<tr>
<td>DVC in last 3 years</td>
<td>18%</td>
<td>48%</td>
</tr>
</tbody>
</table>
Impacts Perceived

**Michigan**
1. Feeling connected to nature when deer are seen around home = 56%
2. Feeling connected to nature when deer are seen in forested areas = 53%
3. Feeling connected to nature when deer are seen in farm fields = 52%
4. Worrying about my risk of injury from a DVC when deer are seen along the road = 43%
5. Worrying about my risk of injury from a DVC when deer are seen around home = 41%

**Illinois**
1. Worrying about my risk of injury from a DVC when deer are seen along roads = 53%
2. Worrying about my risk of injury from a DVC when deer are seen around home= 51%
3. Worrying about my risk of injury from a DVC when deer are seen in farm fields= 50%
4. Worrying about the hassle of a DVC when deer are seen along the road = 49%
5. Worrying about the cost of a DVC when deer are seen around home = 48%
Modeling Acceptance Capacity

• Acceptance Capacity = desired change in the deer population in the next 5 years
  – Measured on 5-point scale from decrease greatly (1) to increase greatly (5)

• Impact Effect = Impact perceived x valence of impact x degree of change desired
  – For each impact (n=33)
  – Summed over all impacts

• Developed *a priori* models and compared using multiple linear regression, model selection with AIC

• Only includes IL respondents
Reducing Covariation Among Impacts

I feel connected to nature when I…
• see deer around my home
• see deer along the roadway
• see deer in farmer’s fields
• see deer in forested areas

I worry about the cost or hassle of dealing with a DVC or my risk of injury from a DVC when I…
• see deer around my home
• see deer along the roadway
• see deer in farmer’s fields
• see deer in forested areas

I feel confident deer hunting will be good when I…
• see deer around my home
• see deer in farmer’s fields
• see deer in forested areas

I feel confident deer are healthy and well fed when I…
• see deer in farmer’s fields
• see deer in forested areas
<table>
<thead>
<tr>
<th>Model Name</th>
<th>$n$</th>
<th>Adjusted $r^2$</th>
<th>$AIC_c$</th>
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</thead>
<tbody>
<tr>
<td>All Impacts</td>
<td>344</td>
<td>0.479</td>
<td>-135.0</td>
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<tr>
<td>Demographic</td>
<td>344</td>
<td>0.478</td>
<td>-99.9</td>
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<tr>
<td>Aesthetic</td>
<td>344</td>
<td>0.374</td>
<td>-99.8</td>
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<tr>
<td>Economic</td>
<td>344</td>
<td>0.281</td>
<td>-52.4</td>
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<tr>
<td>DVC</td>
<td>344</td>
<td>0.257</td>
<td>-45.0</td>
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<tr>
<td>Deer Population</td>
<td>344</td>
<td>0.240</td>
<td>-31.4</td>
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<tr>
<td>Human Health and Safety</td>
<td>344</td>
<td>0.233</td>
<td>-30.2</td>
</tr>
<tr>
<td>Hunter</td>
<td>344</td>
<td>0.152</td>
<td>4.7</td>
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<tr>
<td>Effects of Hunting</td>
<td>344</td>
<td>0.104</td>
<td>25.5</td>
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</tbody>
</table>
Summary and Management Implications

• Effects of interactions (impacts) with wildlife are most meaningful to stakeholders, independent of setting

• Effect of impacts more important than stakeholder characteristics in predicting acceptance capacity for deer

• DVCs have greatest effect on acceptance capacity for deer in IL

• Frequency of DVCs elevates the importance of DVC-related impacts
Thank you!

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