In Search of Solitude: A Case study of Wilderness and Non-Wilderness River Users on a National River

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Overview

• Wilderness and its users
• Normative Theory & Hypothesis
• Research Site & Survey
• Results
• Discussion & Questions Raised
• Managerial Impacts & Conclusions
Wilderness

- Wilderness is an area where:
  1. generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;
  2. has outstanding opportunities for solitude or a primitive and unconfined type of recreation...

  - Wilderness Act, 1964

- Federally mandated to be managed according to these ideals
- Do visitors seek out these wilderness ideals?
Wilderness Users

We can expect wilderness and its visitors to differ from non-wilderness users:

- Often different usage rates
- Different preferences
- Intentionality of visit
- Separated VUM policies
- Develop plans responsive to visitor preferences for conditions, among other factors

Normative Theory

- Norms are shared beliefs within a population
- Used to find visitor’s desired conditions
- Indicators and thresholds
- Can be assumed that wilderness users have lower thresholds (Shelby, 1981)
- Standards are generally unrelated to current conditions (Laven and Krymkowski, 2005)
Hypotheses

H1: Wilderness users will have lower thresholds and less tolerance for higher use conditions (Boats at one time (BAOT) and river encounters)

H2: Wilderness users will report experiencing fewer BAOT and river encounters per hour

H3: Wilderness users will report experiencing less crowding

H4: Experienced conditions will not influence reported norms
Research Site

• National River in the South East U.S.
• Multiple recreational opportunities to float:
  - Canoe
  - Kayak
  - Tube
• 2 sections of the river:
  - Wilderness
  - Non-wilderness
• Highly unlikely that day-users would have experienced both conditions (~95 river mi. separating survey points)
Methods

• Visitor surveys:
  – August 2016 – Summer 2017
  – Stratified random probability sampling upon river exit
  – Visual, Qualtrics-based survey administered via tablet computer
    (Stanky, 1980; Brownlee, Sharp, Peterson, and Cribbs, 2018)

• Crowding operationalized
  – Photographs on a range of realistic conditions – solitude to saturation
    • # boats (BAOT) 0-24, inc. of 6
    • # encounters with other people per hour (encounters) 0-100, inc. of 20
    • Likert 9-point scale of acceptability: -4 (very unacceptable) to +4 (very acceptable)
  – Crowding based on today’s experience
    • Likert 9-point scale of crowding: 1 (not at all crowded) to 9 (extremely crowded)

• Analysis in SPSS v24, means and t-tests
• Consensus/crystallization (PCI2) of well-defined norms (Vaske and Shelby, 2008)
Visuals

Photo 1: 0 boats
Photo 2: 6 boats
Photo 3: 12 boats
Photo 4: 18 boats
Photo 5: 24 boats
Results

• n = 344
  - 190 Wilderness
  - 154 non-wilderness
• 77% Response Rate
• 2.73% confidence interval at the 95% confidence level

Demographics for each user group was generally the same:
• Average age: 40 years
• 53% male, 47% female
• 17% some college, 32% 4 yr degree, 23% grad/professional degree
• 87% white, 5% Hispanic or Latino/Latina
• Most home zip codes within 3-4 hours
• 61% annual visitors
## Acceptability: BAOT

<table>
<thead>
<tr>
<th>Location</th>
<th>Photo 1: 0 boats</th>
<th>Photo 2: 6 boats</th>
<th>Photo 3: 12 boats</th>
<th>Photo 4: 18 boats</th>
<th>Photo 5: 24 boats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilderness</td>
<td>2.83</td>
<td>1.66</td>
<td>0.26</td>
<td>-1.44</td>
<td>-2.29</td>
</tr>
<tr>
<td>Non-Wilderness</td>
<td>2.83</td>
<td>1.57</td>
<td>0.43</td>
<td>-1.11</td>
<td>-2.03</td>
</tr>
<tr>
<td>t-value</td>
<td>0.225</td>
<td>0.709</td>
<td>0.419</td>
<td>0.297</td>
<td>0.734</td>
</tr>
<tr>
<td>p-value</td>
<td>0.822</td>
<td>0.484</td>
<td>0.677</td>
<td>0.767</td>
<td>0.463</td>
</tr>
</tbody>
</table>

### Graphs

**BAOT in Wilderness**
- 1: 2.83
- 2: 1.66
- 3: 0.26
- 4: -1.44
- 5: -2.29

**BAOT in Non-Wilderness**
- 1: 2.83
- 2: 1.57
- 3: 0.43
- 4: -1.11
- 5: -2.03
Acceptability: Encounters/Hour

<table>
<thead>
<tr>
<th>Location</th>
<th>0 people</th>
<th>20 people</th>
<th>40 people</th>
<th>60 people</th>
<th>80 people</th>
<th>100 people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilderness</td>
<td>2.75</td>
<td>1.38</td>
<td>-0.13</td>
<td>-1.59</td>
<td>-2.28</td>
<td>-2.89</td>
</tr>
<tr>
<td>Non-Wilderness</td>
<td>2.66</td>
<td>1.36</td>
<td>-0.17</td>
<td>-1.33</td>
<td>-2.21</td>
<td>-2.64</td>
</tr>
<tr>
<td>t-value</td>
<td>0.438</td>
<td>0.373</td>
<td>0.902</td>
<td>1.973</td>
<td>1.652</td>
<td>1.324</td>
</tr>
<tr>
<td>p-value</td>
<td>0.661</td>
<td>0.709</td>
<td>0.368</td>
<td>0.049*</td>
<td>0.099</td>
<td>0.186</td>
</tr>
</tbody>
</table>
# Management Thresholds

<table>
<thead>
<tr>
<th># of Boats/People</th>
<th>BAOT</th>
<th>Encounters/Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Today’s experience</td>
<td>Mgmt action required</td>
</tr>
<tr>
<td>Wilderness</td>
<td>8.05</td>
<td>19.06</td>
</tr>
<tr>
<td>Non-wilderness</td>
<td>3.74</td>
<td>17.54</td>
</tr>
<tr>
<td>t-value</td>
<td>4.258</td>
<td>1.409</td>
</tr>
<tr>
<td>p-value</td>
<td>&gt;0.01*</td>
<td>0.159</td>
</tr>
</tbody>
</table>
Crowding

<table>
<thead>
<tr>
<th>%</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilderness</td>
<td>6.5</td>
<td>5.4</td>
<td>8.2</td>
<td>15.2</td>
<td>26.1</td>
<td>10.3</td>
<td>16.3</td>
<td>5.4</td>
<td>6.5</td>
<td>5.11</td>
<td>2.076</td>
</tr>
<tr>
<td>Non-wilderness</td>
<td>35.4</td>
<td>20.8</td>
<td>17.4</td>
<td>9.0</td>
<td>11.1</td>
<td>0.7</td>
<td>4.9</td>
<td>0.7</td>
<td>0.0</td>
<td>2.65</td>
<td>1.752</td>
</tr>
</tbody>
</table>

Level of crowding you experienced at Buffalo National River today

Level of Crowding
1 = Not crowded; 9 = Extremely Crowded

Wilderness □ Non_Wilderness
Is Solitude a Priority?

- Wilderness users reported experiencing **double** the amount of “traffic” than non-wilderness users (BAOT and encounter rate)
- Thresholds for each user group were **not** violated
- ”Use should never be limited”, 57% were wilderness users.
Discussion

H1: Wilderness users will have lower thresholds and less tolerance for higher use conditions (BAOT and river encounters)

H2: Wilderness users will report experiencing fewer BAOT and river encounters per hour

H3: Wilderness users will report experiencing less crowding

H4: Experienced conditions will not influence reported norms

Refuted

Supported
Questions raised

1. Do visitors recognize that portions of the river are wilderness and non-wilderness?
2. Do visitors understand the difference between wilderness and non-wilderness?
3. Do visitors care about the values that wilderness should possess and should be managed for?
4. What does this mean for wilderness management?
Is crowding in wilderness overlooked?

• Overall increase in visitation to parks and protected areas (Manning, 2013)

• Visitor displacement and possible shift to wilderness

• Limited research

• Dose management have a response?
Management

- Clash of mandates
  - Opportunity for recreation VS. “Outstanding opportunities for solitude”
- Management is managing for visitor experience rather than wilderness integrity
- Does management need to take action to maintain Wilderness Act values even if these values are not being sought after by the public?
Conclusions

• Is this happening in other wilderness areas?
  - More research should be done

• What are the ecological effects?
  - Environmental impact studies comparing wilderness and non-wilderness

• If Wilderness Act ideals are to be reestablished, widespread changes must be done.
Thank you

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