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- Theme “Toward Resilient Recreational Fisheries”
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Assessment of context-specific angler motivations reveals the importance of catch motives as well as the existence of distinct motivational angler types, with implications for management

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The study of angler motivations

• Rationale:
  Benefits-based management necessitates to understand what is important to anglers (Driver 1985)

• Typically assessed using item lists and the question “How important are each of the following reasons to go fishing for you?” (5-point importance scale)

• Two types of motives (e.g., Fisher 1997)
  – Activity-general (Non-catch)
  – Activity-specific (Catch)
Catching fish ($\alpha = 0.75$)
- To catch fish for eating
- For the experience of the catch
- To catch a "record" or "trophy" fish
- For the fun of catching fish
- For the challenge or sport of fishing

Relaxation ($\alpha = 0.82$)
- To get away from the regular routine
- For relaxation
- To experience solitude or tranquility
- To get away from the demands of other people
- To get away from crowds of people

Excitement ($\alpha = 0.74$)
- To experience new and different things
- To experience adventure and excitement
- To have thrills

Socializing ($\alpha = 0.78$)
- To do something with your family
- To bring your family closer together
- To be with friends
- To be with others who enjoy the same things you do

Experiencing nature ($\alpha = 0.82$)
- To be outdoors
- To be close to the water
- To experience unpolluted natural surroundings
- To learn more about nature
- To be close to nature

Sutton (2007)
Non-catch motives have consistently been found to be more important than catch motives at the aggregated angler population level. …

...for fishing as a *generic activity*
Angler motives and management

• A question of management relevance…

• Motivations poor predictors of angler behavioral patterns
  – harvesting decisions (Hunt et al. 2002)
  – fishing site choice (Schramm et al. 2003)
  – management preferences (Arlinghaus & Mehner 2003)

• Application of angler motivation research to management might improve by adding context to angler motivation assessments
Research Questions

How do results about the importance of catch change if one adds specific trip contexts (target species) in angler motivation assessments?

• Questions
  – General versus context-specific angler motivations?
  – Angler types based on motivational similarity?
  – Contrast angler behaviours among types – are they consistent with specialization theory?
Methods

- **Study Area**
  - Mecklenburg-Vorpommern, Germany

- **Information on angling behavior:**
  - One-year angler trip diary
    - Sept. 2006 - Aug. 2007
    - 617 completed diaries (58% response rate)
    - ~13,000 trips

- **Information on motivations**
  - 20 page follow-up mail survey
    - personally tailored to individual respondents
    - 463 completed surveys (79% response rate)
Survey Task

1. Traditional Approach:
   - 10 item battery of motives
   - 7 catch / 3 non-catch

2. Context Specific Approach:
   Selection of MOST and LEAST important item for each fishing context

   Trip contexts are personalized from information provided in Angler’s Diary

   Top 3 species and locations (up to 9 combinations possible)
Results: Traditional Approach

As expected: Non-catch motives were more important than catch motives

<table>
<thead>
<tr>
<th>Challenge (Cr. Alpha = 0.78)</th>
<th>Mean importance rating (Mean +/- 2 S.E.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>to master angling-related challenges (MASTER)</td>
<td><img src="chart1" alt="Bar Chart" /></td>
</tr>
<tr>
<td>to outwit difficult-to-catch fish using a sophisticated technique (OUTWIT)</td>
<td><img src="chart2" alt="Bar Chart" /></td>
</tr>
<tr>
<td>to experience a challenging fight (FIGHT)</td>
<td><img src="chart3" alt="Bar Chart" /></td>
</tr>
<tr>
<td>to catch trophy fish (TROPHY)</td>
<td><img src="chart4" alt="Bar Chart" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Catch &amp; consume (Cr. Alpha = 0.62)</th>
<th>Mean importance rating (Mean +/- 2 S.E.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>to catch as many fish as possible (CATCH)</td>
<td><img src="chart5" alt="Bar Chart" /></td>
</tr>
<tr>
<td>to catch a fresh fish for a meal with family/friends (MEAL)</td>
<td><img src="chart6" alt="Bar Chart" /></td>
</tr>
<tr>
<td>to generate a supply of fish in the freezer for non-angling times (FREEZER)</td>
<td><img src="chart7" alt="Bar Chart" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Setting (Cr. Alpha = 0.44)</th>
<th>Mean importance rating (Mean +/- 2 S.E.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>to experience nature (NATURE)</td>
<td><img src="chart8" alt="Bar Chart" /></td>
</tr>
<tr>
<td>to enjoy solitude (SOLITUDE)</td>
<td><img src="chart9" alt="Bar Chart" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Socializing</th>
<th>Mean importance rating (Mean +/- 2 S.E.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>to be with friends/family (SOCIALIZE)</td>
<td><img src="chart10" alt="Bar Chart" /></td>
</tr>
</tbody>
</table>
Most anglers agree (low variance)
- Non-catch motives are somewhat to very important
- The most consumptive motives are not so important

Anglers show less agreement
- Importance of eating fish
- Challenge aspects of fishing
Adding context matters

Relative effort attributed to each MOST IMPORTANT MOTIVE

Challenge Species:

Consumptive Species:

Setting Species:

Multiple Motive Species:

Each species satisfies a different set of motives

<table>
<thead>
<tr>
<th>Species</th>
<th>Motivation Factor</th>
<th>Relative Effort</th>
</tr>
</thead>
<tbody>
<tr>
<td>carp</td>
<td>Challenge</td>
<td>40%</td>
</tr>
<tr>
<td>coarse fish</td>
<td>Consume</td>
<td>30%</td>
</tr>
<tr>
<td>eel</td>
<td>Non-catch</td>
<td>20%</td>
</tr>
<tr>
<td>perch</td>
<td>Challenge</td>
<td>40%</td>
</tr>
<tr>
<td>pike</td>
<td>Consume</td>
<td>30%</td>
</tr>
<tr>
<td>zander</td>
<td>Non-catch</td>
<td>20%</td>
</tr>
<tr>
<td>cod</td>
<td>Challenge</td>
<td>40%</td>
</tr>
<tr>
<td>flat fish</td>
<td>Consume</td>
<td>30%</td>
</tr>
<tr>
<td>herring</td>
<td>Non-catch</td>
<td>20%</td>
</tr>
</tbody>
</table>
Angler segmentation

- Based on context-specific motivation similarity
- Approach used in ecology for identifying trophic guilds

1. Tabulate a profile for each angler based on effort allocated to most important motive:

<table>
<thead>
<tr>
<th>Angler ID</th>
<th>Trophy</th>
<th>Meal</th>
<th>Nature</th>
<th>Solitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40%</td>
<td>20%</td>
<td>30%</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>30%</td>
<td>30%</td>
<td>0%</td>
<td>40%</td>
</tr>
</tbody>
</table>

\[ I_{1,2} = 0.50 \]

2. Create matrix-of-overlap index
   - Pair-wise comparisons between each angler (N x N matrix)
   - Index range: 0 (no primary motives in common) to 1 (identical profiles)

3. Perform hierarchical cluster analysis to identify types of motivation similarity
Results: Angler segmentation

4 clusters had single dominant primary motives

5th cluster emphasized several primary motives
Cluster Characteristics

- No differences in most demographics and general angling behaviours (e.g., number of trips per year, trip duration)

- Significant differences:
  - Age (p=0.01)
  - Years of angling experience (p=0.03)
  - Centrality of fishing to lifestyle (p=0.08)
    - Battery of 7 items (after Kim et al. 1997)
    - PCA resulting in a single dimension
  - Trophy and non-trophy challenge are the more specialized anglers in the spirit of Bryan (1977)
Fishing behavior comparison for carp and perch

Perch Fishing Behavior

- **Species Choice**
  - Non-trophy Challenge
  - Consumptive
  - Social
  - Trophy-seeking
  - Nature-oriented

- **Mean Angling Effort**

- **Mean One-way Travel**

- **Mean CPUE**

- **Mean Harvest Rate**

- **Mean Size of Largest**

### Graphical Representation:
- The graphs illustrate the comparison of fishing behavior for carp and perch, focusing on species choice, fishing effort, travel distance, catch per unit effort (CPUE), and harvest rate.
- Each category is compared across different behavioral types, with distinct bars indicating statistical significance.

### Statistical Significance:
- Bars labeled with similar letters indicate no significant difference.
- Bars with different letters indicate significant differences.

### Conclusion:
- The data highlights significant differences in fishing behavior and performance between carp and perch under various behavioral categories.
Conclusions and Implications

1. General motivation assessment reveals non-catch aspects are the most important expected outcomes.
2. But: Catch is important to some angler types and may be the primary motive when context is added in motivation assessments.
3. Different types of fishing (i.e., target species) fulfill different motives.
4. Five different motivational segments emerge, each with a distinct motivational profile and specific fishing behavioral pattern.
5. Adding context improves using motivation information for specific applications in management (specificity principle).
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