The “Lifeblood” of a Region

Assessing the Ecosystem Service Value of Streamflow for the Residents of the Salmon River Basin, Idaho

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Streamflow in the Salmon River Basin, Idaho

Climate change models predict reductions in streamflow rates as high as 20 to 40% by 2080 (Tang, Crosby, Wheaton, & Piechota, 2012)
Research Questions

- What is the value of streamflow?
  - Streamflow as opposed to water more broadly
  - Both monetary and nonmonetary values

Research Question A: **What is the economic base contribution of streamflow affected recreation industries?**
  - Regional economic assessment: Social Accounting Matrix
  - Quantitative modeling of monetary value

Research Question B: **What are the perceptions of the Salmon River and the ES benefits of streamflow?**
  - 120 structured interviews
  - Qualitative assessment of monetary and nonmonetary values

Research Question C: **What is the influence of the nonmonetary value of streamflow?**
  - Statistical analysis of interview narrative data
  - Quantitative assessment of the power of nonmonetary values
Ecosystem Services (Chan et al., 2012)
What is the economic importance of streamflow affected recreation activities (SARA) for the SRB economy?
Regional Economic Analysis

- Social Accounting Matrix (SAM)
  (Waters, Weber, & Holland, 1999)
- Location Quotients
- Impact Analysis of SARA
  (Beyers, 2005)
- Rafting Owner/Operator Survey
SARA Typology

6% of economic activity in the SRB
5.68 job multiplier
11% of the jobs in the SRB

Impact?

Research Question A Results
Impact Analysis of SARA Typology

- 5% SARA reduction =
  - 1% reduction in regional economic production
  - 11% regional job loss

- 20% SARA reduction =
  - 5% reduction in regional economic production
  - 41% regional job loss!
“How the river affects life here?”

85% mention economy

“...would affect our tourism, big time. Affect the floating industry and the fishing industry. And yeah, that would be, that would be very bad for our economy” (SLM_27, 2014)

“Well, that’s the - the sole economy. It’s based, um -- if it wasn’t for the river, we would have nothing. This town would’ve just dried up” (RIG_5, 2014)

“...still just a summer affair, you gotta make your living here, two months, two and a half months. Uh, that hasn’t changed” (STA_10, 2014)

Perceptions of Streamflow Benefits
“What’s it like to live here? Um, well, uh, from my perspective there’s just a ton to do. I mean, **the hard part is uh, finding a job** that you can make enough money **to even support yourself**. And if you have a family, your family, and getting to enjoy what’s, you know, what’s available in the outdoors (SLM_9, 2014)
Correcting Assumptions

- "Curse" of natural resources (Ploeg, 2011)
- Location Quotients (Dissart & Vollet, 2011)
- Mathematical formulas (Braak, Watson, & Rodriguez, 2011)
- Food Services and Drinking Places: .2% base vs. 1.9% gross
- Clothing stores account for 0% of the economic base of the SRB
- Inevitable disjunction in measurement (Chan et al., 2012)
- Qualitative nested within quantitative approaches (Busch et al., 2012)
Nonmonetary ES Values

- Cultural ES exist somewhere outside of ecosystems, contingent on culture (Kumar & Kumar, 2008)
- Cultural identity informed by perception of the environment (Lynch et al., 2012)
- Symbolic Interactionism (Stryker, 2008)
- Cultural ES often constrain ES assessment (Winthrop, 2014)
- “Culturality” of other instrumental ES (Pröpper & Haupts, 2014)
- Locally relevant Cultural ES help establish community culture
Qualitative Interview Methods

- Important distinction between the material reality of an ecosystem and the human understanding of the landscape (Belsky, 2011)

- The environmental benefits must be evaluated by directly engaging value-holders (Alam, 2011)

- Conducted 120 semi-structured interviews during the summer of 2014 in Riggins Stanley and Salmon
Conducting Interviews

- **Strategic sampling of key-informants** (Hansson et al., 2012)
- **Chain referral of specific populations via participant referrals** (Penrod, et al., 2003)
  - river rafters
  - ranchers
  - local business owners
  - long-term residents
  - new arrivals
  - seasonal residents
  - **Theoretical saturation**
- **Participant mapping**
- **Place attachment survey**
Qualitative Analysis of Interview Narratives

- **Interview questions adapted from place attachment studies** (Burley et al., 2007)
  - Ranging from broad to specific
  - What do you call this region?
  - “what does Salmon River Basin mean to you?”

- **Accessed the raw text in QSR International’s NVivo 10** (2012)
  - “How does the river affect life here?”

- **Consideration of maps** (Donovan et al., 2009)
Region defined in terms of change related directly to the Salmon River:

“Um, so when I was younger there was – when dad logged and it used to be big into the logging. We had a mill. So that – the population was bigger, it was more growing in size. And then as soon as that shut down and the logging kind of quit, it’s gotten more touris*ty*, more – I don’t like to say environmentalist, but people that are – which is fine, you know, there are more river rat people in the summers. *I love the river but I’m not a river rat.*” (SLM_32, 2014).
Hard But Rewarding Life

- Respondents live in the SRB in spite of economic opportunity, rather than because of it.

- "If it wasn’t for the river, this town wouldn’t be here. The mill burnt down, you know, so uh, you know, so it’s all kayaking, rafting, fishing, jet boat tours, up-river" (RIG_26, 2014)

“Oh, the river’s everything. You know that’s, that’s where everybody’s recreating, that’s um, the lifeblood of these ranches” (STN_41, 2014)
Lifeblood of the Region

- One of the most consistent responses in interviews was the use of “lifeblood” language to describe the river.

- “It’s – I think water’s life. Um, it’s my income. Uh, it’s my family. Um, if, you know, if not like my blood” (RIG_19, 2014).

“Lifeblood”
- 39% - Riggins
- 36% - Stanley
- 5% - Salmon

SRB is “Home”
- 13% - Riggins
- 24% - Stanley
- 29% - Salmon
## Comparing Communities

<table>
<thead>
<tr>
<th></th>
<th>Riggins</th>
<th>Stanley</th>
<th>Salmon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maps drawn based on watershed boundaries</td>
<td>36%</td>
<td>20%</td>
<td>42%</td>
</tr>
<tr>
<td>Participants names region based on “Salmon River”</td>
<td>46%</td>
<td>10%</td>
<td>19%</td>
</tr>
<tr>
<td>Include Stanley</td>
<td>14%</td>
<td>-</td>
<td>33%</td>
</tr>
<tr>
<td>Include Salmon</td>
<td>11%</td>
<td>17%</td>
<td>-</td>
</tr>
<tr>
<td>Include Riggins</td>
<td>-</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>Call SRB “home”</td>
<td>13%</td>
<td>24%</td>
<td>29%</td>
</tr>
<tr>
<td>Use “Lifeblood”</td>
<td>39%</td>
<td>36%</td>
<td>5%</td>
</tr>
<tr>
<td>River is an important place</td>
<td>75%</td>
<td>75%</td>
<td>58%</td>
</tr>
</tbody>
</table>
Me: "I just have one last question for you, what does 'Salmon River Basin' mean to you?"

Respondent: "It means the watershed other than just – I mapped it out. If you're going to refer to the map that is the Salmon River Basin to me. Except for Stanley. I cut Stanley off on the map."

Me: "But it is in the watershed right?"

Respondent: "Yeah, part of the drainage."

Me: "What about Riggins?"

Respondent: "Riggins is but I don't consider it part, I consider it part of the Snake River although Riggins doesn't consider it that way. They're cut off from us because we have that big no return wilderness that's impassable" (SLM_24, 2014)
Emergent Phenomena

- The River is life here. [laughs] Um, um, *it's life and death though, too*, you know. It’s like people die in the river every year, um, but that’s, you know, as far as tourism base, that’s – that’s the biggest one right there” (SLM_12, 2014)

- “Right now, *I don’t get along with her*”
- “My boyfriend died on it, 2 years ago” (STN_26, 2014)
- “You know, the impact of the river on me, we’re not friends, not right now. *But it was from the Forest Service that he died*, I blame the Forest Service every day of the week” (STN_26, 2014)
What is the influence or importance of the nonmonetary value of streamflow?
Quantitative Analysis of Interview Narratives

- Binary coding questions 6 through 21

- "Unprompted river" question codes were aggregated into a "river hits" continuous variable of a Poisson distribution

- Developed a 13 question Likert-scale place-attachment instrument (Kaltenborn, 1998; Brown and Raymond, 2007; Brown, Raymond and Weber, 2010)

- "River hits" correlated against place-attachment scores in a generalized linear regression set to a Poisson regression with "place-attachment" as a scale variable.
The Power of Unprompted River Reference

Results

Mean = 4.0351
Std. Dev. = 2.34211
N = 114
Place Attachment

Results
Correlation  \( P < .000, R \text{ Square: } .205 \)
Discussion

- Remembering the intentionality of narrators (Phelan, 2007) participants use the river as a significant symbol

- Dialectic symbolic interactionism of place (Bozatzis & Dragonas, 2011)

- The Salmon River contributes to a definition of place for residents with higher place attachment (Greg Brown, Raymond, & Corcoran, 2015; Gregory Brown & Raymond, 2007; Burley et al., 2007; Kaltenborn, 1998; Raymond et al., 2010)

- Bioregional experience based on similarly constructed (river related) place attachment (Manzo, 2006)
Community Fields

- Fields of “locality-oriented” interactions
  (Bridger, Luloff, & Krannich, 2002)

- “Members of a local population express a shared sense of identity while engaging in the common concerns of life” (Theodori, 2005)

- Social process based on: territory, shared identity, and local society
  (Wilkinson, 1991)

- Local society limited by management of the river

The importance of the Salmon River in for the identity of residents is a limitation due to federal management of the river. This presents implications for the resilience of these communities.
Resilience

- “Resilience” is a function of both: system inputs and community “adaptability” (Gallopín, 2006)

- Ability to contend with climate induced reductions to streamflow constrained by government regulation of common-pool resources (Folke, 2006)

- Need for greater collaboration across the region (Flint et al., 2010)

- Important implications for management of the Salmon River
Conclusion

- Tourism is a new form of resource dependence not as easily measured

- Communities in the Salmon River Basin are highly dependent on the Salmon River and vulnerable to climate change

- Rural, lifestyle rich, communities possess a sense of place stewardship that can be harnessed for collective ends
  
  (Gill, Klepeis, & Chisholm, 2010)

- Salmon River as a (Bio)regional field (Flint et al., 2010)
Questions?


NVivo qualitative data analysis software. (2012). QSR International Pty Ltd.


