

# Beavers and Flood Alleviation: Human perspectives from downstream communities

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## 1. INTRODUCTION

- **Natural Flood Management (NFM)** works with natural processes within the landscape and often delivers multiple benefits (e.g. habitat creation)<sup>1</sup>.
- **Eurasian beaver (*Castor fiber*)** modify landscapes through tree-felling, burrowing and dam-building<sup>2</sup>. Beavers can play a role in Natural Flood Management; their dams push water sideways onto floodplains, storing water and reducing flow rates<sup>3</sup>.
- **Beaver populations are re-establishing across Europe**, through a combination of natural recolonisation and reintroduction efforts<sup>4</sup>. In England, beavers are being reintroduced after an absence of 400 years. Beaver presence in modern-day England is a new concept for many people living there<sup>5</sup>.
- This study sought to **understand perspectives towards beavers and their NFM role** among some of the first communities to live downstream of beaver sites in modern-day England. This is the first time a study has focused on the downstream community as the focal stakeholders.

## 2. METHOD: Q-METHODOLOGY

- Purposively selected participants sort a series of statements. Correlations between entire configurations of participant sorts are examined using a factor analysis. Extracted factors indicate a shared perspective.
- Interpretation of factors using factor arrays and participant comments leads to a rich understanding of the shared perspectives identified.
- **Participants (n=39) were residents living downstream of three beaver sites** in England, where beavers have attenuated flow regimes<sup>3</sup>: Ladock, Cornwall; Lydbrook, Forest of Dean; and Sinnington, Yorkshire.



Eurasian beaver

## 3. RESULTS

- **Six shared perspectives (factors)** were identified (one of which exhibited both positive and negative correlations within the respondent pool).
- Factors were **polarised** as to whether they had favourable views of beaver, but the **prominent values varied**.
- **There was observable diversity of perspectives *within* communities**. These may be associated with local contextual experiences as well as different value judgements.

| Factor                  | Summary features   | Exemplar quote   |
|-------------------------|--|--|
| 1                       | <ul style="list-style-type: none"> <li>• Pro-beaver; eco-centric values.</li> <li>• Flood management should work with nature and help to restore natural environments.</li> </ul>            | "I think it's imperative that flood management works with nature, particularly at this critical time of climate change."   |
| 2                       | <ul style="list-style-type: none"> <li>• Anti-beaver, anthropocentric values.</li> <li>• Human-built flood measures are more reliable than beavers.</li> </ul>                               | "Man-made flood measures are predictable and work where they are required. Beavers are unpredictable. Beavers can flood river courses in the wrong areas, e.g. below / downstream from houses which can result in worse flooding." |
| 3: Positive correlation | <ul style="list-style-type: none"> <li>• Pro-beaver; value placed on economic benefit of beavers.</li> <li>• Beavers good for the environment, with potential for beaver tourism.</li> </ul> | "They are a keystone species".   |
| 3: Negative correlation | <ul style="list-style-type: none"> <li>• Anti-beaver; concern for negative impacts of beaver.</li> <li>• Beavers not good for the environment, and no benefit for local business.</li> </ul> | "Seen the damage they do???? Wait 'til they escape. [...] If you let them go there will be problems and then you'll be spending 20 years getting rid of them."   |
| 4                       | <ul style="list-style-type: none"> <li>• Anti-beaver; management-focused.</li> <li>• Beaver population would need management and regular monitoring.</li> </ul>                              | "If they are as destructive as I have heard them to be their numbers & effects will need monitoring."  |
| 5                       | <ul style="list-style-type: none"> <li>• Pro-beaver; anthropocentric values.</li> <li>• Beavers good for people, and pleased to have beavers upstream of their property.</li> </ul>          | "I think it[']s a great idea having beavers upstream and helping to slow the flow."  |
| 6                       | <ul style="list-style-type: none"> <li>• Pro-beaver; beaver-focused.</li> <li>• Would enjoy seeing beavers and visiting beaver wetlands.</li> </ul>  | "I enjoy seeing all wildlife in natural settings."   |

## 4. DISCUSSION

- Among pro-beaver factors, value is placed on **multiple benefits** provided, beyond flow attenuation alone.
- Anti-beaver factors exhibited lower confidence in beaver-led NFM and a perceived **sense of unpredictability** regarding where beavers dam. Reliance on beavers was viewed to be of high risk.
- **Beavers are the primary decision-makers** in beaver-led NFM, unlike in other interventions; even in other NFM approaches, humans are usually the primary decision-makers. Beaver-led NFM involves working with beavers to deliver NFM benefits: a true example of **working with natural processes**.

## 5. MANAGEMENT IMPLICATIONS

- Localised or **catchment-based approaches** to beaver management are advocated, to engage with and respond to diversity in perspectives within communities.
- To increase confidence within communities in beaver-led natural flood management:
  1. Seek to **familiarise individuals with beaver** activities and available management interventions.
  2. Beaver Dam Capacity Modelling indicates where beaver damming is possible<sup>7</sup>. **Localised dissemination of such knowledge** may provide some reassurance about where beavers can dam.
  3. Beaver Dam Analogues (BDAs) built by humans seek to mimic natural beaver dams or their hydrological function<sup>8</sup>. Some evidence suggests beavers may build dams upon BDAs<sup>9</sup>. Research is recommended to investigate whether **BDAs could be used as "starter dams"** to assist establishment of beaver territories in locations which **provide optimal flow attenuation benefits**. Might this alleviate the sense of unpredictability by encouraging beaver in desired localities?



Beaver dam



BDA, built on by beaver

Full paper:

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