# Beaver Management Groups

## Capturing lessons from the River Otter Beaver Trial and River Tamar Catchment

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Cover Photo: Eurasian beaver on the River Otter. (Photo Credit: R.E. Auster)



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# Project details

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### Dr R.E. Auster

Dr. Auster conducts interdisciplinary environmental social science, seeking to critically explore issues in reintroduction and restoration. Supervised by Barr & Brazier, he recently concluded a PhD looking at the human dimensions of reintroducing beavers into England. He has published a series of peer reviewed papers in the field, investigating both potential benefits and conflicts associated with beaver reintroduction. Auster was a contributing member of the River Otter Beaver Trial Science & Evidence Forum as a specialist in social research, and he co-authored the Trial's Science & Evidence Report.

### Prof. S.W. Barr

Prof. Barr has over twenty years of experience in the geographies of sustainable development through engaging with place-based communities. His work has included research in behavioral change theory, community resilience to environmental change, and sustainable travel and tourism. Recent work has included study of environmental governance and climate change knowledge co-production at the community scale through the use of social learning techniques, to co-construct understandings of flooding and climate change. Barr's transferable skillset and knowledge has been applied in his recent supervision of Auster through his PhD on the human dimensions of beaver reintroduction and co-authorship of outputs emanating from this research.

### Prof. R.E. Brazier

Prof. Brazier has over twenty years of experience in environmental science, specialising in research to understand the environmental effects and social impacts of landscape restoration. He was the Chair of the River Otter Beaver Trial Science & Evidence Forum, lead author of the Trial's Science & Evidence Report, scientific advisor to the Trial's Management group and participating member of the Trial Steering Group. Brazier also

leads on the monitoring and evaluation associated with several other beaver reintroduction projects in both England and Scotland, notably the Cornwall, Forest of Dean, Dorset Wildlife Trust and National Trust Holnicote beaver reintroduction projects. Brazier is also leading the development of the Centre for Resilience in Environment, Water and Waste – a partnership facility between University of Exeter and South West Water, which embodies the holistic approach to understanding progressive environmental change that is needed to address problems of climate change.


## Keywords

Beaver Management Groups, Eurasian Beaver, Reintroduction, Renewed Coexistence

## Acknowledgements

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## Further information

This report can be downloaded from the Natural England Access to Evidence Catalogue: http://publications.naturalengland.org.uk/. For information on Natural England publications contact the Natural England Enquiry Service on 0300 060 3900 or e-mail enquiries@naturalengland.org.uk.

# Executive summary

- Interest is growing in the potential for Eurasian beaver (*Castor fiber*) reintroduction in England. Beaver activities may lead to both beneficial and negative impacts for people and the environment.

- National-level decisions are currently being made on future approaches to beaver reintroduction and management. Within this, a potential role for localised 'Beaver Management Groups' is being considered.

- This report seeks to capture lessons from the experiences of groups governing beaver management in two settings in south-west England: the catchments of the River Otter and the River Tamar.

- This report draws on findings from a previous, peer-reviewed study that captured the experiences of stakeholders involved in governing the River Otter Beaver Trial (ROBT) (Auster et al., 2022b), and explores the applicability of those findings to Beaver Management Group settings. This is achieved through an analysis of interviews with individuals involved with beaver management in the Tamar catchment.

- The findings are discussed in relation to six primary themes, drawn from the previous study: 1) Project Governance; 2) Stakeholder Engagement; 3) Research and Monitoring Programme; 4) Strategy to Manage Arising Conflicts; 5) Public Engagement; 6) Broad Perspectives on Reintroduction Trials. A summary of points is available in Table 1, followed by full discussion in the main body of this report.

- Through the analysis it is identified that, if and where Beaver Management Groups (BMGs) exist, they are not a fixed structure but are in themselves a *process* through which renewed coexistence between humans and beavers could be facilitated in catchment settings.

- There are three identified stages in the Beaver Management Group process:

    i. **Formation** - The foundation stage, involving high investment in stakeholder identification, relationship-building, and knowledge-sharing.

    ii. **Functioning** - The phase in which a group is in action, involving the engagement of stakeholders and communities with an adaptive membership, and the management of both beaver populations and human-beaver interactions.

iii. **Future?** – There are questions about the future need and/or role of BMGS in the long term. This is an area for continued learning and research, as people and beavers learn to coexist in English river catchments.

- Three external factors are then identified to have influence upon the three stages of this process:

  i. **Reaction or Pro-action.** Proactive BMGs may form prior to beaver presence in a catchment, and reactive BMGs may form where beavers already exist. There is potential for higher tensions with and between stakeholders in reactive BMGs, depending on views of the reintroduction process.

  ii. **National Context:** National-scale decisions are being made which will interplay with the running of a beaver management group. This may inform what a BMG may be able to achieve, and how it relates to statutory or regional agencies.

  iii. **Resource Limitations:** Financial or time constraints may influence the ability of a beaver management group to achieve its objectives of maximising benefits and minimising conflicts associated with beaver reintroduction.

- The three stages of the Beaver Management Group process and its external influences are visualised in Figure 1 (with inclusion of specific points raised by study participants) on the following page.

**Figure 1. Visualisation of the three stages of the Beaver Management Group process and external influences.**

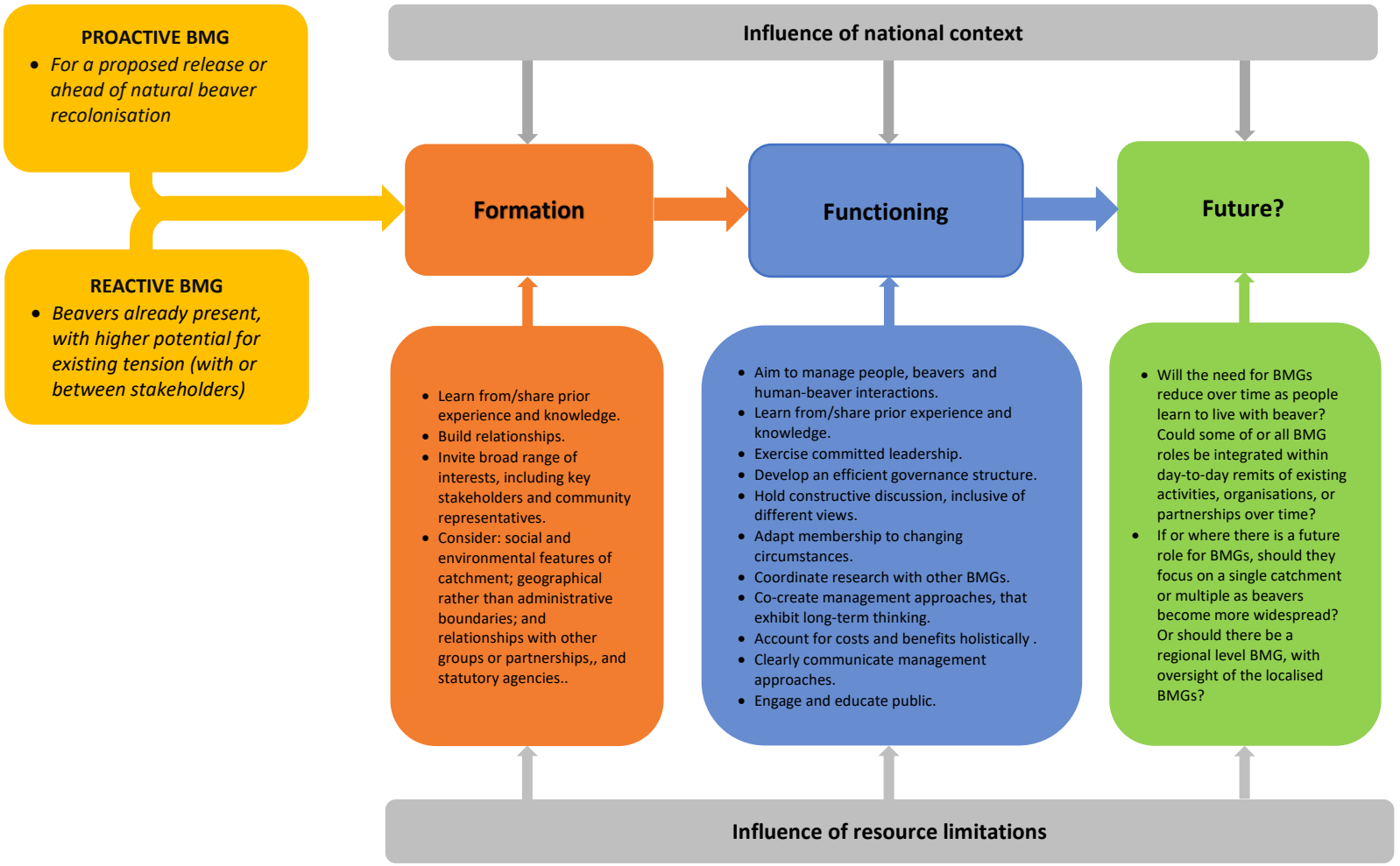

**Table 1. Summary of report findings (which are discussed in full in the main body of this report).**

| Theme | Subtheme | Lessons learned | Examples from ROBT and Tamar BMG Contexts |
|---|---|---|---|
| **Project Governance** | Project Objectives | Clearly define project objectives.<br><br>Provide a localised approach to beaver management (see Box 1). | ROBT was a nationally significant trial, seeking to answer key research questions.<br><br>Tamar BMG is localised with the objective of managing human-beaver interactions, and beaver population health. |
| | Leadership | Needs to be committed, open, honest, and transparent.<br>Recognise both benefits and conflicts. Learn from prior experiences. | DWT now leading BMG with prior experience from the ROBT. Other organisations elsewhere may not yet have such experience. DWT are looking to share knowledge and provide training regarding human-beaver interactions. |
| | Structure | Needs to be able to meet objectives, whilst being simple and resource-efficient.<br><br>Adaptive to changing circumstances.<br><br>Strategic thinking: what is the future need and/or role of BMGs, and how do they relate to other groups or partnerships? (See Table 3) | ROBT structure was designed to meet the trial's nationally significant objectives.<br><br>Tamar BMG structure was informed by that of ROBT but has been simplified and is adapting to changing circumstances. |
| | Resourcing | BMGs require time and financial resource. | Tamar BMG a simpler governance |

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| | | Availability of resources is a key issue.<br><br>Time required of both leads and members, including for: relationship-building; planning; group meetings; and subsequent actions. | structure than the ROBT's, with one forum meeting a year in summer. |
| **Stakeholder engagement** | Outreach | Represent a range of interests. Consider: who is likely to be affected, both positively and negatively; who is required to make decisions (and relationship with statutory agencies); and the representation of the wider public/local communities.<br><br>Invest in relationship-building.<br><br>Reflect geographical rather than administrative boundaries, due to the nature of how beavers behave and move through the landscape.<br><br>Stakeholder interests may vary between catchments, e.g. different landownership patterns (see Table 4).<br><br>BMG membership needs to be adaptive to changing circumstances. | ROBT Steering Groups had a wide range of interests represented, and the membership reflected the national significance of the trial.<br><br>Tamar BMG representation is on a more localised level. |
| | Respectful, constructive discussion | Be inclusive of different voices.<br><br>Ability to learn from each other (including both beneficiaries and negatively impacted parties). | ROBT Steering Group members reported that there were points of disagreement, but that they were discussed respectfully. |

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| | Challenges | Some challenges for stakeholder engagement have been identified (see Table 5). These include: participation from stakeholders; reputational risk; risk of partnership breakdown; use of stakeholder resources; large number of stakeholders to represent; relationship with other groups (e.g. catchment partnerships). | No partnership breakdown was reported for ROBT or Tamar BMG. |
| | Value of participation for stakeholders | Benefits of stakeholder participation include: strengthening relationships with other stakeholders; opportunity to learn about beavers and their ecology; opportunity to be better informed to adapt own operations; opportunity to participate in discussion. | ROBT Steering Group stakeholders reported their participation to have been of value. |
| **Research and Monitoring Programme** | Broad reception | | ROBT stakeholders viewed the trial's research and monitoring programme positively. It was reported to have provided an evidence-base for decision-making, although with some further research questions outstanding. |
| | Programme focus | If a BMG is to have a research programme, this does not need to be as intensive as that required of a reintroduction trial.<br><br>Potential research working sub-groups could address specific questions.<br><br>Coordinate research efforts with other BMGs. | Research programme in ROBT was co-created with stakeholders.<br><br>ROBT more research-intensive in reflection of its role as a nationally significant trial. Tamar BMG is localised and focused on management issues so there is less focus on research, although the governance framework allows |

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| | | | potential for research working sub-groups. |
| | Feasibility limitations | Practical, temporal, and financial limitations may limit the feasibility of research programmes. | Nationally significant ROBT research was resource intensive. This is not feasible to replicate in localised BMGs. |
| | Objectivity | Objectivity in a research programme may help maintain trust with certain stakeholders. | A researcher in the ROBT reported they had sought to address questions of objectivity with scientific peer review of their results. |
| **Strategy to manage arising conflicts** | Need to manage conflicts | Availability of management support likely to reduce potential for polarisation and conflict escalation (see Box 4). | There were reports of initial frustration from landowners in the ROBT, but the Field Officer's efforts to empower landowners in beaver management were reported to have been received well. |
| | When to intervene | Proactive intervention more likely to reduce potential for conflict escalation. When proactive | |
| | Clear communication | Give high quality, pragmatic advice.<br><br>Provide clarity on available management options (see Box 5).<br><br>Have a clear contact point. | ROBT had a dedicated field officer. |
| | Long-term thinking | Where possible, anticipate future challenges and address them early. | ROBT produced the 'Beaver Management Strategy Framework' document, which |

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| | | Empower individuals by sharing knowledge on how to manage beaver impacts.<br><br>Availability of financial resources will limit management interventions. However, fewer resources may be required in future as people adapt and learn to live with beavers. | considers changing circumstances as beaver populations grow. This includes a 'hierarchy' of management actions: education first, then risk avoidance, mitigation, translocation, and finally lethal control. |
| | Contextual conflicts | Beaver behaviours remain the same so many conflicts are likely to be similar between catchments.<br><br>BUT catchment-specific features can mean there are contextual conflicts (see Table 6). | Three examples of catchment-specific conflicts:<br><br>There is more public access in the River Otter catchment than in the Tamar, meaning beaver activity is more visible and there are more access points for surveying.<br><br>Tamar catchment has a more significant salmonid fishery than the Otter, meaning there is greater potential for interaction with salmonid fishery interests.<br><br>Tamar is a larger catchment than the Otter, meaning it is more resource-intensive to survey. There is also potential for a bigger beaver population. |
| | Influence of national context | National policy decisions will influence what advice BMGs can give, or what actions BMGs can take. | Recent indication that beavers will be able to remain on River Tamar provided confidence for the lead organisations to |

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| | | Currently uncertainties exist about the future, notably on the influence of decisions on legal protection for beavers or availability of funding resource for BMGs and beaver management. | continue with formation of the Tamar BMG. However, there are uncertainties about future approaches to management that will depend on national policy decisions. |
| **Public engagement** | Importance of public engagement | Facilitate normalisation of beavers as a wild animal, and help people learn to live with them.<br><br>Address misinformation and raise public awareness.<br><br>Share knowledge and experience. | DWT have held training days to share knowledge and experiences of beavers and beaver management, which have included field site visits. |
| | Reach and tone | Needs to be reflective of context.<br><br>There is potential for beaver tourism (see Box 6) and educational opportunities. | DWT invested in an extensive engagement programme for the ROBT as it was a trial of national significance. Level of resource has reduced now the trial is over and beaver presence in the catchment is viewed by the organisation as somewhat normalised. A lower key approach has been taken in the Tamar catchment for multiple reasons, including: uncertainty about the population status; less public access; and 'normalisation' of the sense that beavers are present in Devon. |

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| **Broad perspectives on reintroduction trials** | ROBT as a model | ROBT model viewed favourably by Steering Group stakeholders, but it was a resource-intensive structure that may be challenging to replicate. | Some tensions observed in response to the Trial being established reactively to beaver presence, rather than proactively ahead of reintroduction or natural recolonisation of a catchment. |
| | Species variance | Trials for other species may not need to be as resource intensive as ROBT as beavers have more significant landscape-scale impacts. | |
| | Scale, duration and population decisions | Future trials will need to consider the scale and duration of a trial as well as the desired species population size, in reflection of what is required to meet the objectives. | |

# Contents

# 1. Introduction

The Eurasian beaver (*Castor fiber*) is a species of semi-aquatic rodent that has a range of impacts on riverine landscapes, through dam-building, burrowing, and foraging behaviours – of which tree-felling is one (Brazier et al., 2020b; Howe, 2020; Larsen et al., 2021; Rosell & Campbell-Palmer, 2022). These behaviours have potential to support wider biodiversity by creating habitat complexity (Law et al., 2019; Nummi et al., 2019; Stringer & Gaywood, 2016). They also have potential to restore natural river function, leading to improvements in water quality and the attenuation of flow rates, thereby reducing downstream flood risk (Auster et al, 2022a; Puttock et al., 2017, 2020).

The Eurasian beaver (hereon referred to as beaver) was historically native throughout Great Britain, until approximately 400-500 years ago (Brazier, et al., 2020b; Gaywood, 2018; Halley et al., 2020). Similarly, beavers were historically present throughout mainland Europe, but they were reduced to an estimated 1200 individuals in eight isolated populations by the beginning of the 20th century (Halley et al., 2020). Now, beaver populations have recovered throughout Eurasia through a combination of reintroduction efforts and natural recolonisation; they are present throughout much of their historical range (Halley et al., 2020).

In Scotland, following a trial reintroduction in Argyll and assessments of a wild population living in the catchment of the River Tay, beavers were listed as a European Protected Species in 2019, marking beavers as the first formally reintroduced extinct mammal in Great Britain (Gaywood, 2018; Jones & Campbell-Palmer, 2014; Tayside Beaver Study Group, 2015). There are presently no legal wild beaver populations in Wales, but several fenced enclosures exist, including a licensed project at Cors Dyfi Nature Reserve (Wildlife Trusts Wales, 2012). Decision-making is devolved to NatureScot and Natural Resources Wales for beavers in Scotland and Wales, respectively.

Interest in reintroducing beavers to England has grown in recent years, and the 25 Year Environment Plan includes provision to consider reintroduction of formerly native species - with specific reference made to beavers (HM Government, 2018). Between 2015 and 2020, a reintroduction trial took place on the River Otter in East Devon (see 2. Study Context). In 2020, Natural England concluded that the trial had been a success and UK Government announced that the River Otter beavers may legally remain and disperse naturally (HM Government, 2020; Howe & Crutchley, 2020). Beavers were also released into 25 fenced enclosures between 2000 and 2021 (Heydon et al., 2021), and license applications for new fenced projects continue to be brought forwards. Further, a recent report for Natural England identified several small wild beaver populations of unknown origin on the: River Stour (Kent); River Tamar (Devon); Rivers Avon, Frome & Brue (Somerset & Wiltshire); Little Dart River (Devon); and the River Wye (Herefordshire) (Heydon et al., 2021).

Alongside potential benefits for water flow attenuation, habitat improvement, water quality and wildlife tourism (Brazier et al., 2020b; Howe, 2020), beaver activities can conflict with human activities or infrastructure. For example, localised flooding upstream of a beaver dam may conflict with land or property, or beavers may fell trees that hold a social and cultural significance (Auster et al., 2021b; Brazier et al., 2020b; Campbell-Palmer et al.,

2016). Management techniques exist that can mitigate or prevent conflicts (e.g., the installation of flow devices through beaver dams to limit the maximum water level to a desired height, or the use of wire mesh/specialist paint to deter beavers from felling particular trees). For a comprehensive overview of available management techniques, see Campbell-Palmer et al (2016).

In 2021, DEFRA held a national consultation on potential future approaches to beaver reintroduction and management. Within these proposals were consideration of localised Beaver Management Groups (BMGs) and Local Beaver Officers as one possible approach to engaging with local stakeholders in beaver management (DEFRA, 2021).

In Devon, the River Otter Beaver Trial had a governance structure which engaged with a range of stakeholders, and a Beaver Management Group (BMG) is in development for the River Tamar catchment (see 2. Study Contexts). Thus, Natural England commissioned this report to capture lessons from the management groups within these settings and to explore their applicability for other contexts, if and where there may be a role for Beaver Management Groups in future. This report will offer an understanding of how two existing groups function and of their approaches to engagement and management, thereby providing further evidence to help support decision-making regarding a national approach to beaver management.

This report will first describe the study contexts of the River Otter Beaver Trial and beavers in the River Tamar catchment, before outlining the methods and results. The findings that are presented will draw upon a recent and separately conducted, peer-reviewed study that captured the experiences of stakeholders who sat on governance groups for the River Otter Beaver Trial (Auster et al., 2022b). This then provides the foundation for analysis of new data generated through a series of interviews with individuals who have so far been involved with the emerging River Tamar Beaver Management Groups.

# 2. Study Contexts

## 2.1. River Otter Beaver Trial

**County: Devon, with the top extending into Somerset**

**Catchment size: Approx. 250km$^2$**

Evidence suggests beavers may have been present on the River Otter as early as 2008, and this was confirmed when they were caught on camera trap in 2013. The source of these beavers was - and remains - unknown, but the footage included a mother with kits which confirmed they were breeding. Following press attention, and with their source and health status unknown, DEFRA intended for the beavers to be removed from the river. A locally driven campaign to keep the beavers on the river ensued (Crowley et al, 2017).

Devon Wildlife Trust had been monitoring a beaver research enclosure elsewhere in Devon since 2011, and so proposed that they could draw upon this experience to monitor the population and their impacts in a reintroduction trial. With considerable local public support in favour of keeping the beavers, Natural England issued Devon Wildlife Trust with a licence to release the beavers following health screening and monitor the population in 2015. The license was to cover a five-year period, conditional on a health assessment (undertaken by Royal Zoological Society of Scotland) and the collation of evidence of the beavers' impacts on society and the environment (Natural England, 2015), and required Devon Wildlife Trust to take responsibility for managing the beaver population between 2015 and 2020. The licence also included provision for the release of up to five additional animals to diversify the gene pool.

The Trial was monitored according to a 'Monitoring Plan', the development of which was informed by the licence criteria set by Natural England. This included an exit strategy that could be triggered, if certain criteria were met (Devon Wildlife Trust, 2017). To govern the Trial, Devon Wildlife Trust established a governance framework that involved external organisations and stakeholders at various levels, exhibiting a wide range of interests. A summary of the governance framework for the Trial is provided in Table 2.

In the final year of the Trial, the Steering Group convened a Beaver Management Working Group and published a *'Beaver Management Strategy Framework'* document, detailing proposals for the future management of the River Otter beavers, drawing on learning from the Trial and elsewhere (River Otter Beaver Trial, 2019). This includes proposals for a hierarchy of management actions: "*...beaver management will be approached via a strict hierarchy of actions of increasing impact: education, risk avoidance, mitigation, trapping and relocation, and finally (in the absence of any other suitable alternative) lethal control)* (page 9).

When the Trial concluded, the River Otter Beaver Trial Science & Evidence Report was published, which reported on all evidence gathered during the Trial period (Brazier et al., 2020a). This has subsequently been supported with a series of peer reviewed publications. In August 2020, Natural England declared that the Trial had been a success, and UK Government announced that the River Otter beavers were to be allowed to remain and disperse naturally (HM Government, 2020; Howe & Crutchley, 2020).

The latest estimate is that there are about twenty beaver territories or family groups on the river. At the time of writing, Devon Wildlife Trust continue to monitor these, but are considering the future governance frameworks for beaver management within the catchment with the Steering Group partners. This may involve a different framework to the one used during the Trial stage as it moves from a nationally significant trial to a localised Beaver Management Group; no firm decisions have yet been made.

**Table 2. Governance framework for the River Otter Beaver Trial (adapted from: Auster et al., 2022b)**

| Hierarchy level | Group | Role | Members/participants | Chair |
|---|---|---|---|---|
| 1 | **Licence group** | To monitor compliance with the licence | Statutory agencies, local authorities, trial partners | Natural England |
| 2 | **Project management group** | Responsible for day- to-day delivery and management of the Trial | Partner organisations | DWT |
| 2 | **Steering group** | To provide oversight from key stakeholders and provide Project Management Group with scrutiny, advice, and support. Key role to assess exit strategy triggers annually | High-level representation from wide range of key stakeholder groups | DWT |
| 3 | **Beaver management** | Formed by steering group | Subset of SG members | DWT |

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| | **strategy framework working group** | and tasked with development of post-2020 beaver management strategy framework | | |
| **3** | **Science and evidence forum** | Oversee development and delivery of monitoring plan, in an objective and scientific manner<br><br>To publish Science and Evidence Report summarising research findings | Academic researchers and other stakeholders involved in monitoring and evidence gathering | University of Exeter |
| **3** | **Fisheries advisory forum** | Specialist group to advise ROBT in respect to fisheries interests | Key national and local fisheries organisations and syndicates | Clinton Devon Estates |
| **3** | **Community and education forum** | Public information exchange | Local community members, ROBT volunteers, landowners within trial catchment | Devon County Councillor |
| ***3*** | *Internal DWT Communications Group* | *Coordinate communications and fundraising* | *DWT* | |

## 2.2. Beavers in the Tamar Catchment

**Counties: Devon and Cornwall**

**Catchment size: Approx. 1820km2**

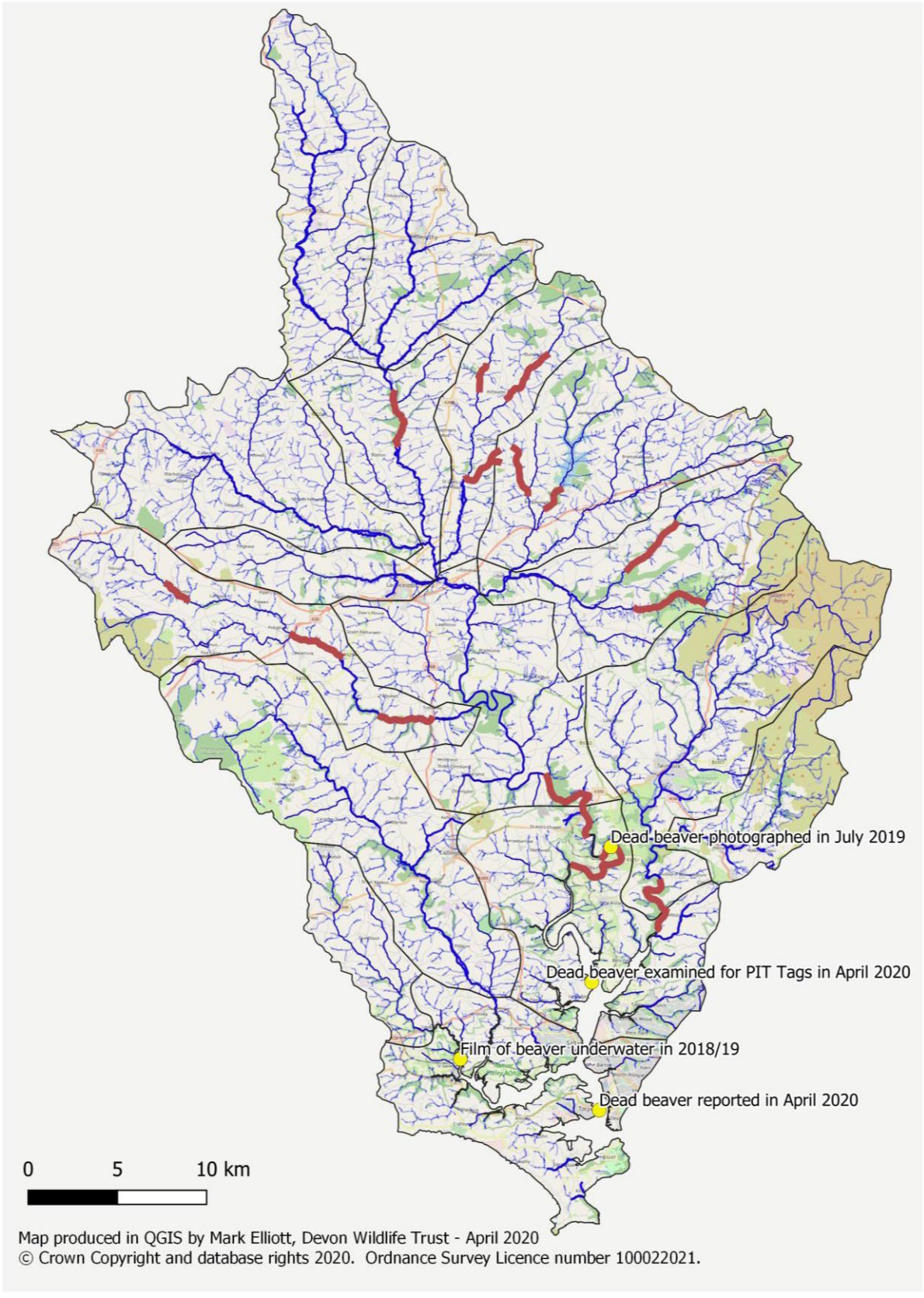
The potential for beavers in the River Tamar catchment was first raised in 2007/2008, when South West Water proposed a beaver release upstream of Roadford Reservoir. The intention behind this would be to improve the water quality entering the reservoir. At an early stage of discussions however, this was met with significant local opposition and a local campaign group was formed. South West Water dropped their plans, and no beavers were released.

Later, Devon Wildlife Trust partnered with a landowner in the catchment and, in 2011, a pair of beavers was released into a fenced enclosure. The intention was to scientifically monitor the impacts of those beavers upon the local environment, including upon water quality and water storage. This enclosure still exists and continues to be monitored by Devon Wildlife Trust, in partnership with the University of Exeter (see Devon Wildlife Trust, 2016, and Puttock et al., 2017).

During the timeframe of the River Otter Beaver Trial, Devon Wildlife Trust (DWT) began to be contacted by landowners within the wider Tamar catchment, regarding reports of beaver activity. At this time, DWT had no responsibility or funding for management of beavers on the River Tamar, but it was public knowledge that DWT were running the River Otter Beaver Trial. Similarly, Cornwall Wildlife Trust received a small number of reports from the Cornish side of the catchment. Gradually, DWT received further reports of beaver presence, and on occasions they met with a small number of landowners to investigate and provide advice. The source of the Tamar beaver population remains unknown (and they have not originated from DWT's enclosed project, which has been closely monitored).

In 2020, DWT were commissioned by Natural England to produce a status report on the presence of beavers in the Tamar. Beavers were estimated to be present in 14 sections of the River Tamar or its tributary rivers (the Rivers Carey, Inny, Lew, Lyd, Tavy and Wolf) (Figure 2). However, due to the onset of the COVID-19 pandemic, DWT were unable to verify some of these locations (Elliott, 2020).

**Figure 2. Status of beavers in the Tamar catchment, April 2020 (source: Elliott, 2020).**



Whilst not yet holding a remit for monitoring beavers on the River Tamar, DWT hosted a first meeting with a small number of possible organisations in September 2019 for an initial conversation about the management of beavers in the area. Then, in 2021, DWT received funding from the Devon Environment Foundation and a number of other organisations. This included support for DWT to set up a Beaver Management Group for the catchment. A further meeting was held (with what is now the established 'Delivery Partnership') in February 2021. This established an initial governance structure for the River Tamar beaver population, which was formalised in Terms of Reference for beaver management on the River Tamar in September 2021. As part of a wider DWT managed project, the group has now received philanthropic funding to support elements of its activities in the coming year.

The current governance framework (Figure 3) for the River Tamar comprises of three distinct groups:

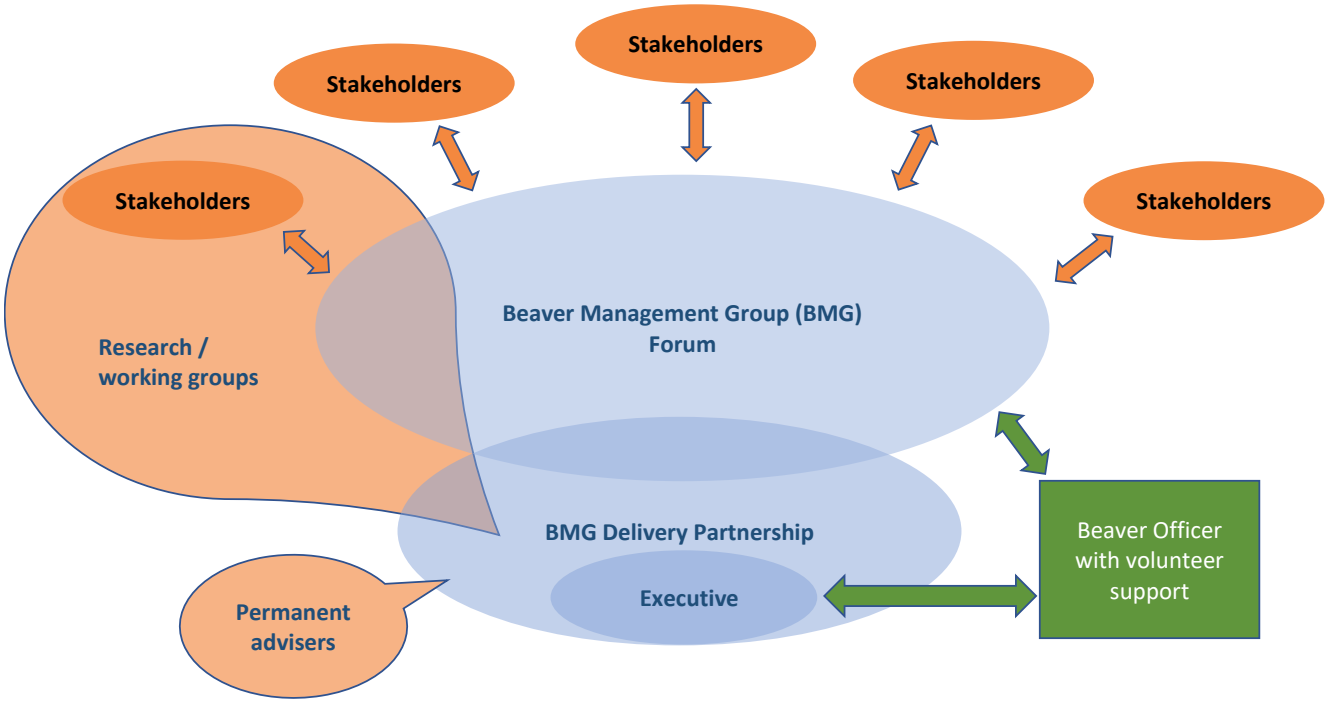
- **The Beaver Management Group Forum**, which aims to meet annually. This group seeks to represent the '*wide range of interests held by the various stakeholder groups in the catchment*', and to '*support the dissemination of information regarding beavers, their ecology and management*'. The terms of reference provide allowance for further direct discussions with and between stakeholder groups. The membership of this group is expected to be dynamic, in reflection of changing circumstances related to beaver activities over time.

- **The Beaver Management Group Delivery Partnership**, which is set to meet three times a year, and is a smaller group than the wider Forum. This group seeks to support the delivery of a Beaver Management Plan, and to *'ensure that approaches to the management of beavers is based on a sound scientific understanding and conservation status within the catchment, and associated opportunities and risks associated with their activities*'. Its membership consists of the lead partnership organisations (Devon Wildlife Trust, Cornwall Wildlife Trust, and Beaver Trust); organisations that have provided financial support; organisations that have a network of local land advisors; and organisations with a statutory function.

- **The Executive Group** who are to meet more frequently as required. This group has a select membership and seeks to '*provide a secretariat function for the Forum and Delivery Partnership'*, as well as to 'lead the coordination of beaver management, advice, and stakeholder communication activities.

- In addition, there is allowance within the governance framework for subsets of the groups to participate in research working groups to address specific questions. The terms of reference facilitate stakeholder involvement with these smaller working groups.

**Figure 3. The governance framework for beaver management (source: Tamar Beaver Management Group Terms of Reference, September 2021. Reproduced with permission.)**




At the time of writing, this remains the governance framework. However, a Delivery Partnership meeting was held on 8th March 2022, and this governance framework was on the agenda for discussion. As a result, this structure is likely to change. Suggestions included the potential introduction of a Devon-wide BMG consisting of key regional-level representatives and organisations with a statutory function, to provide strategic oversight of locally based BMGs. No firm decisions have yet been made.

The first meeting of the Beaver Management Group Forum was held in July 2021 (as England emerged from tight COVID-19 pandemic restrictions). A second Forum meeting is expected to be held in summer 2022.

# 3. Methods

This report will outline findings from a previous study which captured stakeholder experiences from the River Otter Beaver Trial and present an analysis of newly generated interview data from the River Tamar context, exploring the applicability of those previous findings to BMG contexts.

## 3.1. Previous study capturing experiences from the River Otter Beaver Trial

Prior to this commission, the researchers undertook a study that captured the experiences of stakeholders who sat on the River Otter Beaver Trial Steering Group, Science & Evidence Forum, and Beaver Management Strategy Framework Working Group. The results of this study have been peer reviewed, and full details are available in the resulting academic publication:

> Auster, R. E., Barr, S. W., & Brazier, R. E. 2022. Renewed Coexistence: Learning from Steering Group Stakeholders on a Beaver Reintroduction Project in England. *European Journal of Wildlife Research, 68*, 1. https://doi.org/10.1007/s10344-021-01555-6

This study involved a qualitative online survey in 2020 (conducted online-only due to COVID-19 pandemic restrictions in place at the time).

All members of the three groups were invited to take part, including representatives with a broad range of interests. Such interests included: water; wildlife; environment; farming; landownership; forestry; and local governance (or local authorities). Statutory agencies were also represented. Nineteen of the possible twenty-six group members took part.

Themes were identified from the data using an inductive thematic analysis (Figure 4). An overview of these findings will be presented in this report, in relation to findings from the newly generated interview data.

For full methodological details for the previous study, please see the prior publication.

**Figure 4. Summary of themes and subthemes identified in Auster et al., 2022b**

## 3.2. Interviews with participating members of the Tamar Beaver Management Group

### 3.1.1. Interview design

Interviews were informed by the previous study and co-created between the researchers and Natural England; the researchers proposed a set of initial questions upon which Natural England provided comment. This was to ensure that the interviews would address the objectives of the Natural England commission.

The interviews were designed with a semi-structured format. This ensured that key areas of interest for the commission would be covered, whilst allowing for participants to guide the interview, with flexibility for exploring new insights that may arise in interview.

An overview of the question coverage is given in Appendix 1.

### 3.1.2. Participants

The interview participants were purposively selected individuals who have been involved with beavers or the Beaver Management Groups within the River Tamar catchment. For ethical reasons (see 4. Study Ethics), the initial interview participants were members of Devon Wildlife Trust, thus allowing the experiences of the primary leads for Beaver Management Group formation to be captured. With their agreement, further individuals were invited to participate to capture other perspectives, including representatives of two other organisations involved in a Beaver Management Group leadership role; a representative of a large salmonid fishery within the catchment who had attended the first forum meeting; and a couple who were landowners who had attended the first forum meeting, who have also had beavers on their land since 2014. (One further invitation was extended to a second landowner couple who had experienced conflicts with beavers and attended the first forum meeting, however no response was received to this invite).

A summary of interview participants and their relationship with beavers in the Tamar catchment is given in Appendix 2. To protect participant identities, each has been given an anonymised Participant ID number.

Interviews took place between 24th January and 16th February 2022, with each taking 49 minutes on average (range 32-75 minutes, total of 448 minutes). Interviews were subjected to a COVID-19 fieldwork risk assessment. As part of this, participants were offered the choice of participating in person, or online (four participants opted for the latter). With participants' consent, interviews were audio recorded for the purposes of

analysis only (recordings have since been deleted). All interviews took place one-on-one with the researcher, except for the landowner couple who participated in the same interview (this was naturally occurring variation, and the couple had a shared experience of beaver presence and the Beaver Management Group).

### 3.1.3. Analysis

Interviews were first transcribed verbatim from the audio recordings, before being coded with a hybrid deductive-inductive approach in Nvivo 12 software.

In the first instance, the six themes (including the subthemes) which were identified in the previous study were used as a coding framework (Figure 4). This approach was chosen to explore the applicability of findings from the River Otter Beaver Trial Steering Group stakeholders, but within the context of the River Tamar catchment. However, new codes could also be generated from the data using an inductive approach, thereby enabling the identification of any new insights within the data; two new subthemes were identified under ‘Strategy to Manage Arising Conflicts’ (*Contextual conflicts*, and *Influence of national context*).

# 4. Study Ethics

This study was approved by the University of Exeter's Geography Department Ethics Committee, prior to starting interviews.

Key ethical considerations included:

- **Informed Consent**. Participants were provided with details of the research information prior to the project taking place. This outlined the project aims and funders, and it highlighted the voluntary and anonymous nature of participation. Participants were then asked to give written consent (either with a digital signature, or in person with a written signature). Participants were able to withdraw from the study at any time.
- **Data Protection.** To protect participant anonymity, no personal details have been shared or presented within this report. All data was stored securely on a University of Exeter hosted site, to which only the authors of this report were granted access.
- **Presentation of Perspectives.** To ensure interview participant perspectives were accurately reflected in this report, all individuals who took part in an interview were provided with the opportunity to comment on the representation of their views within the document. This took place whilst it was still in an editable format and prior to its publication.
- **Researcher Influence.** The situation in the catchment of the River Tamar is evolving, and the formation of the Beaver Management Group is in very early stages. Prior to the project beginning, concerns were raised by Devon Wildlife Trust (as primary leads for the Tamar Beaver Management Group's formation) that the presence of researchers could negatively influence what is currently a sensitive, relation-building phase of development. In response to this concern, the aims of the project were discussed with Devon Wildlife Trust; initial interviews were planned only with Devon Wildlife Trust to capture the perspectives of group leads; further individuals to interview were identified where relationship have already been built; all participants had an opportunity to comment on the representation of their views in the report, prior to its publication.
- **Consideration of preceding study members.** This report follows on from a preceding study with members of River Otter Beaver Trial governance groups. Where the preceding study is discussed, only findings that are reported within the peer reviewed paper are presented. Whilst informed by the previous research, this report is a new project that gathered new data and presents new analyses, examining the *applicability* of those previous findings to other contexts. However, out of consideration and respect for the previous study's participants, the authors of this report notified the previous study's participants of the undertaking of this study by email on 3rd February 2022.

# 5. Findings

This section presents a full discussion of the results in relation to the relevant themes. This includes references to findings from the previous study which captured the experiences of the River Otter Beaver Trial (ROBT) Steering Groups. For ease of reading, where these are reported, they are referred to as factors identified by 'the ROBT Steering Groups'. For a full discussion of these findings and the supporting evidence, see the original peer-reviewed paper (Auster et al., 2022b).

Findings from the newly collected interview data is referred to as 'identified by the interview participants'.

## 5.1. Project governance

### *5.1.1. Project Objectives*

The ROBT Steering Group identified that a reintroduction trial requires clearly defined objectives, which take account of what may be feasible within a trial's scope and term. In the interviews, it was highlighted that the objectives of a BMG were tailored more specifically toward management, which differs to that of the ROBT; the ROBT was focused upon answering questions to ultimately inform national-level decision-making. A BMG meanwhile is more locally focused and influenced by national-level decision-making (see section 5.4.6). This was encapsulated by P2:

> *"[We had] to ensure the Trial was run in an appropriate way, and delivered, I guess, meaningful results that could inform national decisions. I think, to some extent, it's the other way round for the regular day-to-day working. Those groups have got to be informed by national decision-making." (P2)*

The objectives of the Tamar BMG that were referred to were the management of human-beaver interactions. But it was also highlighted that a BMG may also need to take actions to manage/maintain the health of the beaver population. For example, by ensuring the health of the beaver population's gene pool (see Campbell-Palmer et al., 2020).

### *5.1.2. Leadership*

The ROBT Steering Groups identified that a reintroduction trial requires committed leadership. Dedicated leadership in a reintroduction trial was reiterated by P4 who said that leading a reintroduction trial was *"not a 9-5 job"*:

> *"Doing it really conscientiously I think is really important." (P4)*

The ROBT Steering Groups also identified a need for leadership to be honest and transparent, with an open recognition that beaver reintroduction may entail both benefits and conflicts. This was linked with a likelihood of fostering trust among stakeholders and is applicable within the context of the Tamar BMG; participants highlighted that leadership should be open and pragmatic, and willing to discuss negative impacts as well as the positive. As an example, P4 reported that a willingness to engage with the concerns of one of the River Otter's main landowners was part of the reason why they felt the ROBT had been a success:

> *"[Estate] wanted to make sure that people could manage the conflicts [with beavers]. And they made that abundantly clear, right from the beginning. [...] But what maybe worked so well was that we totally bought into that idea [...] we really weren't looking at it from a conservation point of view, we were holistically considering it from a land management perspective. And I think that was one of, with hindsight probably, was one of the reasons it worked so well."*

Relating to the ROBT, some Steering Group members suggested that the governing groups should have had independent chairs. This was a suggestion to facilitate objective consideration of the evidence being gathered for government decision-making on the future of beavers in England, with a view that those leading a project may have vested interests. One interview participant referred to a risk that the Wildlife Trusts may be viewed as having a vested interest:

> *"When you're working for [...] any Wildlife Trust to be honest, [...] you are seen by some members of the public as 'you are pro-wildlife'."* (P3)

However, they went on to say they felt their personal experience of this response had been limited, and that it had been addressed to some extent by forming partnerships with significant landowners and academic researchers. Regarding the context of the Tamar BMG, no references were made towards a need for an independent chair. This may have been linked to the 'trial' element of the ROBT, which was required to gather science and evidence to inform decisions. However, it may not mean this view does not exist within BMG settings; it may more simply be that it was not highlighted as an issue. Regardless, what is clear is that, in both settings, a priority in the leadership will be to consider approaches that foster trust between parties, with the aim of enabling constructive discussion and shared decision-making on beaver management (Auster et al., 2021b; Decker et al., 2016):

> *"if you've got a thick skin and you keep the communications going and you're honest, open, transparent, you're not hiding stuff, you know, you win respect in the end."* (P1)

A newly identified element related to leadership was recognised through the BMG interviews; the experience that DWT were able to bring to the River Tamar, that they had

not had at the outset of the ROBT. In the case of the ROBT, DWT were undertaking a 'first' in England, which entailed a higher level of risks:

> *"at the time obviously this was a very bold decision for a Wildlife Trust to take. [...] And we had to take the decision to a) apply for the license, but more to the point, if we were going to go down this route, [...] we would have to raise the money, and there was absolutely no set guarantee we would get it at that point. We would have to take on all the liabilities if something went wrong, and there were no guarantees at that point. And we would have to deal with any negative PR, and of course at that stage, well we knew a bunch of people in the River Otter catchment were keen, but you don't know how the rest of the world was going to react until you start trying to get people around the table."* (P5)

By the time of initiation of the Tamar BMG however, circumstance had changed, and DWT had previous experience of leading on the ROBT that they could bring to the table. DWT participants felt this had been received positively by other BMG members:

> *"I would say it's given us a bit more credibility. Some of those relationships that we've built up have [...] worked quite well because of our role on the River Otter and so we come with obviously some knowledge of what beavers do."* (P4)

Indeed, this was highlighted as a factor which had encouraged one of the other leading organisations to contribute towards the BMG, for it had led to an increased sense of confidence in the venture:

> *"just knowing where it's come from, that it's come from on the ground experience and from such a thorough process as the River Otter Trial, [...] knowing that it's all from a tried-and-tested approach [...] does make me, yeah, just feel more relaxed about the whole thing and that we will get it right."* (P10)

This raises a consideration of the fact that BMGs may be taken on by leads with a lower level of experience in human-beaver coexistence. This appeared to have been recognised by interview participants, who saw knowledge-sharing and training as part of their leadership role, to help others that may find themselves in a similar position:

> *"we've developed skills in terms of how to enable people to coexist with [beavers]. We should be therefore looking to how we share that knowledge, skills, experience with a whole range of different other organizations. And that's the role we see us taking, you know, into the future. [...] we've got a really important role to play in the future and we should be supporting other groups to pop up and develop elsewhere."* (P1)

### *5.1.3. Structure*

The ROBT Steering Groups overall viewed the ROBT governance structure favourably, suggesting that it had enabled the Trial's objectives to be met, with good communication between groups. There was some comment however that the structure may have been more complicated than necessary, with effort duplicated between groups.

The governance structure is different for the Tamar BMG. In the first instance, it was highlighted that the governance structure was more intensive in the ROBT in reflection of the differing objectives; the ROBT was a trial of national significance that required a structure that would reflect that, whilst enabling research questions to be answerable. The Tamar BMG however is not a national-level project, and the objectives may not require as much focus on research (see section 5.3). Thus, it was highlighted that learning could be taken from the ROBT, but governance structures would not need to be as intensive for BMG settings.

The Tamar BMG is in an early stage of development, but already it is adapting. The present multi-level structure was influenced by the structure used in the ROBT, but at the time of writing, the structure is under discussion between the Delivery Partnership to explore whether it may be simplified further.

> *"I think we've made it too complicated. [...] I think the Beaver Management Group should be, the idea of these annual meetings of all of the stakeholders coming together and having the chance to input into the management is critical. That is probably the most important part of it. So I think I would see that forum as the Beaver Management Group, but I'm less convinced now that we need to have this Delivery Partnership meeting regularly because I don't actually think it's achieving as much now as maybe it did in the early stages, so I don't really think it's as necessary as a group. You still need a small executive of some description that do the people management, the budget management, the reporting to the funders. That's still a critical role, but it certainly doesn't need to be as big a group as we've currently got."* (P4)

There was further evidence among the interviews of longer-term strategic thinking regarding BMG structures in the event of beaver population expansion on regional or national scale (and these questions were also raised in relation to the remit of potential Localised Beaver Officers, should it be the case that they be implemented). Examples of questions raised are given in Table 3.

**Table 3. Questions raised by participants about potential future evolution of future management groups.**

| Question | Quotation |
|---|---|
| Should a BMG focus on a single catchment, or on should there be a regional level BMG? | *"We then need to think about, do we need something to cover the whole of Devon? Quite possibly, so we're looking at that. [...] so if in five years' time we have beavers, let's say, not only on the Tamar and the Otter, but also on the Dart, the Exe, and the Taw/Torridge, well that's five big rivers isn't it. That's probably the five biggest river systems that we've got. [...] we might need something that's rather bigger and looking strategically over a whole county, and then maybe some others which are perhaps more locally based."* (P5) |
| Will the need for BMGs reduce over time as people learn to live with beavers? | *"what does the future of those look like as it becomes more normal? And maybe, after a while, you don't need [BMGs] anymore because people know how to beaver- proof areas. Maybe they've got a fixed lifespan, those groups."* (P10) |

In Devon, DWT are actively considering adaptation of the BMG governance structure. At the March 2022 Tamar Delivery Partnership meeting, proposals were discussed about the potential for introducing a strategic, regional-level BMG with oversight of more localised BMGs. It was proposed that the regional group could involve key regional-level stakeholders and organisations that hold a statutory function, with oversight of the more localised BMGs with local stakeholder representation. At the time of writing, no firm decisions have been made.

Thus, structures are evolving rapidly, and adapting to changing circumstances with active consideration of the future. BMG objectives are different to the Trial; the BMG required additional input to initiate but may be simplified now it is running; and already thoughts are turning to potential future scenarios, including the potential that BMGs may be required to a lesser degree as people adapt to beaver presence. All of the following is in response to changing circumstances with an expanding beaver population, and the process of coexistence with beavers being renewed. (We return to this discussion in section 6).

### *5.1.4. Resourcing*

The ROBT Steering Group identified a need to consider resource requirements for a governance framework. The ROBT had a multi-level governance structure, and some individuals sat on more than one group. Whilst this was structure was viewed positively in regard to its ability to meet the project objectives, it was suggested that a more simplified approach would be a more efficient use of resources in the future. Within the Tamar, the interview participants had formed a governance structure that was influenced by that of the ROBT, although somewhat simplified in light of the different project objectives. Had the structure been more akin to that of the ROBT, this would have been resource-intensive:

> *"it's been vastly simplified because [...] it'd be a huge undertaking to do it as thoroughly as the River Otter, and the River Otter really was a pilot. So we can take a lot of the learning from that without needing to repeat it."* (P10)

As it is, the BMG is suggested to be resource-intensive to hold, particularly at the point of initiation:

> *"It's quite a significant commitment. And we've been lucky that we've had some funding to do it this year. It takes quite a lot of time because its all of the actions that come from these groups as well that you're then responsible for implementing."* (P4)

Time resource was also highlighted as a potential limiting factor, both for those governing the BMG and for those attending:

> *"it's easy to underestimate it [...] you have a certain number of meetings a year and you produce the paperwork for that which is a bit of time, and of course you do that, but actually the real work for someone like me was setting the thing up in the first place because you've got to go and have individual conversations with people and there's all that kind of, forming of the group stage as well."* (P5)

At the time of writing, the Tamar BMG forum has only had its first full meeting, and its second is scheduled for summer 2022. (There was intention to convene the group sooner, but progress was slowed by COVID-19 pandemic circumstances). P4 described this annual frequency as intentional as more frequent meetings would require time to organise, and risk being too onerous for those attending. The timing of this annual forum taking place in the summer was also intentional, as it was reported that most beaver conflicts and surveying happens during the winter months. A summer meeting would then allow the current status of the population based on the most recent surveys to be disseminated and discussed, alongside issues relating to any conflicts and their management from the previous season.

As an additional note, the ROBT Steering Group highlighted that trial governance by project leads would have to consider available resource for other financial risks involved in taking a leadership role; the ROBT license conditions meant that DWT would have been financially liable for any serious conflicts that arose within the trial. In the case of the

Tamar however, this liability does not rest with DWT. Resourcing for management does however remain a critical issue, as will be discussed in section 5.4.6.

## 5.2. Stakeholder engagement

### *5.2.1. Outreach*

The ROBT Steering Groups reported that the trial had engaged with a wide range of identified stakeholders, to provide opportunity for their interests to be represented. The interview participants who had been involved with the ROBT stated that the stakeholders on those groups were largely representative of interests on the national level, to reflect the national significance of the ROBT. Participants were invited by DWT to join this group, and P5 described the criteria through which these groups were identified:

> *"we really thought who was going to be likely to affected by this, and who are the people we need to take decisions?"* (P5)

Broad representation of different stakeholders was also highlighted as an intended feature of the Tamar BMG with an aim of bringing different groups together to learn from each other and prevent polarisation of views. The general make-up of interests for the initial meeting was similar to that of the ROBT Steering Groups, with representation from farming, fisheries, wildlife and water interests (although P9 believed there could be more representation of wider communities as beneficiaries of beaver impact, e.g. through flow attenuation and wildlife tourism effects [Auster et al., 2020, 2022a]). It was suggested that the response to beavers from these stakeholder groups would be likely to echo those from elsewhere:

> *"what linked all those stakeholders was that they had an interest, or had been impacted – positively or negatively – by beavers in the River Tamar, so a good definition of what a stakeholder is! [...] I think you could take any catchment in England, probably Wales and Scotland as well, and you'd have stakeholders with [...] potentially predictable views on beaver reintroductions. Sometimes you do get surprises, but on the whole [...] similarities with stakeholder opinion on beaver reintroduction I think."* (P3)

The stakeholder groups were defined as those that reside within the geographical catchment in reflection of the way beavers move through the landscape, rather than in response to any political or administrative boundaries.

> *"because of the way beavers use the landscape and colonise the landscape, it should be a catchment scale or catchment partnership scale. Not at a landscape scale, at a county scale. It should be based on geographical boundaries, rather than political boundaries."* (P4)

Despite similarities in the interest groups represented, there was some variation in the Tamar groups compare the ROBT however, to reflect the objectives of catchment-based beaver management. The differences in stakeholder representation on the group are reflective of features of the Tamar catchment, as summarised in Table 4. This is

demonstrative that user groups may vary in relation to characteristics of the catchment, which BMGs will need to be sensitive towards to appropriately address beaver issues on the ground (See Box 1).

**Table 4. Differences in stakeholder representation between ROBT and Tamar BMG contexts.**

| Difference between ROBT and Tamar BMG | Implication for BMG representation | Quotation from interviews |
|---|---|---|
| **Landownership pattern is different** | Multiple small-scale landowner representatives, rather than singular representatives of large estates. | *"Interest groups will be slightly different [...] obviously the landowners, the individual landowners. You don't have one big landowner like [in the Otter catchment], it's a slightly different landowner network there."* (P5) |
| **Tamar has a more significant salmonid fishery, with bigger populations of salmon and sea trout** | Increased need for interaction with salmonid fishery interests. | *"the Otter has got a much smaller population of migratory fish. It does have both salmon and sea trout, but not in any significant numbers, and hasn't been a significant fishery for either of those species for a very long time."* (P6) |
| **Most of the River Otter is entirely in one county, with a little at the top end in Somerset. The Tamar catchment is spread across Devon and Cornwall.** | Local authority or administrative representation may be more complex | *"It borders Devon and Cornwall which makes things slightly more complicated, but not massively, but of course the advantage of the Otter is it's all in Devon, apart from the very, very top which goes into Somerset."* (P5) |

The identification of stakeholders was described once again by P5 as focused on who would be most likely to be affected (positively or negatively), or on who would be requiredto take decisions within the catchment. The invitation *approach* however differed to that of the ROBT, due to the localised focus of the group and contextual background. Considerable emphasis was placed upon prior relationship-building ahead of invitation to the group. Whilst this had required more investment than sending out a single initial invitation, this was seen as worthwhile (particularly for building relationships with individuals who had concerns). It allowed the team chance to get to know group members, understand their interest in beavers, and build trust between parties.

> *"we had lots of private meetings with individuals, personal meetings, went and met people, and then invited them to the forum. I would say that was probably quite a good approach because you're building personal relationships with people and they hear a little bit about what's going on, and you get a chance to really hear what their input and their interest is in the beavers. And if they feel like they want to come along and be involved in a group then they can. And I think that worked really well."* (P4)

A further finding was evident from the interviews that had not been reported in the ROBT (perhaps because the ROBT had always been defined as a five-year project). This was that the membership of the BMG will need to be adaptive to changing circumstances related to beavers in the catchment. For example, new stakeholders may need to be invited to reflect how beaver impacts on the landscape may change over time (whether identified through ongoing monitoring or by stakeholders coming forward). It is also a possibility this could involve a reduction in stakeholders feeling a need to be represented, as they learn how to coexist with beaver.

> *"the beaver management group forum has to change from one year to the next, because the beaver population will be moving and the focus of issues will change from one year to the next. And so your membership of that beaver management group needs to be dynamic, and reflect the changes, you know, the constant changes of the population and where the focuses are in particular years and where the issues are arising that need to be discussed by that forum will change from year to year, depending upon what's happening on the ground in the catchment. So I would say that the idea of having a forum, a Beaver Management Group forum is a great one, but it needs to be a movable feast. It needs to have new people coming onto it all the time, and some people will drop off it as well. People will lose interest, the beavers will have settled down in their area, and people will have less involvement in it. So it wants to be a dynamic forum."* (P4)

**Box 1. Localised approaches to beaver management.**

In Cornwall, Yorkshire, and the Forest of Dean, there are licensed, fenced beaver projects upstream of communities that are historically at risk of flooding. These beaver projects were instigated (at least in part) to reduce the risk of downstream flooding. Recent research has shown flow attenuation impacts from beaver damming at all three sites (Puttock et al., 2020).

A recent study explored the perspectives on beavers and their potential role in natural flood management among community members living downstream of these beaver projects, using Q-Methodology (Auster et al., 2022a). A range of pro- and anti-beaver perspectives were identified, which exhibited a range of values. The study demonstrated that a 'community perspective' could not be assumed to be singular, as a range of values can be brought to the table. The authors suggest that a catchment-based approach to beaver management (similarly to approaches for other natural flood management methods) would facilitate opportunities to engage with these contextual perspectives and integrate them into management solutions.

(This study also explores the natural flood management implications of features identified within these perspectives).

### *5.2.2. Respectful, constructive discussion*

The ROBT Steering Group reported that discussion had been respectful and constructive, even where they held different opinions or did not agree on beaver reintroduction. There were sometimes tensions between groups that disagreed, but these were managed and led to a better understanding between stakeholders of differing backgrounds. There had only been one Tamar forum meeting held by the time of these interviews, but it was regularly cited that the intention was for the meetings to similarly be inclusive of different viewpoints, and for there to be an opportunity to share views and learn from each other.

The River Otter Beaver Trial demonstrated that the people who benefit from the activities of beaver may be different from those who incur costs (Brazier et al., 2020a, 2020b). This is clearly demonstrated in the case of beaver damming activity; there may be localised flooding on land behind a beaver dam, but the potential benefits from reduced flood risk are observed in communities downstream (Auster et al., 2022a; Puttock et el., 2020). This is exemplary of a need to consider both beneficiaries and negatively impacted parties in holistic beaver management approaches (Brazier et al., 2020b). Localised management would facilitate greater understanding of community views and interests at the local level, which could inform catchment-based approaches (Auster et al., 2022a). Thus, we suggest BMGs take a similarly holistic view, by enabling different voices to be heard and equitably

recognised. (Two examples of different local voices from the Tamar context are given in Boxes 2 and 3).

**Box 2. View on beavers from a Tamar fisheries representative.**

This individual has been working with fisheries in the Tamar catchment for over fifty years. They have seen signs of beaver activity across the catchment and reported an awareness of their presence on multiple tributaries. Whilst they reported that there could be potential benefits from beaver for biodiversity and flow attenuation, they primarily felt concern. Against a backdrop of declining salmonid populations nationwide, they perceived beaver dams as a structure that could impede upon migratory passage of salmonids and the availability of spawning gravels. They also held concern about the felling of trees leading to obstructed riverbank footpaths.

"*I discovered something not so long ago, they don't only obstruct upstream migration of fish, they obstruct the downstream migration. [...] the poor old salmon, they cannot afford this! We are already looking at a salmon population which is a very small fraction of what it was fifty years ago. Their numbers have declined massively. So any impoundment that impedes either upstream migration and or the downstream migration, and proliferates predation, it allows predators to feed better, easier and in groups, is going to impact our ever-declining salmon population*." (P6)

"*all the impounded water will of course drown out all your riffle sections, so you're not just losing the ability of fish to get over because the dams will block it, but you're losing the spawning ground and the juvenile habitat areas."* (P6)

(Alternative perspectives of the angling community from the River Otter catchment are reported in Auster et al., 2021a, and a literature review of beaver-fish interactions can be found in Kemp et al., 2012).

**Box 3. View on beavers from a Tamar landowner couple.**

These landowners first identified beaver activity on their land in 2014. They have been excited by the presence of beavers and are aware of beaver activity elsewhere in the catchment. Whilst these landowners reported that the beavers' presence had positively impacted upon their previous hotel business (with returning guests coming to see the beavers), they were primarily motivated by what they viewed as benefits for wildlife in the area and a passion for sharing this with other people.

*"They arrived here, we embraced them, and we've promoted them. Because there's nothing negative about them as far as we're concerned."* (P8)

*"there were hundreds of thousands of damselflies down there, they were breeding down there, it was amazing."* (P7)

*"suddenly we had the attraction of the beavers, and the tourism was fantastic. People were booking in here to see the beavers, and of course taking photos and staying by the ponds. And so it was a great money-maker for us."* (P7)

*"It's an opportunity to do documentaries and to educate [...] about how poor our wildlife is and how this can help turn the tide. How it can help to reintroduce the bugs that are dying out, to encourage different bird species to thrive."* (P8)

(For more on beaver impacts on biodiversity, see Law et al., 2019; Nummi et al., 2019; and Stringer & Gaywood, 2016).

### *5.2.3. Challenges*

The ROBT Steering Groups reported a series of challenges associated with stakeholder engagement. Challenges were similarly reported from the Tamar interviews. Table 5 details these described challenges, with example quotes. (Quotes provided are from Tamar interviews only. Evidence from the ROBT Steering Groups is presented in Auster et al., 2020b).

**Table 5. Reported challenges in stakeholder engagement.**

| Challenge | | Description of the challenge | Example quotes |
|---|---|---|---|
| ROBT | Tamar BMG | | |
| Participation from stakeholders | | Some stakeholders may not engage despite attempts at outreach | *"We had about, I would say about seven or eight representatives of the angling community who we'd spoken to, and I went out and met a few of them as well, prior to the forum. [...] We had one or two that turned up, but we certainly didn't have as many of the fishermen present as we liked [...], which was a bit disappointing.* (P4) |
| Risk of partnership breakdown | *Not referenced by participants* | Risk of unresolvable conflict.<br><br>(No breakdown was reported in the ROBT) | See Auster et al., 2020b |
| Reputational risk | *Not referenced by participants* | Risk that engaging would influence perceptions of the stakeholder. | See Auster et al., 2020b |
| Potential use of stakeholder resources | | Risk that participation requires a high level of their resource, possibly leading to difficulty in retaining engagement | *"if you ask people to come more often than [once a year], then it's too onerous for people and then they're less likely to come to the meeting when you need them to come. [...] people are really busy and it's hard to get people to leave the farm,* |

| | | | |
|---|---|---|---|
| | | | *or to leave the river, and come and sit in a room and talk about beavers for a day."* (P4) |
| *Not referenced by participants.* | Large number of stakeholders to represent | BMGs need to be inclusive and open, but there are many interests to represent, which could involve many people. Key is to find correct balance. | *"there is a real challenge in the future in that it can be massive, you know, there's an awful lot of people and there's an awful lot of sectors in that landscape that you need to represent"* (P1) |
| *Not referenced by participants.* | Relationships with other groups, partnerships, or other BMGs | Unsure of BMG relationship with other partnerships, e.g., catchment partnerships or future BMGs. | *"I mentioned about catchment partnerships and there's obviously other things like Local Nature Partnerships, and the like. And I think obviously a proliferation of groups can cause difficulties for organisations to engage [...] Clearly there's going to be some crossover [with catchment partnerships], I think there is a need to maintain some separation between them because [...] they are not absolutely aligned.* (P2) |

### *5.2.4. Value of participation for stakeholders*

The ROBT Steering Groups reported they had felt their participation to have been of value, with all participants indicating they would be willing to participate in future trials (although

one participant said this would be conditional on the trial criteria being objective). Reasons they felt participation to have been of value included: strengthened relationships with other stakeholders; having had opportunity to learn about beavers and their ecology; being better informed to adapt the own operations; and having had opportunity to participate in discussion.

On the Tamar there has only been one BMG meeting so far, meaning it is perhaps too soon to draw conclusions on whether stakeholders felt their participation has been of value. This said, the project leads indicated were pleased to have now initiated the group, through which they had been able to start sharing knowledge from their prior experience and to discuss the status of beaves on the Tamar.

> *"It was good for us to be able to give people the overall picture of beavers on the Tamar, as we understand it. It was good to be able to introduce beaver management and talk about some of the issues that we'd had over the River Otter."* (P3)

## 5.3. Research and Monitoring Programme

### *5.3.1. Broad Reception*

The ROBT Steering Group stakeholders viewed the research and monitoring programme for the trial positively, with many participants citing this or the resulting Science & Evidence report (Brazier et al., 2020a) as a key trial success (P1 also referred to this explicitly in their interview for this project). Where this was the case, this was viewed to have provided an evidence-base for decision-making, but it also highlighted areas that could require further research.

As the Tamar BMG has just been initiated and the approaches to monitoring are being discussed, it is too soon to draw conclusions on the reception to any research and monitoring programme that may in future be associated with the group. However, it is worth noting that P7 & P8, who have had beavers on their land since 2014, strongly felt that there had been a missed opportunity to study the impacts of those wild-living beavers in what is now a very impacted landscape. Until the BMG had formed, there was an absence of any body or organisation holding a remit for monitoring beavers on the Tamar. Whilst research was undertaken where this remit existed elsewhere, less effort was made to study beavers in the Tamar. In this case, the landowners attempted to engage with groups that were monitoring or researching beavers elsewhere, but they felt overlooked rather than involved.

> *"considering what we've got here as far as the beavers are concerned, which you know, it's been said it's one of the most impacted valleys in England, as far as the beavers, they are unfenced. It's all been under-studied. [...] I think that there's been a terrible waste of a study here."* (P7)

### *5.3.2. Programme focus*

The ROBT Steering Group stakeholders identified that the research programme for the trial had been co-created with stakeholders, with intention for it to give a holistic understanding of reintroduction beyond any singular interests of participating members. In the new interview data, the participants who had been involved in the ROBT highlighted that it had had an intensive research programme to address the nationally significant objectives. However, they felt that research efforts (if any) could be less intensive for localised BMGs, where the emphasis is on management support. This does not mean to say they suggested there is no longer a case for further research. On the contrary, participants highlighted that research could continue into certain areas where questions remained. There is provision for research working groups in the Tamar BMG Terms of Reference. As beavers become more widespread however, it may be that any research efforts could be coordinated between BMGs:

> *"I think there's going to be a real need to coordinate research, and evaluation, and understanding around both the effectiveness of beaver management groups but also the impacts of beavers. Obviously, that's been really well done through the Beaver Management Group or the work done by Exeter University on various other projects, but I think there's going to have to be some sort of thought to how that progresses going forwards"* (P2)

In the context of the Tamar a relevant outstanding research question may be related to the relationship between beavers and salmonids, in particular salmon. ROBT Steering Group stakeholders highlighted this as an area in which some questions remained, and this is particularly relevant to the Tamar which has a more significant salmonid fishery. Diverse perspectives exist about the impacts of beavers on fish populations in the fisheries sector, and continued research into beaver-fish relationships will require open, cross-sectoral discussion (Auster et al., 2021a; Kemp et al., 2012; Needham et al., 2021). Such cross-sectoral dialogue is arguably an opportunity arising from BMG; the Tamar BMG Terms of Reference account for the potential for forming smaller working groups with input from stakeholders and academics to investigate outstanding research questions.

> *"I really wouldn't underplay the importance of bringing stakeholders along with us, and making sure that we understand the concerns of salmon fisheries, the various different syndicates and groups that will be, that will have worked very hard within the Tamar catchment to desperately try and maintain levels of salmon, because it is a species in itself that has suffered massive declines. [...] So we have a lot in common with those groups because we both want the best for the environment to be honest, and to create healthy aquatic ecosystems. But yes, some of the opinions within those groups are quite anti-beaver, so I think maintaining academic links in catchments where you have questions about the impact of beavers is vital."* (P3)

### *5.3.3. Feasibility limitations*

The ROBT Steering Group stakeholders highlighted several feasibility limitations for trial monitoring and research programmes. This includes practical limitations (e.g., if there are limited impacts available to study), temporal limitations (e.g., capacity to address questions within the project timeframe), and limitations of financial resource (e.g., conducting desired level or intensity of research within the available budget). Financial resource limitations were reinforced in the interviews, with participants stating that it would be unrealistic to be able to invest in a similar level of research and monitoring for smaller scale BMGs.

> *"So the River Otter Trial, [...] with all my time, with the organisation's time etc, you're probably looking at a three quarter of a million pound project over the five year period, give or take. And it would be unrealistic and I also think it would set quite a troubling precedent to say 'you go and do that everywhere else'. The point is it was a trial. You invest in a trial and when you go to new landscape areas you learn from that and you don't need to replicate a lot of it."* (P1)

### *5.3.4. Objectivity*

A question was raised by a participant in the ROBT Steering Groups about the level of objectivity in the research and monitoring programme, with a perception that there was bias toward beaver monitoring. Another of the participants, a researcher, reported that they felt they had on occasion been questioned on their objectivity, and so they had sought to address this by seeking peer review of the evidence they had collected. No references to objectivity in a research programme were made in the Tamar interviews, but it is worth continuing to consider how best to maintain trust with a BMG's membership in any future research studies, to reduce potential for future contestation of scientific assessments.

## 5.4. Strategy to manage arising conflicts.

### *5.4.1. Need to manage conflicts*

The ROBT Steering Groups stressed the need for a strategy to manage arising conflicts, to support those negatively affected and prevent conflicts from escalating. This should account both for the effectiveness of management approaches, alongside an understanding of the social acceptability of management techniques (Auster et al., 2019; Campbell-Palmer et al., 2016).

In the ROBT, DWT took upon themselves the management of beaver conflicts, in accordance with the license criteria. During the Trial, a proposed framework for the management of beavers post-trial (should they be allowed to remain) was drawn up in a collaborative approach, and approved by the trial Steering Group (Brazier et al., 2020a; River Otter Beaver Trial, 2019).

The need for a management strategy was similarly stressed by the interview participants for this study. It was reported conflicts could escalate if there was a lack of management support. This has been previously observed where a beaver population arose in Tayside (Scotland). At first, there was no body responsible for beaver management (until the decision to formally recognise them as a native species in 2019), and conflicts escalated (Coz & Young, 2020). Access to management support is likely to reduce conflict potential, both between humans and beavers, and between humans about beavers (Auster et al., 2021b; Campbell-Palmer et al., 2016) (see Box 4).

> *"non-intervention is not an option. If you go down that road you will get polarization [...] That's where you just don't want to be, and it's silly little things that can just get magnified and they cause people not to talk to each other. And you get that human friction, and you can't get stuff done. Simple, simple stuff"* (P1)

Further, P3 described their experiences as a Field Officer for the ROBT. This role took responsibility for much of the beaver management on the ground. They indicated that they had invested time to demonstrate that management could be undertaken during the Trial period, and they were now seeking to share this expertise with landowners so that they could be empowered to sustainably manage impacts themselves. Whilst they had reported that these landowners had an initial frustration at the fact they had to undertake management in the first place (which is something they had not had to do prior to the reintroduction of beavers), they were reported to have later relaxed and adapted to the situation, as they learned to live alongside beaver.

> *"it's a bit of a cheesy way of saying it, but some landowners have gone on a journey [...] One point is perhaps a frustration that they have to do the work because beavers have been reintroduced, so that's a point that must be made in that they didn't need to do that work before there were beavers in the catchment. But, yeah, then there's a great sense of relief if, in my opinion, the farmers that I work with*

*have been relieved to hear that Natural England have been thinking about the licensing in a very pragmatic way so that, if it's a new beaver dam then, whip it out. If it's obviously a fresh beaver dam, if it's not providing refuge, as in deep water for a beaver lodge then let's be sensible about that and allow farmers to do that. [...] I really hope that the licensing will be totally sensible. And if it is reasonable, which it sounds like it will be, then that will provide confidence to landowners."* (P3)

At this juncture, it is important to note that there will be some individuals who may be unable to undertake management interventions themselves either now or in the future. Additional support may be required to help those individuals:

*"when you're dealing with perhaps vulnerable or elderly people who aren't able to manage beaver impacts, so they've got arthritis or they just aren't keen on jumping in a river, then obviously the amount that they can do is limited."* (P3)

**Box 4. A need for management support.**

A recent study reports on results from a psychological 'mental modelling' exercise undertaken with stakeholders in the River Otter catchment, during the timeframe of the River Otter Beaver Trial (Blewett et al., 2021). Participants included members of the general public, conservation and environmental scientists, landowners and managers, farmers, and anglers.

Results showed there was greatest potential for the perspectives of farming participants to diverge from those of the other members, with higher levels of perceived risk associated with beavers. However, the models also demonstrated that both NGO leadership and monitoring and mitigation actions alongside farmer engagement were likely to reduce this potential for divergence and increase the likelihood of beaver acceptance.

### *5.4.2. When to intervene*

The ROBT Steering Groups identified proactive management (pre-emptive intervention) to be more likely to reduce conflict potential. Where this was not possible, a rapid response was said to be vital. In a separate study (Auster et al., 2021b), this was similarly reported by individuals who had experienced conflicts with beavers during the ROBT, in a series of interviews about their experiences (see Box 5).

This was reported to also be true within the context of the Tamar. As the BMG has only just been formulated, management has so far been reactive. Few conflicts have so far been reported, but until the BMG was initiated, there has been no designated contact point for beaver management. In the absence of available support, multiple participants

suggested some private individuals may have taken management into their own hands, potentially involving the killing of beavers. Beyond the direct conflicts with beavers, these actions may lead to conflicts between local people. In these interviews, one participant indicated they had already disagreed with another landowner about approaches to management of beavers on their land.

> *"he told us that he had a problem, he had beavers on his land. And [we] said 'do you have a problem with them?' and he said, 'not anymore'. So, it was evident that he was shooting them. [...] I said to [them], why don't you come down, we'll walk you through the valley, we'll show you exactly what these beavers have done since they've been on the land [...] They won't harm what you've got'. We never heard from them, but this sort of mentality, if the beavers spread and people like that aren't educated or turned, then we could have a situation similar to the situation on the Tay."* (P8)

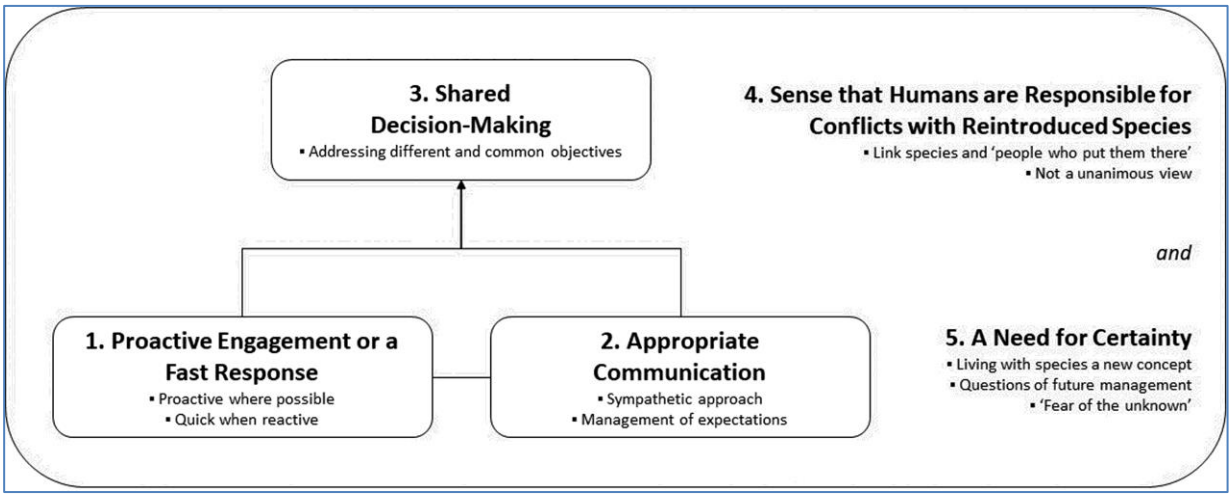
However, now that it has been formed, it was reported as an explicit intention of the Tamar BMG to be able to proactively intervene and reduce or prevent potential future conflicts.

> *"we're working and getting it together, and the forum together, and the conversations and the larger communication open, before there's trouble. Which I think is a really smart way of doing things."* (P9)

**Box 5. Engaging with individuals who report conflicts.**

The experiences of individuals who reported conflicts with beavers during the River Otter Beaver Trial were captured in a series of interviews (Auster et al., 2021b). From these interviews, five themes were identified that related to the engagement these individuals had received from wildlife managers. Three of these were themes that could be directly applied in practice by wildlife managers, and two were underlying themes that influenced the individuals' expectations of a management response. A summary of the themes is given in Figure 5, which if addressed together may lead to 'better' engagement by wildlife managers when beaver conflicts are reported. (A full discussion of these themes is available in the original paper).

**Figure 5. Summary of themes related to engaging with individuals who report conflicts with beavers (source: Auster et al., 2021b. Reproduced under Creative Commons (CC BY 4.0)).**



### 5.4.3. Clear communication

The ROBT Steering Groups highlighted a need for clear communication of a management plan, to provide clarity on available management options. Similarly, individuals who reported conflicts within the ROBT highlighted that an approach that was sympathetic to their concerns was more likely to be received favourably (see Box 5). Clear communication was also raised in the Tamar interviews, with support for communications that appropriately manage expectations of beaver impacts, and provides pragmatic advice:

> *"it's really important to talk about the practicalities of reintroducing beavers because they can have negative impacts and I think talking about that up front, and finding time to build relationships with people and individuals on those beaver management group is really essential"* (P3)

> *"Having really high-quality advice solves the vast majority of the problems."* (P1)

Included within this was the matter of a clear contact point for individuals with concerns to be able to easily access management support. In the ROBT, there was a dedicated Field Officer, who could be reached through DWT or through a dedicated email Inbox. (The interview participants highlighted this as a potential role for Local Beaver Officers, should they be a feature of future approaches to beaver management).

> *"our learning from the River Otter Beaver Trial and now our ongoing management there is that having a field officer [...] on the ground is a really critical part of both managing any negative impacts and potential impacts, and sort of nipping them in the bud, pre-emptively minimising them, mitigating them, so reducing risk. But also alleviating concern, being able to engage with communities proactively, so we can go out and talk to communities".* (P2)

### 5.4.4. Long-term thinking

The ROBT Steering Group stakeholders highlighted that management strategies should be underpinned by long-term thinking, to anticipate future challenges and address them early (Auster et al., 2019). Some factors are national-scale decisions that may be outside of the remit of an organisation (e.g., legal protective status of beavers), but it is possible for stakeholders to collaborate and provide informed recommendations – as demonstrated by the Beaver Management Strategy Framework Document arising from the ROBT (River Otter Beaver Trial, 2019).

In the Tamar context, the management strategy is in early stages of development. Similarly to the approach that was used in the ROBT, discussions on a Tamar management strategy have begun by seeking agreement over a 'Management Statement'. Here this was informed by the ROBT strategy document, so was framed around the

hierarchy of actions (i.e., education first, then risk avoidance, mitigation, translocation, and finally lethal control).

> *"what we needed to start off with really was what we did with the Management Strategy Framework on the Otter, which was like a statement of common ground. If you've got a bunch of people which are all coming at things with different world views and different thoughts about Beavers, then talk about the stuff you can agree on [...] And so that's what we did, and that's what we did on the River Otter. [...] [It was informed by the Beaver Management Strategy framework and that will evolve into a management strategy for them in that area."* (P1)

As a part of this, there is an intention to empower individuals by sharing knowledge on how to manage beaver impacts. P3, a Field Officer, described how they had sought to demonstrate that beavers could be managed during the trial phase, and they were now seeking to empower landowners to take management actions on themselves as they learn to live alongside beaver.

> *"I think during the trial, as somebody that's meant to be managing the impact of beavers, I was very keen to demonstrate that I could manage the impact of beavers. I wanted to demonstrate that, for number one I was capable of doing that, and that Devon Wildlife Trust was capable of managing this reintroduced species [...] That was quite resource heavy, and it still is. So in the long term [we] will have to encourage landowners to manage beavers more sustainably, as in, some of the beaver management will take place by landowners and farmers, rather than a beaver officer. And that can take place under perhaps class licenses."* (P3)

As P3 highlighted, it is a possibility that resources for beaver management may reduce over time as knowledge is shared and the presence of beavers becomes normalised. Thus, initial resource could be seen as an investment in future human-beaver interactions. If this holds true this would be beneficial, as once again time and financial resources were identified as limitations on beaver management. In fact, the Tamar had not yet been surveyed in detail for there was not enough available resource (the Tamar catchment is over 7x larger than that of the River Otter):

> *"We've been talking about the survey work for some time. It takes about twelve days' worth of work [in the Otter catchment] and this year that's not possible."* (P3)

The changing national context will influence the management strategy of any organisation or BMG (see section 5.4.6.). In light of this, the development of a management strategy for the Tamar has been paused whilst the group awaits direction from Natural England, DEFRA and UK Government.

### *5.4.5. Contextual conflicts*

Broadly, interview participants highlighted that management issues were likely to be similar between the catchments of the River Otter and the River Tamar. This was primarily because beaver behaviours remain the same, and participants felt there were similar geographical characteristics between the two catchments. Even so, several factors were identified by participants that were catchment-specific (which led to the identification of this as a new subtheme which was not present in the prior study). The features identified as Tamar-specific are outlined in Table 6. Such elements will need to be considered within localised management approaches (Auster et al., 2022a):

> *"I'm all for practicality and place-based, risk-based solutions, rather than hav[ing] a textbook for the way things have got to be done."* (P9)

**Table 6. Contextual features that influence beaver management within the Tamar catchment.**

| Feature | Tamar Context | Implications | Example Quotes |
|---|---|---|---|
| **Availability of access** | There is less availability of public access in the Tamar than the Otter. | -Issues may be less visible, meaning they are less easy to proactively identify<br><br>-There may be fewer access points for survey-work<br><br>-Individuals may undertake their own management actions without people knowing | *"There is much less access, public access on the Tamar. [...] So on the River Otter we've got public footpaths all over the place, [...] whatever's going on, it's in the public eye, whereas the Tamar is a private river. It's a much more agricultural landscape [...] and there is very little public access. Which means that things go on there, under the radar, without anybody knowing anything about them."* (P4) |
| **Catchment size** | Tamar is over 7x larger than the Otter | - Surveys would be more resource-intensive<br><br>- More time would be needed to travel between sites | *"I have been sometimes very busy managing the impacts of beavers in the River Otter. That's really, that's quite a small catchment, so stepping up to a catchment which is larger, so it takes* |

| | | | |
|---|---|---|---|
| | | - Currently, beavers are more dispersed so there are fewer known conflicts than in the Otter catchment<br>- There may be a potential for more beavers throughout the catchment, and so potentially a higher number of impacts in future<br>- More time would be needed for proactive engagement with more communities | *longer to travel between sites, and you might have more beavers, that's a difference of future beaver management as well."* (P3) |
| **Significance of salmonid fishery** | More significant fishery on the Tamar than on the Otter, particularly for salmon | - Greater potential for interaction with salmonid fishery interests | *"I think that the Tamar will be a slightly more significant, more significant impact perhaps on fisheries and salmon fishing [...] you have got syndicates fishing on the River Otter as you know, but that is primarily for sea trout and brown trout, not for salmon, and I think the salmon point of it might be very interesting ecologically, to understand more."* (P3) |
| **Different stakeholder interests** | Tamar includes upland and commons interests | - New and different set of actors with whom to engage | *"It takes in a large area of upland on Dartmoor, so you've got different stakeholders and commoning interests and different land ownership patterns"* (P1) |

| | | | |
|---|---|---|---|
| **Urban infrastructure** | Tamar catchment includes the City of Plymouth | - Proactive consideration of beaver interactions with urban infrastructure (no conflicts yet observed). | *"Plymouth is obviously at the bottom of the catchment and has, sort of, quite a few reservoirs and things of that sort, so that big sort of infrastructure in it [...] I think that some interaction between Beaver Management Groups and them feeding into local plans is going to be really critical. We see a lot of development and infrastructure on floodplains, by rivers, and I think if we want to make space for water, make space for beavers, then yes that can be through things like ELMS and through land management – that will be critical – but equally critical is ensuring the planning process takes that into account."* (P2) |
| **Geographical barriers to beaver dispersal** | Tamar has fewer barriers for beaver dispersal into adjacent catchments, compared to the River Otter | Higher level of proactive preparation required for beaver management in adjacent catchments | *"the Tamar goes up onto Dartmoor and Bodmin Moor, and therefore the ability of the animals to move from that catchment into neighbouring catchments is potentially greater because [...] where you've got wetland upland systems obviously any aquatic animal could move through that much more easily, whereas the Otter tends to be restricted more in where it meets other catchments because of ridge roads, and things like that."* (P2) |

### *5.4.6. Influence of national context*

Since the time of the ROBT, the national context has evolved: UK Government declared that the River Otter beavers could remain; DEFRA announced that they are minded to legally protect beavers; and DEFRA have held a consultation on national approaches to beaver reintroduction and management. A number of factors related to the Tamar BMG were identified by interview participants as having been influenced by changing national circumstances (leading to the identification of this new subtheme).

It was reported that indicating a decision that beavers will remain had enabled a freedom to discuss beavers and to invest in the Tamar BMG, but there was an ongoing sense of uncertainty about the future of beaver reintroduction. In a separate study (Auster et al., 2020b; see Box 5), individuals who reported conflicts with beaver in the ROBT exhibited a sense of uncertainty related to the future of beaver management, which led to worry about whether they would be able to manage beavers after the trial ended. This was similarly referenced here by the interview participants; a particular uncertainty related to whether funding would be available to support beaver management:

> *"we're not going to be able to fund all of this externally forever. And funders [...] aren't going to fund us in every county. So, there is a resourcing implication here. [...] at the beginning of this, going back six/seven years we were in a position to throw our core resources at [the ROBT] and just put someone onto it full-time. We wouldn't have been able to do that for five years non-stop, particularly as it grew. We would have had to pull out if we hadn't got external funds. And I think, when DEFRA considers what is required for new releases, it's going to have to be realistic about what funds people are going to be able to raise, and it is very difficult. [...] There was absolutely no point where we had guaranteed funding for five years, let alone ten."* (P5)

Availability of funding resource is a critical consideration for the governance of BMGs and the implementation of management strategies. This report has highlighted that BMGs require both time and financial resource to function (section 5.1.4), and that resources may influence or limit beaver management (section 5.4.4) and research (section 5.3.3). National policy decisions will likely influence the expectations of who will be responsible for resourcing and the availability of funding options.

A second uncertainty regarded the implications of legal protective status the ability to manage beaver impacts:

> *"We're in this limbo period at the moment where beavers haven't got legal protection, but the threat of legal protection and the risk, as far as the landowners are concerned, the risk of them becoming a protected species is one of the reasons why people are probably killing beavers, ironically. Most of the landowners that we dealt with on the River Otter are really quite relaxed about beavers, but what they didn't want is another protected species on their land, and so that's the biggest*

*challenge. Legal protection is a double-edged sword and it really can be counter-productive."* (P4)

There was also a perception of disconnect between the knowledge of national agencies and the knowledge of those who have hands-on beaver experience.

> *"You know, there are potentially poorly informed decisions which are coming down from government. [...] So a good example is with state vets that would say "well, if you're going to move a Beaver from X to Y, if it's in a TB hotspot, you're gonna have to check it for TB". OK, well how do you do that? And even state vets are like "just take a urine sample". Well, they don't have that type of genitalia. [...]. And the TB is a great example where you know there's been no cases as far, as we're aware, of Beavers suffering from TB, so there's your first key issue. Then actually testing them is a nightmare. [...] I think, at the moment there's a lack of join up and understanding, but that will come."* (P1)

Thus, a mechanism will be required for two-way dialogue, so that not only can central authorities communicate decisions, but those with on-the-ground expertise can share knowledge with national bodies to inform those decisions. In the future sense, an integration of expertise was suggested as a potential part of the role of Local Beaver Officers (should it be that officers are included in the future approach to beaver reintroduction in England):

> *"having an officer representing statutory bodies dedicated to an area I think is key because there's a lot of stuff we've got to learn and there's a lot of implications associated with all the decisions which will be made. And having someone that's embedded [with a statutory agency], that we have continuity of knowledge and support, is really important. Otherwise, tricks will be missed and friction will be unnecessarily created."* (P1)

The suggestion of a Local Beaver Officer is interesting. These are one potential approach to beaver management in future and were referred to within the DEFRA consultation, in which it was suggested that funding officers may be a requirement of future beaver release licenses. The principle of a beaver officer was positively received among interviewees as they felt they would be an appropriate contact point, who would understand the local context and be able to engage with the local people.

> *"I think that's a good idea. Somebody within the area that can liaise with the locals, who knows what they're talking about."* (P7)

However, there was concern that a requirement for BMGs to fund an officer using limited resources could be a stumbling block to providing effective beaver management, or even to a beaver project proceeding in the first place.

> *“If that’s going to be too difficult to resource, funders might not want to pay for that, is that something that would be a stumbling block for getting these things off the ground?”* (P10)

Interviewees suggested that, if they are to be employed, there could be a more efficient approach to the employment of beaver officers, by considering the scale of remit assigned to each officer; it may be that one is required for a larger catchment, but in other settings one may be enough to oversee multiple small catchments. (This is similar to questions about the potential remit of future BMGs).

> *“I think we definitely do need that experience locally on the ground, and [resource] dedicated to that role would be great because we’re sort of begging and borrowing staff time here. I suppose what’s not clear is how many will we need? [...] it’s not yet clear in my mind what they will look like yet, how they will be funded.”* (P2)

## 5.5. Public engagement

### *5.5.1. Importance of public engagement*

The ROBT Steering Groups identified public engagement as a critical component of a reintroduction trial. This was cited as beneficial to address misinformation and raise public awareness, as well as to build public support. P4 explained one of their approaches to 'busting myths' around beaver reintroduction, whereby they include a slide at the start of any talk to address common misconceptions. They felt this had often relaxed people who held concerns based around these understandings:

> *"education, myth-busting, that's really helpful because it will provide them with confidence about what beavers do and don't do, and then again provid[e] them with the knowledge of how we step in to manage beaver impacts"* (P3)

In the Tamar catchment, DWT are now taking upon themselves a role for sharing the knowledge and experience they have gained from the ROBT, with emphasis on the ways in which beaver activities can be managed (as referred to in section 5.1.2).

> *"We've just run a series of training sessions [...] they've been full day events and it's been about talking about the Tamar population, the status of the population. The sort-of national context, the legal context about the consultation. And then a lot more about beaver ecology and management, impacts on the environment, ways that you manage conflicts. We talk about the management hierarchy and introduce that, and then take people on a step-by-step approach through that, do all the different issues, and then we've taken people out onto sites [...] we should do more of them, and I'm sure, as the population expands and it becomes more widely known about and it starts to come into conflict with people a bit more, there'll probably be more scope for those."* (P4)

Engagement was viewed as important in the Tamar context, but the approach to wider public engagement beyond the BMG has differed from that of the ROBT, for a lower key approach has been employed (see section 5.5.2). The landowners who were interviewed were however passionate about a need for education related to the potential benefits of beaver activities at a time of biodiversity crisis.

> *"it's an opportunity to do documentaries and to educate the ignorant public, maybe more widely, about how poor our wildlife is and how this can help turn the tide. Because [...] we need to hit the brakes, put into reverse, and recapture a lot of the stuff that has been destroyed over the years if we can, before the decline accelerates."* (P8)

### *5.5.2. Reach and tone*

The River Otter Beaver Trial had an extensive public engagement programme. It was a national-scale project, with lots of public attention. Thus, there was high investment in objective, evidence-based public engagement in reflection of this, which in turn drew a high level of response.

> *"On the River Otter, we pushed that very hard. We had reasons for doing so and we probably got more, no not probably,* without doubt *got more media hits work through our work on the River Otter beavers than anything else we've ever done, by a very considerable margin. It has been hugely successful."* (P5)

Now the trial is over, and the presence of beavers on the River Otter is somewhat normalised, the level of resource allocated to public engagement has been scaled back.

In the River Tamar, a different approach to public engagement has been taken. Over the years, DWT have held many meetings at their enclosed beaver project, but it was reported that engagement in relation to the free-living population has been much lower key; whilst it was "*not a secret*" (P5), less investment had been put toward engagement. This was reported to have been due to a multitude of factors, such as: uncertainty surrounding the status of beavers on the River Tamar; less public access in the River Tamar catchment reducing the potential for guided walks; a suggestion that some landowners may have 'kept quiet' if beavers were on their land to either prevent the beavers being taken away, to be able to undertake their own management actions, or to prevent trespass from 'beaver-watchers'; there was a suggestion that publicity may risk annoying people who were more apprehensive about the situation. It was also referenced that the presence of beavers in Devon was not as newsworthy as it once was before/during the ROBT, which could indicate that beavers in the region may be in the process being normalised for people as an animal that resides within the landscape:

> *"the story of beavers being in Devon is not a new one now. The fact that the Wildlife Trusts are playing a key role in beavers is already well known."* (P5)

Prior to the formation of the BMG, the landowners who were interviewed had actively undertaken some of their own public engagement activity. They had formerly run a hotel as part of their business and they reported that guests who may not have come to see the beavers returned in order to do so. In response to the demand, they had run guided walks.

> *"the thing was people didn't come here initially to see the beavers, but when the beavers arrived, a lot of these were repeat customers. And we introduced them, and then they came back for them. There wasn't a single customer who left here and said 'these are not good, these are not good for the environment', because they could see what they were doing, and they could see, if they visited from one year to the next, how the valley was evolving, with you know, the wildlife etc."* (P8)

This is indicative of a potential for beaver tourism and education where individuals are willing to invest in the opportunity. Whilst this was a feature not raised by the ROBT Steering Groups in the previous study directly, it was identified in the evidence gathered for the ROBT (Brazier et al., 2020a) (see Box 6).

**Box 6. Beaver tourism in the River Otter Beaver Trial.**

A mixed methods case study used footpath counter data, interviews with businesses, and a community mail-return survey to explore how benefits of beaver tourism arose in the village of Otterton, during the River Otter Beaver Trial (Auster et al, 2020).

A pair of beavers established a lodge in an accessible location, viewable from a riverside footpath. An increase in footfall was observed, which local businesses reported had led to an increase in custom. Investment in beaver-related initiatives (e.g., beaver-related events and merchandise) increased the scale of this benefit. Further research is recommended into if and how these benefits may change over time as beavers become more widespread.

Beaver tourism was reported to interact with other issues within the local community (e.g., availability of car parking), but positive emotions were also reported by residents in response to seeing beavers or signs of their activity.

## 5.6. Broad perspectives on reintroduction trials

### *5.6.1. ROBT as a model*

Generally, the ROBT framework was viewed favourably by the ROBT Steering Group and it was suggested as a potential model for future reintroduction trials to follow. As was discussed above however, this framework may be too resource-intensive and complicated to follow within the context of BMGs (see section 5.1.3).

However, there is a similarity between the ways in which the ROBT and the Tamar BMG have come about. The ROBT was set up in response to the appearance of beavers on the River Otter, which had come from an unknown source (Crowley et al., 2017). This was reported by some of the ROBT Steering Group members to have been a source of tension among certain groups. This is similar within the context of the Tamar, where these beavers too had appeared on the river, with the population source unknown. This was a real point of frustration for P6, who felt there had not been chance for a conversation on whether beavers should be reintroduced in the first place:

> *"The thing that slightly gets up my nose here is that [...] the main topic of discussion was nothing to do with 'should we reintroduce beavers?' The overriding theme was 'we already have beavers, and we've gotta just live with them, and this is how we manage them'. [...] So the fact that illegal introductions have forced this situation on us, whether we like it or not, that just gets slightly under my skin."* (P6)

A similar observation has been made elsewhere. In Tayside (Scotland), a lack of formal process for beaver reintroduction in the locality was a driver of conflict, leading to a lack of trust between stakeholders (Coz & Young, 2020). Therefore, trust between parties in a BMG may be influenced by the method through which beavers arrive within a catchment. It may be that there was a formal process, or the group may be formed reactively in response to beaver presence. In the case of the latter, a greater potential for existing tensions may exist at the outset. Whilst this will have implications for the trust-building process (at least in the early stages of BMG formation), it may also suggest that proactive attention may need to be paid towards other catchments that beavers may yet move into and recolonise. Proactive intervention is more likely to prevent the potential for conflict escalation (Auster et al., 2019) (see section 5.4.2). This was highlighted by P5:

> *"what's really critical is to be ahead of the curve on this, and the way to get ahead of the curve is to have someone who, is to have an organisation and someone within that organisation who can keep an eye on things and say, 'yep we've spotted a beaver, or a family of beavers in the [...] catchment, we're gonna keep a watchful eye on them, we're gonna talk to the people who we need to talk to, and start getting a partnership agreed to how we can keep a watchful eye on this and manage it'. Otherwise, what happens is either you get situations which are just totally unmanaged, there may not be any problems but sometimes there are problems, [...] and then you're into a reactive situation, or you're in a situation where*

*no-one is wanting to take responsibility and starts shooting at each other, so to speak. [...] very important to be ahead of the game on beavers."* (P5)

### *5.6.2. Species variance*

Although they broadly support the principle of a reintroduction trial, it was highlighted by multiple ROBT Steering Group stakeholders that future trials of other species may not need to be as resource intensive. They suggested this was because beavers had a larger, landscape-scale impact through their ecosystem engineering behaviours than other species may have.

(No comments were made about this in the Tamar interviews.)

### *5.6.3. Scale, duration, and population decisions*

A series of factors were identified by the ROBT Steering Groups about which decisions would need to be made in future reintroduction trials. These included:

- **Population size:** Larger populations were reported by some Steering Group members to be desirable to realise ambitions, to support population viability and genetic health, and to enable enough impacts to occur that could then be studied. However, others felt smaller populations would be desirable, with a more cautious approach to reintroduction being preferred, meaning there is more of a possibility of ending a trial in the event of adverse impacts.

- **Trial duration:** There is a trade-off between time needed to address research questions, and the level of resource available to address such questions. The Steering Groups highlighted that there would need to be a recognition that research may continue past the end of a trial period, as it may not be possible to answer all the desired questions within a feasible timeframe.

- **Level of intensity:** Some Steering Group members raised an opinion that more trial requirements would require a higher level of investment. They felt this may inhibit the potential for benefits associated with reintroductions at a time of biodiversity crisis.

# 6. Conclusion: BMGs are a process

In the preceding section, learning has been gained from two governance groups responsible for beaver management in the south-west. Through the themes discussed, a series of lessons are identified that are applicable to the functioning of Beaver Management Groups in other contexts, if and where they exist in future. Other findings meanwhile highlight contextual features that may vary between catchments (e.g., the social and environmental factors highlighted in Table 6). These highlight that there is likely to be variation in management considerations between catchments, and if policy decisions require the implementation of BMGs, they may need to implement *"place-based, risk- based solutions"* (P9).

It was also identifiable that the situation is fast evolving in both catchments. In the River Otter, governance is shifting focus away from a nationally significant research trial to localised beaver management, and discussions are underway regarding how to adapt the Steering Group into a BMG. In the Tamar, a BMG has recently been established with the objective of governing local beaver management. This has so far held the first meeting of the full Forum, but the governance framework is already changing, with active discussions taking place on how to adapt to changing circumstances in both local and national arenas.

From this, we can conclude that there is a process at play here. Beaver Management Groups can be adaptive structures that evolve in reflection of changing circumstances and new learning. Rather than being a fixed governance structure therefore, Beaver Management Groups themselves are a *process*, that seeks to facilitate renewed coexistence between humans and beavers in catchment settings.

We have identified three key stages to in the beaver management group process: 'Formation', 'Functioning', and 'Future?':

- **Formation -** The foundation stage. This is where there is high investment from the leading organisation in building relationships and sharing knowledge, ahead of issuing invitations to join the BMG. A broad range of stakeholders and community representatives are identified within geographical boundaries and informed by prior experiences, but with consideration given to the social and environmental characteristics of catchments.

- **Functioning -** The group is in action. The BMG is actively engaging stakeholders and communities to coexist with and, where appropriate, manage beavers and human-beaver interactions. An efficient governance framework invites constructive discussion, inclusive of different views. Approaches to management are cocreated with the group to account for both benefits and conflicts holistically. Publics are engaged, and education takes place. BMG membership is adaptive to changing circumstances as beavers move through the landscape.

- **Future? –** There are questions about the future need and/or role of BMGS. As beavers become more widespread and are 'normalised' within the landscape, what

does this mean for the future for BMGs? It may be that less resource is required for BMGs in future, as people learn to live with beavers; there could be a role for a strategic regional-level BMG, with oversight of locally based BMGs; or the remit of a BMG could be reduced, and roles integrated within day-to-day actions of organisations and partnerships (e.g. Catchment Partnerships). This is an area for continued research and learning.

Throughout all stages of this process, there are external factors at play that influence the governance of these groups:

- **Reaction or Pro-action.** Relationship-building with stakeholders during 'Formation' and 'Functioning' stages may be influenced by the nature of whether the group was initiated proactively (prior to a beaver release or their natural dispersal into a catchment), or whether it is reactive to the presence of an existing beaver population (for which no body has yet held a remit for beaver management). In the case of reactive BMGs, there may be greater potential for underlying tensions with or between stakeholders regarding a perceived lack of formal process for reintroduction. This could mean a higher level of effort is required to overcome challenges in trust-building.

- **National Context:** The national context surrounding beaver reintroduction is changing, and national-scale decisions are being made. These will interplay with the running of a beaver management group (e.g., through the influence of legislation). This may inform what a BMG may be able to achieve, what advice a BMG is able to give, how a BMG may interplay with the role and resourcing of Local Beaver Officers, and the relationship between BMGs and statutory or regional agencies.

- **Resource Limitations:** Limitations imposed by the availability of financial or time resource were commonplace throughout these themes, influencing for example: the scope of BMG objectives; the frequency of meetings; scope and ability to undertake research or monitoring programmes; and the level of possible investment in a programme of beaver management or public engagement.

The three stages of the BMG process and the influence of these external factors is visualised in Figure 1 (which can be found following the Executive Summary at the outset of this document).

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# Appendix 1: Interview Questions

| Topic | Primary Question(s) | Further Prompts |
|---|---|---|
| **Participant Background** | Please describe your role in relation to beavers on the [River Otter and] River Tamar | |
| **River Otter Beaver Trial**<br><br>*(For participants who identified they had been involved)* | Have you read the paper which captures the experience of the ROBT Steering Groups? | *If yes...*<br><br>What are your thoughts about this paper?<br><br>Do you feel it reflects your own experiences of the ROBT?<br><br>Is there anything presented in the paper that you disagree with, and if so, why?<br><br>*If no...*<br><br>Please tell us a bit about your experiences of the governance groups/working with other stakeholders in the ROBT |
| **Tamar Context** | Please describe the context around beavers on the River Tamar. | Are there any similarities or differences that you would highlight between the situation on the River Otter and the River Tamar? |
| **Experiences of the Tamar and the Beaver Management Group** | Please tell us about your involvement so far with beavers on the River Tamar. | |
| | Have you been involved in setting up or sitting on the Tamar Beaver Management Group? | |

| | | |
|---|---|---|
| | *If yes...*<br><br>We are aware the establishment of governance for the Tamar beavers is in the early stages of development. As it currently stands, please describe the governance set up for the River Tamar.<br><br>What in the Tamar governance framework is similar or different to the governance framework for the ROBT (and why)?<br><br>Which stakeholder groups have been invited to take part, and how have they been identified?<br><br>How would you describe the response from invited stakeholders? | How has the Tamar BMG been developed?<br><br>Was this in any way informed by the ROBT?<br><br>Who identified the stakeholders?<br><br>Are they willing to take part in the beaver management group(s), or have you experienced challenges?<br><br>If an invited party has not accepted the invitation to take part, has there been any indication given for a reason as to why?<br><br>How have stakeholders responded to Devon Wildlife Trust's leadership role and has there been any influence of their prior experience from the ROBT? |
| | What level of commitment or resource has your leadership role involved? | |

| | | |
|---|---|---|
| *(For participants from an organisation in a leadership role)* | Are there any particular risks to you as an organisation in taking this leadership role? | |
| **Beaver Management in the Tamar catchment** | Asides from a governance framework, is there currently a management strategy for beavers on the River Tamar (or is there one in development)? | Has the ROBT Beaver Management Strategy Framework document been applied to or informed management in the River Tamar context? |
| | Are there any particular management issues that you have identified within the River Tamar catchment? | How have these been identified?<br><br>How do the identified issues compare to those in the ROBT? |
| **Broader public engagement in the Tamar catchment** | Outside of the beaver management group, has there been any public engagement activity by yourselves or management group stakeholders so far? | |

| | | |
|---|---|---|
| **Influence of the national context** | As the national context surrounding beaver reintroduction has developed (and the consultation has taken place), has there been any observable implications for the context of beavers in the Tamar catchment?<br><br>In the consultation, DEFRA referred to a potential of having Local Beaver Officers. Do you have any thoughts about this, and how such a role may relate to beaver management groups? | Previous study has identified uncertainty about the future of beavers as a potential contributor to concerns. Within this context, have you also observed any sense of uncertainty and are there any implications of this? If so, have you observed any influence of the national consultation proposals on this uncertainty? |
| **Open questions** | The River Otter Beaver Trial was a reintroduction trial, whereas for the Tamar (and now on the River Otter) this is more specifically about beaver management groups. Is there anything that hasn't been mentioned so far that you'd like to comment on regarding the relationship between a reintroduction trial and the formation of beaver management groups?<br><br>Is there anything else you think is important or would like to share about beavers on the River Otter, River Tamar, or of your experiences in establishing beaver management groups? | |

# Appendix 2: Interview Participant Summary

| Participant ID | Involved in ROBT? | Description of ROBT Involvement | Have they read previous study (Auster et al., 2022b)? | Do they feel their experience of ROBT been captured in previous study? | Lead on Tamar BMG? | Relationship with beavers, or Beaver Management Groups in the Tamar catchment |
|---|---|---|---|---|---|---|
| **P1** | Yes | Oversight of governance and delivery; liaison with stakeholders and funders; generation of funding; policy considerations; license holder. | Yes | Yes | Yes | Oversight of governance and delivery; liaison with stakeholders and funders; generation of funding; policy considerations. |
| **P2** | Yes | Delivery of advocacy approaches; community engagement; support for other team members. | Yes | Yes | No, but part of leading organisation | Advocacy; support for other team members. |

| | | | | | | |
|---|---|---|---|---|---|---|
| **P3** | Yes | On-the-ground beaver monitoring and management; engagement with stakeholders; educational work. | Yes | Yes | No, but part of leading organisation | Met with some landowners to provide advice; offered River Otter site visits for landowners. |
| **P4** | Yes | Project lead; oversight of delivery; stakeholder and community engagement; educational work. | Yes | Yes | Yes | Project lead; oversight of delivery; stakeholder engagement. |
| **P5** | Yes | Organisational strategy; advocacy; internal and external discussion | No | - | No, but part of leading organisation | Strategic oversight; advocacy. |
| **P6** | No | - | - | - | No | Fishery interest; witnessed beaver impacts in multiple locations. |
| **P7 and P8** | No | - | - | - | No | Landowners; beavers present on land since 2014 (multiple dams); former hotel business. |
| **P9** | No | - | - | - | Yes | Formal representation of organisation; support BMG formation; generation of funding. |

| | | | | | | |
|---|---|---|---|---|---|---|
| **P10** | No | - | - | - | Yes | Organisational strategy; organisational support for BMG formation; generation of funding. |

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# List of Abbreviations

BMG – Beaver Management Group

DWT – Devon Wildlife Trust

ROBT – River Otter Beaver Trial

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