

River Otter Beaver Trial Third Annual Report

April 2018



The ROBT team hosted a visit by the Secretary of State, Rt Hon Michael Gove and two local MPs, to see the impacts of beavers in December 2017

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The River Otter Beaver Trial (ROBT) is led by Devon Wildlife Trust working in partnership with The University of Exeter, the Derek Gow Consultancy, and Clinton Devon Estates. These organisations make up the Project Management Group. Expert independent advice is also provided by the Royal Zoological Society of Scotland, Dr Roisin Campbell-Palmer, Professor Alastair Driver, Professor John Gurnell, and Gerhard Schwab, an international beaver expert based in Bavaria.



The trial operates under a licence issued by Natural England (NE). The licence conditions are monitored by the Licence Group led by NE that includes Devon Wildlife Trust, Environment Agency, Devon County Council and Clinton Devon Estates.

The Steering Group includes many of the same organisations, in addition to a range of other experts and stakeholders including Sir Charlie Burrell, National Farmers Union, CLA, East Devon AONB, Devon LNP, Game and Wildlife Conservation Trust, Angling Trust, and the Salmon and Trout Association.

Funding for the ROBT comes from Devon Wildlife Trust (DWT), the Royal Society for Wildlife Trusts (RSWT), Peter de Haan Charitable Trust, Garfield Weston Foundation, Wellcome Trust, Natural Environment Research Council, the Tale Valley Trust, University of Exeter and from the generous donations from the public made to the Devon Beaver Appeal and through a dedicated crowdfunding website.



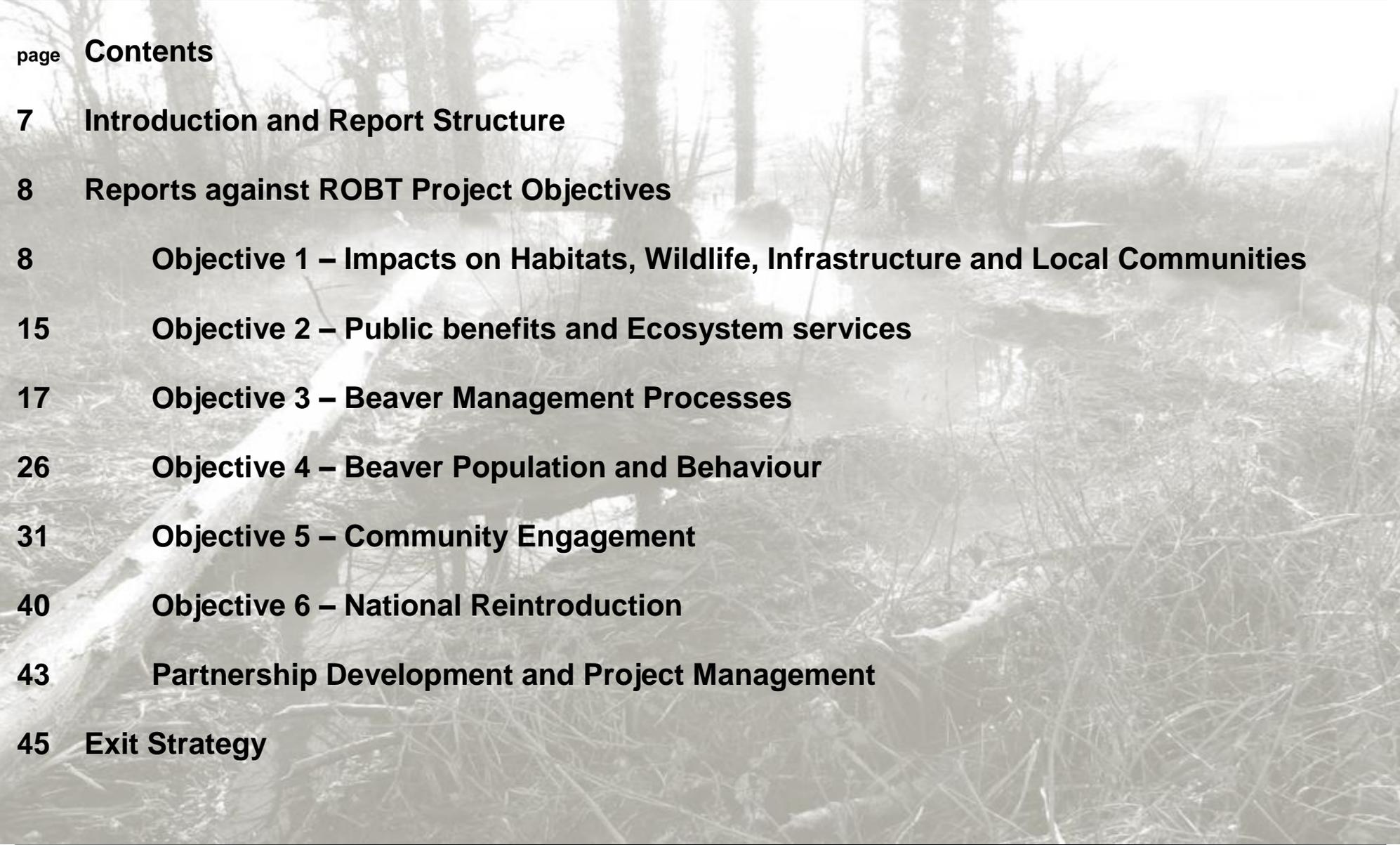
Key Headlines from River Otter Beaver Trial (ROBT) - Year 3 (ending March 2018)

- The River Otter Beaver Trial (ROBT) is now at the end of its third year. At the end of the winter survey and trapping season in March 2018, it is estimated there may now be as many as eight pairs of animals living in discrete territories. These are listed in the appendices (as territories T1 – T8) which are confidential due to the need to maintain the privacy of the landowners, and to avoid disturbance in certain parts of the catchment for the beavers and other wildlife.
- The national political context regarding beavers is rapidly changing, and the River Otter Beaver Trial has been instrumental in providing independent evidence to help inform key decisions. In December 2017, we hosted a visit for The Secretary of State, the Rt Hon Michael Gove, where we discussed the ecosystem services provided by beavers such as flood mitigation, as well as the management of conflicts. The Secretary of State announced that other Trials could now be licenced in England, and in Scotland, the legal protection of beavers is now being considered following their recognition as a resident native species.
- In preparation for a possible decision that beavers could remain in the wild on the River Otter at the end of the Trial in 2020, the ROBT Steering Group has established a Beaver Management Working Group to develop a framework for the future management of wild beavers. This document will present a framework to support decision making regarding the management of conflicts, potential funding for landowner support and management costs and governance. In summary the framework sets out how benefits arising from beaver activity will be maximised and how any potential negative effects which arise will be carefully managed.
- The ROBT Project team now comprises a Field Officer to work alongside the Project Lead within DWT and two PhD researchers within Professor Richard Brazier's group at the University of Exeter, who all work with the ROBT Management Group to implement the Work Plan.
- The Science and Evidence Forum revised the Monitoring Plan in 2017 which incorporates all the research elements of the Trial. The Forum brings together a robust body of independent evidence covering a wide range of impacts that the beavers are having. In addition to the existing PhD on physical geography, a new PhD was commissioned in January 2018 to investigate the socio-economic impacts.



A pond created by a long low beaver dam in a side tributary of the River Otter.

- In the Autumn, the Fisheries Forum met and discussed some of the potential impacts on fisheries – both positive and negative. Two fisheries research contracts are currently underway on the River Otter, but the opportunities for fish impact research are limited by the low number of dams on main watercourses used by migratory fish, and restricted understanding of key spawning areas for salmonids in the catchment.
- Interest in beaver reintroduction is increasing unabated and the demand for talks and walks is still insatiable. A total of 108 events have been delivered this year, including 64 presentations at conferences and local stakeholder group events. Over 4,500 people heard a presentation on the ROBT in 2017/18. These have included the Natural England Licensing conference in Birmingham, the Nottingham Biodiversity Action Group conference, and a diverse range of groups in Devon and Somerset. The Enclosed Beaver Project site is also receiving continued interest and we have conducted 27 tours for stakeholder groups that have contacted us, introducing approximately 200 people to the site.
- This public engagement / education work has secured engagement from a diverse range of audiences. 2,759 individuals responded to a detailed public perception survey carried out in early 2017 by the University of Exeter. This survey included detailed questions on a wide range of topics such as management techniques, legal protection and opinions on reintroduction. (These data are not currently available as the draft paper is currently undergoing peer review).
- Requests for visits often follow media coverage, and this continues to be extensive with at least 51 pieces of media coverage in 2017/18. Highlights have included a major BBC international news feature by Roger Harrabin on the work carried out by DWT and the University of Exeter on the water quality benefits of beavers, that was broadcast on BBC Radio 4's Today, BBC Breakfast, News 24 and on the BBC website. Other coverage on the BBC has included on Radio 2, 5Live and lots of coverage on local BBC TV and Radio news programmes in the south west. Escape to the Country and the Natural Histories programme (BBC R4) also featured our work.
- The beavers have also been widely covered in the print media, and national features have been secured in The Times, The Guardian and the Daily Telegraph in the last year.



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Introduction and Report Structure

Following the discovery of breeding beavers on the River Otter in East Devon, and a subsequent campaign by local residents and beaver enthusiasts, Devon Wildlife Trust (DWT) on behalf of the River Otter Beaver Trial partners was granted a licence by Natural England (NE) under section 16(4) of the Wildlife and Countryside Act 1981, to release Eurasian beavers, (*Castor fiber*), into the River Otter catchment in East Devon. This was to follow the capture and health screening of any adult beavers living on the river to ensure they were free of the tapeworm *Echinococcus multilocularis* and confirmation that they were indeed Eurasian beavers. The 5 year licence was granted on 2nd February 2015 following the submission of a detailed licence application which outlined the following goals of the Trial:

- To establish a healthy population of Eurasian beavers into a lowland English river catchment;
- To demonstrate that beavers will have a positive impact on the ecological health of the river system and associated riparian land; and
- To demonstrate that the beavers and their impacts will, on balance, be regarded by the local community and stakeholders as tolerable / positive.

In a complementary initiative, since 2011 Devon Wildlife Trust has been studying the impacts of beavers in a fenced enclosure in the Tamar catchment. The preliminary findings of this ongoing piece of work have demonstrated the great value that beavers bring to wetland ecosystems, and the other benefits that result from water storage in the headwater streams of river catchments. The contrasting nature of the enclosure and the river Otter beaver impacts has added a highly complementary new dimension to the River Otter Beaver Trial. As well as providing a scientifically controlled site to study the impacts of beaver dams on water and ecology that isn't currently available in the Otter catchment, it is proving a vital resource for stakeholder engagement and education of the potential impacts of beavers in headwaters.

The full Project Delivery Plan (Gantt chart) is available on request. For each of the 6 core objectives, an extract of the plan is included in this report and colour coded to show progress for the financial year 2017/18. For many activities the work is ongoing throughout the trial and the colours reflect this, and are graded as follows:

- **Red – Work not started**
- **Amber – Ongoing activities**
- **Green – Project Outcomes completed**

Reports against ROBT Project Objectives

OBJECTIVE 1: IDENTIFY AND ASSESS IMPACT OF BEAVERS ON HABITATS, WILDLIFE, INFRASTRUCTURE AND LOCAL COMMUNITIES

Principle Outcome: The impacts of the free-living beavers on the River Otter, its wildlife, the local economy and local people will be scientifically assessed and recorded to provide a solid evidence base on which the future of the population can be decided.

Activity	2017/18			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Implement Monitoring Framework				
Develop and maintain a system to record details of all costs attributed to the beavers activity, including from partner organisations				
Produce and disseminate interim reports on different aspects of Monitoring Framework (eg Biodiversity, Flood risk)				
Produce final report - Summary and assessment of total cost to land-use and infrastructure				
Produce final report - Biodiversity, Impacts on Species and Habitats				
Produce final report on Ecosystem Services - Water Resources and Water Quality				
Produce final research report on Social Impacts				

In April 2017, the Steering Group recommended that the **Monitoring Plan** for the Trial should be updated to take account of the work underway, revisions to research projects, and to prioritise the remaining strands of research that will be most relevant to decision makers at the end of the trial. The Plan is produced and implemented by the Science and Evidence Forum, chaired by Professor Richard Brazier from the University of Exeter. During the summer 2017 the Forum formally reviewed the plan, and the revised version was presented to the Steering Group in the autumn. (The plan can be downloaded from the DWT website).

<http://www.devonwildlifetrust.org/river-otter-beavers>

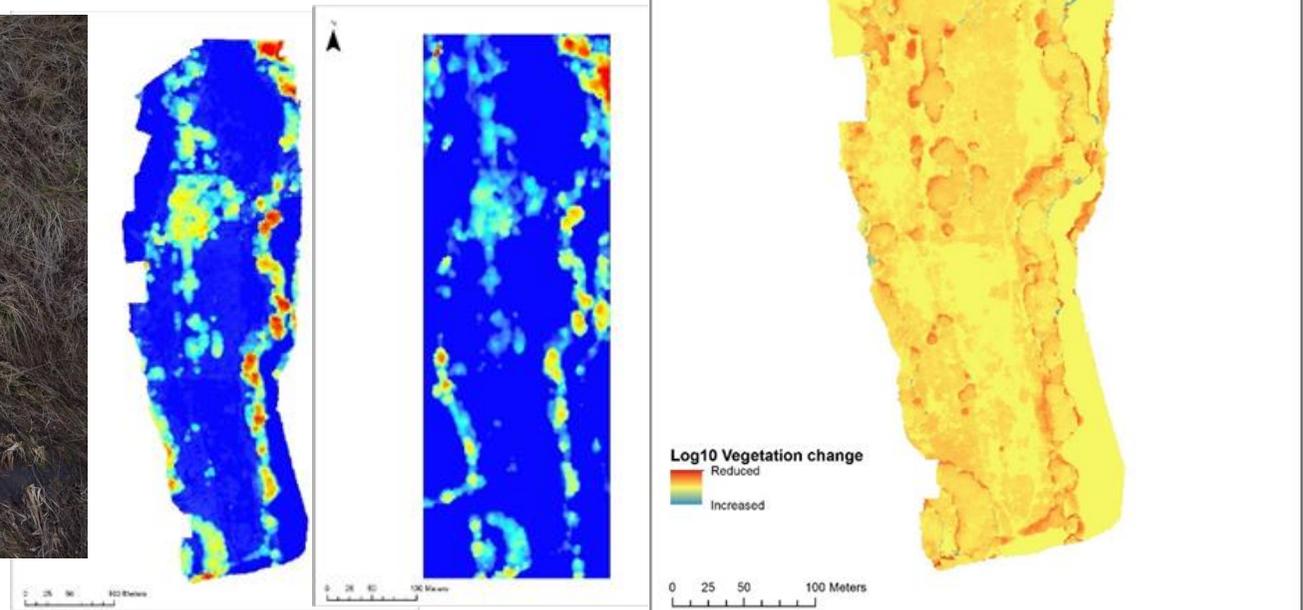
The revision process showed that most of the plan was being effectively implemented or exceeded. Particular progress had been made in those areas covered by the PhD being undertaken by Hugh Graham into the impacts on the physical characteristics of the river. Many areas of the plan where progress had been limited were in the socio-economic spheres, but this was being addressed through the development of a new PhD position at the University of Exeter. At this revision stage, some of the areas of ecological research were identified as non-essential and were downgraded to lower priority. Opportunities for student projects were retained, but it was decided that the Trial wouldn't proactively explore them.

The work being undertaken as part of the two PhDs are outlined in the most relevant chapters of this annual report. One aspect included here is the work that Hugh Graham is completing on the River Tale. To understand the **change in vegetation structure** resulting from beaver activity, aerial imagery has been collected from a quadcopter drone. This imagery is then used to create 3D models of the vegetation surfaces using structure from motion photogrammetry. Three flights were flown in 2016, and in 2017 four additional flights have been undertaken.

The maps present examples of how these data can be used. Model A (left) shows the canopy height in the early stages of beaver presence (July, 2016) and B (middle) shows the canopy height at the end of summer 2017. The heights of model B are subtracted from model A and the result is normalised (log10) to produce model C (right), a digital elevation model of difference (DEMD). This technique clearly shows areas of tree canopy that have been felled by Beaver. Some areas of loss around the tree crowns can be attributed to the difference in the seasonal timing of the flights.



Hugh Graham operating a drone



Supporting the vegetation structural change identified by the UoE work, the Devon Biodiversity Records Centre have been carrying out more detailed **botanical survey work** on the same site using quadrats and NVC analysis, and assessing the status of the County Wildlife Site. In 2017 they produced a summary report on the botanical work they have undertaken in the last 3 years. In addition to this, a volunteer has been employed to carry out vegetation transects in the areas where beavers have been most active to assess any detectable changes in plant communities.

In the spring, a detailed survey was carried out of **water voles in the River Tale** by local mammal specialist Mervyn Newman. This will serve as a useful baseline against which future changes in the water vole population can be monitored. Water voles like stable water levels and are therefore well suited to live in beaver ponds such as the one in Tale. Unfortunately, camera traps revealed the presence of a mink on the main water vole site in early 2018 which is likely to result in the loss of this water vole population if it cannot be removed.

The report produced in the early spring of 2017 “Beavers – Natures Water Engineers” continues to be widely disseminated to stakeholders. A further 3,000 copies were printed in April due to exceptional demand. This report contains some of the recently published work by the University of Exeter team working on the River Otter and at the Enclosed Beaver Project. Details of this stakeholder engagement are included in chapters 5 and 6 (below).

In the winter of 2017/8, two contracts were awarded to carry out **two separate research projects on fish populations**.

The Westcountry Rivers Trust carried out a **trout spawning survey** on the two main streams where dams are present, and where potential impacts on fish were identified. These were the Coleton Brook (Stowford stream) and a stretch of the River Tale. At the time of the survey, which was designed to coincide with the season for migration of sea trout, some of the dams were identified as potentially likely to impact movement of fish, and the report recommended trialling the ‘coarse resolution rapid-assessment methodology’ for these beaver dams and managing their impacts during migration in 2018. Subsequently all of the dams in the Tale were washed out during the winter floods, but one of the Coleton brook dams is still present, albeit at a lower level. Interestingly, when visited by the Avon Riverkeepers group, they suggested that the water quality in this brook might restrict rearing of fry, and that the dam might encourage adult fish to spawn in more suitable areas of the main river.



A small brown trout caught in the River Otter during invertebrate sampling work



New streams created around the side of beaver dams (T6)

Another watercourse where a dam has been built was not surveyed because it is assumed impassable by migrating fish owing to the man-made structures downstream. This dam now exceeds bank-top, and the raised water level now extends across the floodplain and the multiple new streams that emanate from the extended dam have provided bypass streams which would readily allow fish to move upstream. These new streams include spawning gravels, and the dramatic increase in habitat diversity is likely to enhance this location for fish (see left).

Southampton University **summarised and analysed the fisheries data** from three detailed surveys carried out through the ROBT. In the main River Otter, the combined sample of fish from the three electric-fishing reaches consisted of 43.4% bullhead (*Cottus gobio*), 37.9% minnow (*Phoxinus phoxinus*), 10.2% stone loach (*Barbatula barbatula*), 3.3% brown trout (*Salmo trutta*), 2.3% three-spined stickleback (*Gasterosteus aculeatus*), 1.9% lamprey (*Lampetra spp.*), 0.9% European eel (*Anguilla anguilla*) and 0.09% Atlantic salmon (*Salmo salar*). The stretch of river surveyed has had beaver activity since 2008 (this was the location of the first beaver field signs detected), but no damming has occurred here, and impacts on habitat quality for fish (positive or negative) has not been significant.

On the River Tale in the areas where a number of beaver dams have been built and subsequently washed away, electrofishing has been carried out on three reaches; upstream, downstream, and within impounded beaver ponds, and fish populations have been assessed on two visits, in 2016 and 2017. No firm conclusions can be drawn on long term impacts on such a small scale, but during the period when ponds were present, there was a noticeable decrease in abundance in the beaver ponds, especially of the small-bodied species such as bullheads which like the swift flow gravel substrates, and a higher biomass of brown trout indicating the more lentic habitat created was being utilised by the larger individuals of this species. These beaver dams had been completely washed away by March 2018, but may be rebuilt later in the summer, if the pattern of behaviour follows that of previous years.

The work has identified the need for more detailed surveys of the wider catchment, particularly looking at key spawning areas for salmonids, and it is hoped to work through the Fisheries Forum to achieve this in the coming years.

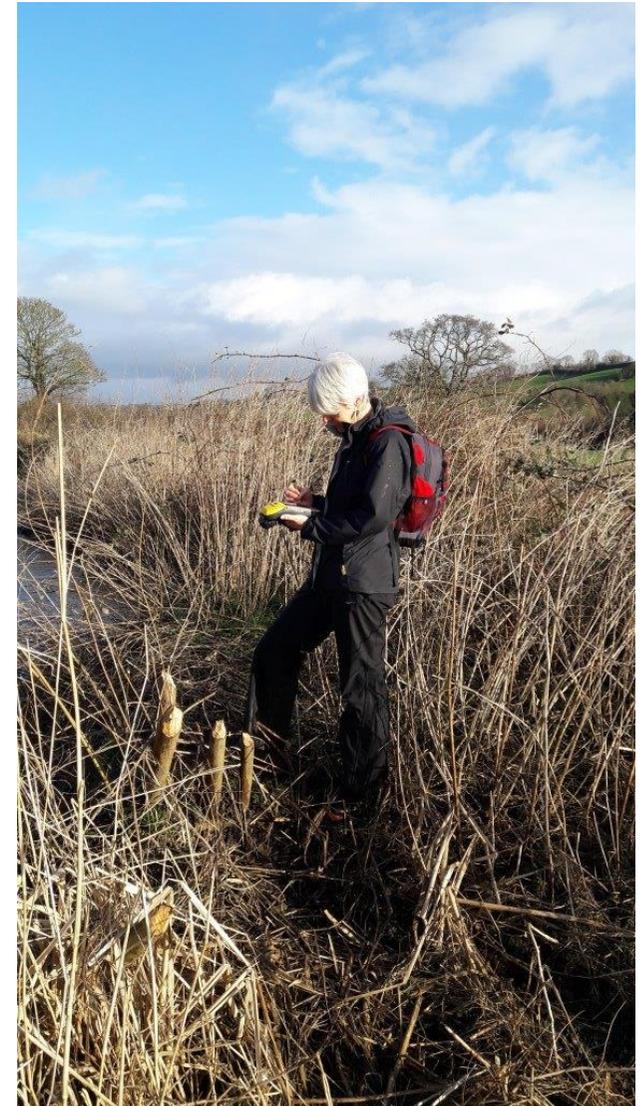
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Between January and March 2018, the **annual systematic walkover survey** was conducted. This covered 61 km of watercourses within the catchment and mapped in detail all of the field signs within those areas. In particular, it focused on trees impacted, and allows the production of 'heat maps' of activity. From these it is possible to identify approximate territories, especially when combined with anecdotal understanding of the different beaver families, and the annual winter trapping work also conducted between January and March.

The conclusion in March 2018 is that there are at least eight pairs or family groups occupying territories. A number of these territories are clearly demarked, but some of them appear to extend over significant stretches of river, possibly indicating the presence of more than one family group. Another complicating factor is that the population is made up of closely related individuals that might be more tolerant of other beavers living nearby, so territory boundaries may not be as clearly demarked. The relatively low population density also allows greater movement of individuals within the river, and this will likely change as numbers increase, and animals become more assertive in defending resources and territories.

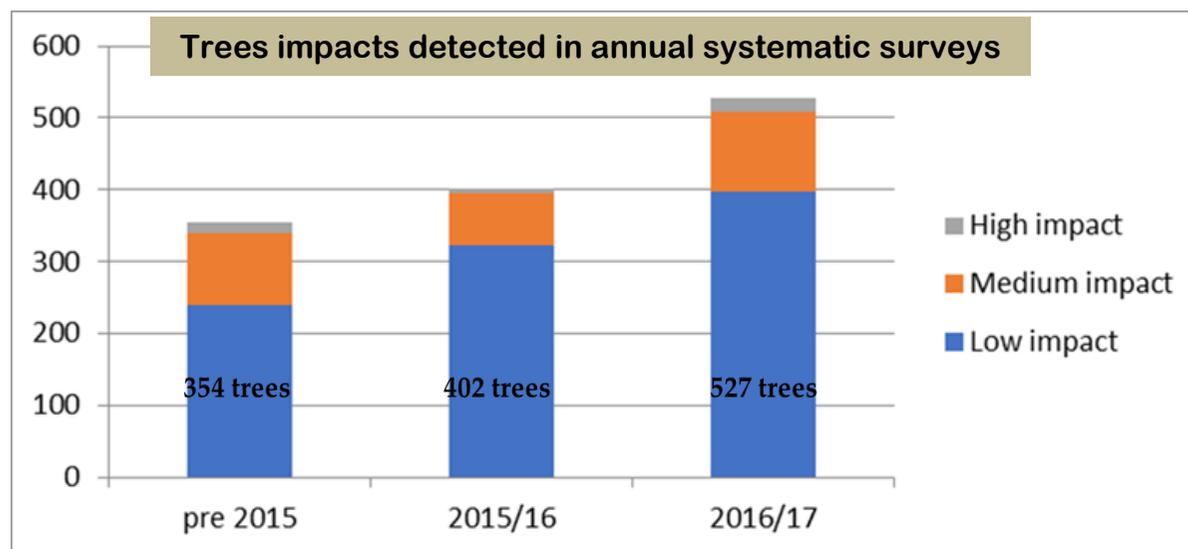
The heat maps and the descriptions of the individual territories are detailed in the confidential appendices.

Proactive and reactive work with farmers and landowners on the River Otter continues to be focused in those areas where beavers are most active. Throughout the year we made 150 visits to various sites in the catchment, visiting landowners, surveying and monitoring the beavers and their impacts.



*Systematic surveys are an opportunity to train others in survey techniques.
Elly Andison from the EA assisted with some of the survey work in 2018.*

In the past year there have been **two cases of landowners complaining about impacts on their trees**. This brings the total number of landowner complaints about tree impacts since the start of the trial to five. Due to the NE licence conditions, the threshold for complaints is simply a landowner expressing concern about the impacts. In all cases, these are met with a rapid response by the ROBT team, and positive relationships have been maintained in all cases allowing the monitoring of any interventions that have been carried out. With the exception of the one case where many trees were involved, all have been quickly and easily resolved with information and the provision of simple tree protection measures.



In the context of 1,283 trees impacted by the beavers in the catchment by April 2017, fewer than 20 trees had resulted in complaints from affected landowners.

It is interesting to compare the relatively low number of complaints with the total number of trees being impacted in some way (see graph above). The vast majority of tree impacts are where beavers are just trimming a few willow branches overhanging the river where landowners are largely unaware of their presence. Even for the larger trees where impacts are greatest, only a small proportion of landowners are complaining about this.

The most significant case was where a mature buffer of poplar and willow trees alongside the river had been planted to help stabilise the bank. The beavers had been living in this area from September 2015 until winter 2018, and had been feeding extensively and coppicing these trees, as well as many others in the area. The landowner had initially noticed some minor feeding signs and was visited in February 2017 as detailed in the last annual report. At this time, due to the large number of trees and relatively minor impacts, only advice was given, as it was considered likely that coppicing these larger trees would actually help stabilise the bank further and prevent the top-heavy trees pulling up the root plate and destabilising the banks, as frequently happens in the River Otter. However by April, the feeding had become more extensive and two poplar trees (>20cm diameter) had been felled along with four smaller trees. It was clear



Riverside poplar trees being felled by beavers

that the landowner was concerned about this and so eight other high-risk trees were protected immediately using fencing or beaver repellent treatments (see below). This effectively protected these trees, and a further three trees were later protected as well. The most recent survey suggest that the animals may have relocated the focus of activity elsewhere.

The second complaint in 2017/18 was a small willow tree at the end of a private garden near Tipton (see right). The smaller stem had been previously felled, and the second stem was being deeply incised. The felled stem was tidied up and removed and the remaining stem protected using weld mesh fencing (see chapter 3). No further impacts have been recorded here.



Willow tree at Tipton

The **socio-economic research** carried out by Roger Auster will help to reveal the range of perceptions landowners will hold regarding beavers and their impacts. It is assumed that there are a number of landowners within the valley that have unexpressed concerns about the beavers and the Trial, but the generally positive response that the ROBT team receive when in contact with new landowners where beavers are active, suggests this is not very widespread. Indeed, many landowners are delighted to have the beavers, and actively want to support them, and us in conducting this research.

It is however very clear that rapid and timely advice and practical support is critical wherever beavers are active in order to maintain these positive perceptions. All of the five complaints (about trees) received have been resolved with information and cost effective tree protection measures which have proved effective in all cases at discouraging feeding on those trees. If landowners were unable to secure advice and support, it is likely that their goodwill will have been significantly eroded.

NB. A further two complaints were received about dam building in previous years (as detailed in previous reports).

OBJECTIVE 2: IDENTIFY WIDER PUBLIC BENEFITS ASSOCIATED WITH BEAVER ACTIVITY IN THE LANDSCAPE

Principle Outcome: The value of beaver reintroduction and their influence on the provision of key ecosystem services is understood by key decision makers. Furthermore, the value of having beavers in the landscape is understood and exploited by a diverse range of sectors.

Activity	2017/18			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Whenever beaver dams begin to be constructed, install equipment for recording hydrology and water quality data wherever possible				
Work with consultant economists to devise research programme into the economic impacts within local (eco-tourism) businesses.				
Identify relevant local economic / tourism data already being collected and work with local businesses to record changes that occur.				
Advise local tourism providers on business generation relating to beavers in the River Otter.				
Produce final report on quantitative and qualitative assessment of the socio-economic value of beavers in the area				

The **PhD on physical geographical impacts being undertaken by Hugh Graham** from the University of Exeter is now approaching the end of its second year. All of the sites where dams are impacting on hydrology are being instrumented and studied in detail. One site in particular (T6) is providing a perfect case study for monitoring the potential benefits of a beaver dam on a community at risk of flooding. The long term historic EA hydrometric dataset on this watercourse is proving particularly useful, and the site is now regularly used for visiting stakeholders and decision makers, interested in Ecosystem Services and Natural Flood Management.

Sampling of aquatic invertebrates is continuing throughout the catchment, and samples analysed for any changes that might indicate changes in geomorphology, such as sedimentation. A large part of Hugh’s work is currently focused on the Beaver Restoration Assessment Toolkit (BRAT) which has been adapted from a tool developed to determine the potential for beavers to restore sections of degraded watercourses for fish in USA. As it is applied here, there is potential for it to be used on the River Otter to target areas for the provision of other ecosystem services such as flood relief (see chapter 3 for more detail).

In January 2018, **Roger Auster began a PhD at the UoE entitled “Quantifying the socio-economic impact of reintroducing the Eurasian beaver in lowland England.”** This body of work has been designed to incorporate those outstanding areas of the Monitoring Plan relating to the potential positive and negative impacts of the beavers on society. It is anticipated that the work will allow the production of the final report on the quantitative and qualitative assessment of the socio-economic value of beavers in the area. A very important part of this PhD will include a detailed analysis of the costs and benefits of the presence of beavers on the River Otter.

In one area of the lower river corridor, many of the issues coalesce, and will be studied in detail. The significant numbers of beaver watchers that visit in the summer, spend money in local pubs, hotels and restaurants. However, an issue has been raised by a trout fishing syndicate who fish the same stretch as the beavers inhabit and have expressed concern about the disturbance to the fishing that comes with such a large number of beaver watchers (Trout fishing picture - Alastair Rogers).



Despite the high numbers of events that the ROBT partnership have delivered, it has still not been possible to satisfy the very high demand for guided walks to see the beavers and hear about the Trial. It is felt there are real opportunities for local experts to provide some of these in a more commercial way, whilst maintaining high standards of information provision, and this has been explored with one potential provider. Another company, Wildlife Travel, have begun to offer trips to the River Otter as part of their mixed natural history tours of the UK. The Trial actively supports them and a proportion of the profits are donated to the Devon Beaver Appeal.

<http://wildlife-travel.co.uk/europe/devon>

OBJECTIVE 3: DEVELOP AN EFFECTIVE MANAGEMENT PROCESS FOR FREE A FREE LIVING BEAVER POPULATION

Principle Outcome: The impacts of beaver reintroduction are successfully managed and cause minimal local disruption. A representative understanding is secured of the nature and frequency of conflict and the costs / benefit analysis.

Activity	2017/18			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Provide a trusted source of advice and information on impacts and mitigation, contactable through a "Beaver hotline"				
Consider exchange visits to Bavaria and Brittany for locals to develop broader understanding of beaver ecology and management solutions				
Revise Management Strategy annually in light of developments in the River Otter Beaver Trial area and elsewhere				
Building on the experience of others, develop a system for mitigating impacts, using contractors and volunteers to implement measures				
Develop protocols with partner organisations to record and report impacts of beavers on infrastructure, and implement mitigation measures				
Over time assess the most effective way of incentivising landowners to accept the impact of beavers on their land				
Develop a series of factsheets on commonly encountered problems as needs arise				
Input experience into NE beaver management licensing protocols				

The ROBT team are effectively providing support and advice wherever it is needed within the catchment, and occasionally elsewhere and landowners and other interested parties are easily able to contact the project team. The Management Strategy remains a useful and relevant document for steering the response, and outlining decision making processes. It has not been necessary to revise this plan annually as had originally been envisaged.

However the ROBT Steering Group are now actively preparing for the end of the Trial in 2020, and developing a **Beaver Management Strategy Framework for beyond 2020** should the beavers be permitted to remain in the River Otter at the end of the Trial. A Working Group has been established with representatives selected from key stakeholder organisations to review the current management strategy and learning from the experiences of others both in the UK and internationally. The draft outputs from this work will be circulated to key stakeholders in 2018 / 19 for further discussion. It is hoped this will allow the necessary governance and structures to be put in place in a timely manner in 2020 if a decision is made to maintain the beavers on the river at the end of the Trial.



As part of this work an **international perspectives questionnaire** was developed and circulated to other countries where beavers and people live alongside each other. Detailed responses were received from Belgium, Massachusetts (US), California (US), the Netherlands, Scotland and France. A more detailed version was also completed on the Bavarian model as part of a fact-finding tour attended by the ROBT Field Officer, and members of the Steering Group. It is felt the trailblazing work being done in Bavaria has many very relevant aspects that will be transferable to a British model, and another similar trip is planned for April 2018.

Gerhard Schwab, discussing beaver feeding on maize in Bavaria as part of a fact-finding tour in 2017. Many of the partners and stakeholders have now been on these trips organised by Derek Gow and Gerhard to showcase the beaver management techniques that work so well in Bavaria.



In October 2017, the **Infrastructure Monitoring procedures** and sites were revised in consultation with the Environment Agency. This has been carried out in order to prioritise the monitoring of key sites at high risk times of the year when beavers are most actively ‘engineering.’ It also incorporates important infrastructure that has been identified by other partner organisations.

A total of 32 sites are now visited regularly during the autumn and winter months, looking for signs of recent beaver activity in the vicinity, and for any damming or burrowing behaviour in key locations. Each site has a specialist contact in the event that activity is detected. The sites have now been allocated an Infrastructure Monitoring ID number - IM ID according to their reasons for monitoring:

- HM = Hydrometric Monitoring station or equipment
- FD = Flood Defence infrastructure
- FISH = An important watercourse for salmonid passage / spawning
- WQ = Water Quality / Sewerage Infrastructure
- P = Proactive monitoring (eg. Politically sensitive, high risk for surface water flooding, canary sites near catchment boundaries)



Techniques for **protecting trees** from beaver gnawing are working well and being honed as the Trial progresses. Different techniques are now employed to protect trees, depending on the circumstances and wishes of landowners. In 2017, the ROBT trialled a new technique where sand was mixed with a widely available synthetic latex (Styrene Butadiene Rubber - SBR) which is flexible and waterproof. This is further developing the use of sandy paint that was applied in 2016. The other advantage of this technique is that SBR dries clear, and so only the natural sand colour is visible after application (see right).



Trees being painted with a sandy SBR mix, which dries clear, just leaving the natural sand colour



This tree at Tipton St John was protected with weld mesh fencing to prevent further gnawing.

This has been employed effectively on four sites this year where trees were already being gnawed, or thought to be at particular risk. On the Tipton St John recreation ground a Trustee had requested advice and support from the project highlighting an older tree where feeding signs dated back to 2015/16. This was given a coat of SBR, as were the remaining apple trees in an orchard on the River Tale where there was beaver activity nearby. Three larger trees were also given a protective coat further downstream close to another beaver hotspot. The fourth site is near Ottery St Mary where the buffer of poplar and willow trees were being felled, and the landowner was concerned about the impacts as outlined in Chapter 1.

In some cases, however, a ring of weld mesh can be applied very easily, and to the satisfaction of the landowner, who may feel the tree is better protected with a physical barrier (see left). This continues to be as effective, although costs and visual impact are slightly higher. This was used very effectively on the willow at Tipton St John.

On the more complex site near Ottery St Mary, there was a good opportunity to use both options, to assess their relative efficacy. This has revealed that both techniques appear to work equally well, for the short term at least. Whether the SBR needs reapplying remains to be seen, but in many cases (including this one) immediate protection may be all that is necessary as the beavers soon move on to another site.

A particularly large oak tree was also protected on one site where the landowner had just wanted to ensure there was no risk to it.

In November 2017, a **report of a beaver body** being recovered from the A30 where the River Tale is culverted under the road (NGR SY 086 975) was received. Following local research, a vet in Honiton reported that they had had a dead otter brought in from the same location at around the same time. This was thought to be the most likely explanation

In early February, a **beaver sighting was reported in the Exe Estuary**. It was reported to have been seen crossing the Exeter Ship Canal between the M5 and Topsham. The description was credible, although it would be an unlikely place for a River Otter beaver to turn up. Due to the potential sensitivity of the location, and the need for us to follow up any reports of beavers in adjacent catchments, the area between the Turf Car Park up to Countess Weir Bridge was thoroughly surveyed on both banks the following day. No signs of beavers were detected, and if a beaver was resident in this area at this time of year, it would be possible to find signs easily. However, the managers of the area, Exeter City Council, were contacted to ensure they were aware of the possibility, and other reports in the area would be quickly followed up.

At the end of June 2017, an **incident between a dog and a beaver** occurred within the main river beaver territory near Otterton. A medium sized dog was in the river close to where the adult female beaver had kits in a maternity lodge. The dog appeared to be tracking through the shallows adjacent to an area of emergent vegetation, and appears to have come across an adult beaver that was hidden there. It is assumed they startled one another and a short fight occurred during which the dog sustained a number of nasty bite wounds. These required veterinary treatment, including anti-biotic treatment for infection. It is unclear whether the beaver sustained any injuries.

Contact was made with beaver experts in Bavaria and North America who reported it as being a fairly frequent occurrence in areas with high public access and active beaver territories in the early summer when young kits are in and around the natal burrow. The advice was to ensure dog users were informed of the location of beaver burrows and the need to keep dogs out of the water in their vicinity at this critical time of year.

On the River Otter, relatively low key signage had been in use over the past two summers primarily to reduce the disturbance to the beavers and other wildlife. However conspicuous signage is not popular in the countryside either with the public or landowners, and concern was expressed by some that highlighting the location of beaver maternity lodges would merely encourage greater public use and disturbance. The general feeling however is that beaver watchers are generally quiet and self-policing, and a group of people watching beavers will discourage less sensitive footpath users and reduce the likelihood of dogs entering the water.

The incident did however also raise the issue of conflicts between some of the beaver watchers and other river users, primarily sea-trout anglers who are seeking to quietly fish in pools at dusk and into the night, and for whom disturbance by lots of people is a major conflict. There were also unfortunate cases of them being verbally abused by some ill-informed enthusiasts. As a result of this, the anglers are reporting that some pools within their beats are no longer desired areas to fish, and so they are in discussions with the owners of the rights about the value of the fishing. This is being actively explored as part of the socio-economic impact study.

Having considered this issue carefully, **larger temporary signs (right)** were produced which will be used to highlight certain areas of the river where beavers are active in the summer and where dog owners in particular, need to be aware of the risks. This will be supported with a low-profile presence on the river to encourage responsible behaviour.





Beaver dam constructed in early 2018 in stream near Otterton

Beaver dams of varying sizes are now being constructed in four of the territories. These dams vary enormously but in many cases are just low banks of soil (see right), constructed in existing wetlands to deepen and retain existing waterbodies.



On one site a large wide dam across a stream, has created a new wetland habitat just upstream of a community that suffers from flooding. The landowner here is working closely with us to monitor and mitigate the impacts on the tenant farmer, whilst being keen to retain the beaver-created wetland if possible. This type of case study will be key to the cost benefit analysis work being undertaken by the University of Exeter.

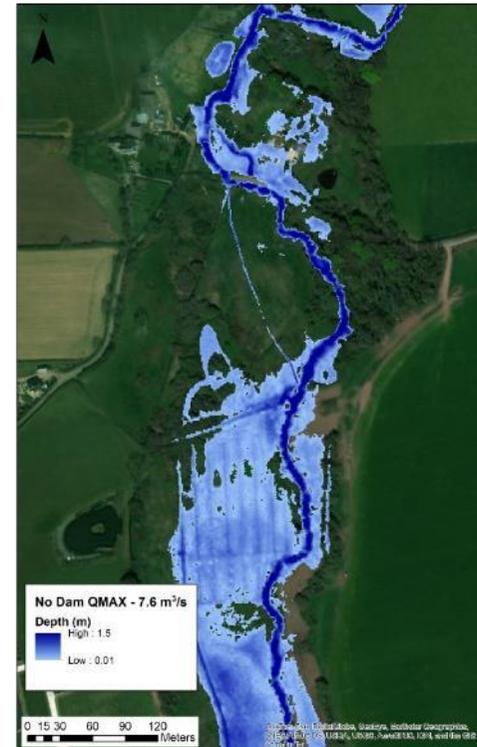
In the winter 2016 / 17 the team installed a **flow device** on a dam that was causing inundation of floodplain pasture land. Following some alterations, this effectively brought the water level down so that the pasture was free of water. The impact on the beavers isn't quite clear as it isn't possible to monitor the behaviour of individual animals. Beavers are still present and active in the area, although it appears they are now using other dams within the territory and have developed others.

On one site in the River Tale (T4), the beavers have built dams within the adjacent habitat and also the main channel. The dams in the main river appear during the summer months, but are not able to withstand the full force of the River Tale during peak flows. However properties in the area have been flooded in recent years from the river, and it was important to demonstrate to homeowners that beaver dams would not increase the risk of flooding to their properties.

The University of Exeter carried out **1D flow modelling** using HECRAS 5.0.3 to classify the inundation depths that may result from an average winter flood (QMED) and a maximum flood (QMAX). Values for QMED and QMAX were based on the data collected from the Fairmile gauging station further downstream on the River Tale.



From these they were able to demonstrate that the nearby highway bridge was the major cause of flooding and that the dams in their current location had no influence on flood risks due to the gradient of the watercourse and floodplain.

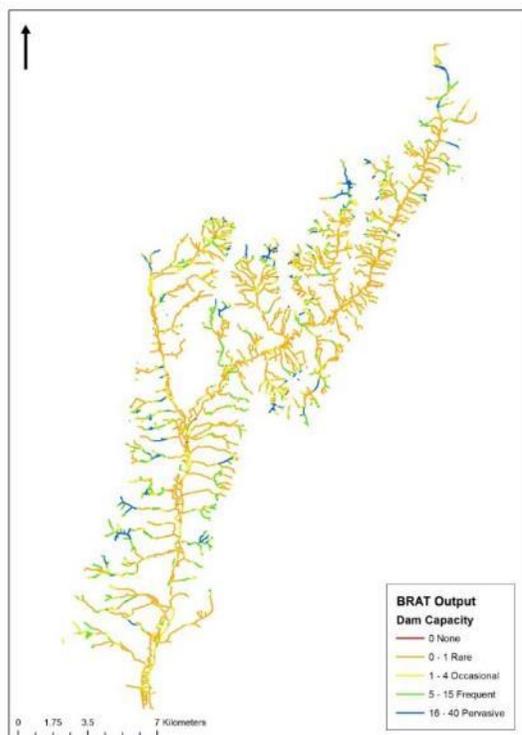


They also produced a map (top right) to show where the location of beaver dams would be a risk, so that immediate action could be taken in the event that beavers did build structures in this reach.

In order to clearly demonstrate the gradient, a staging board was installed to highlight the level that the water would need to back up to, if it were to increase the risk of flooding to the properties at risk.

Over the last year significant progress has been made with the **Beaver Restoration Assessment Toolkit (BRAT)**. Three models are currently under development to help increase the catchment scale understanding of beaver dam capacity, any conflicts or opportunities associated with these dams and the ecological carrying capacity of the catchment. All models are constructed in Python 2.7 and utilise the arcpy (from ArcGIS 10.5) geographic information system (GIS) module.

Dam Capacity modelling - Understanding the capacity of a section of river to support dams is fundamental in revealing the potential impacts of beavers.



The approach to this modelling is based on work by Macfarlane et al. (2015) where the authors modelled dam capacity across Utah (USA). Although a different species, it is widely considered that the behaviour of Eurasian and North American beavers is very similar when environmental characteristics are equivalent. The model has been developed to utilise readily available spatial datasets across Great Britain.



A river network is split into <200m reaches. The surrounding vegetation suitability is determined for each reach, and the hydrological characteristics are obtained from topographical data and the contributing catchment area. This information is then used in a rules-based fuzzy inference system (FIS) to calculate the density of dams that a given reach can support. The model has been run for the Otter catchment, and also the Tay/Earn catchment to validate the model in an area where more dams are present. This has proved very effective and the model has been found to be a reliable predictor for where dams have, so far, been constructed.

Conflict / Opportunity Mapping – By combining other datasets with the results from the dam capacity modelling, it is possible to identify where potential beaver dams may affect surrounding land use. If key infrastructure or housing is present in a given area and the channel can support considerable damming then the reach is considered high risk. Where valuable farmland is within the potential area of inundation, a higher level of risk is highlighted. In those reaches where surrounding land is not considered of high agricultural value or where semi natural conditions occur, and dam capacity is high, the reach is considered to present an area of opportunity where beaver activity should be encouraged. The flexible design of the model allows for other new spatial datasets describing areas of risk to be incorporated easily.



Territory Capacity Modelling - Within the time frame of the ROBT, the beaver population will not approach ecological carrying capacity of the beavers within the entire catchment, but an important element of the Monitoring Plan is to attempt to determine what this is. The key factors that limit the population size in a catchment are available suitable habitat and population dynamics. Using dam capacity and vegetation suitability in conjunction with empirical findings on beaver population dynamics, it is possible to simulate the maximum number of territories that can be supported. Over the course of 2018, this part of the model will be peer reviewed so that an approximate maximum number of family groups can be estimated, which will help inform the resources necessary for longer term management of beavers in the catchment.

OBJECTIVE 4: UNDERSTAND THE ECOLOGY, BEHAVIOUR AND POPULATION DYNAMICS OF A BEAVER PROPULATION IN A LOWLAND, PRODUCTIVE, AGRICULTURAL LANDSCAPE

Principle Outcome: The success of the establishment of a beaver population on the River Otter is assessed, and an assessment of welfare according to their ability to adapt to an English landscape. Also a comprehensive understanding of the future dispersal and population dynamics of beavers in lowland UK river systems is developed.

Activity	2017/18			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Collate records of beaver sightings and produce annual GIS maps				
Engage with local beaver enthusiasts and volunteers to monitor key populations				
Identify potential future release sites based on distribution of current population, and suitable habitats				
Trap and fit ear and PIT tags, and health screen all beavers living on the river wherever it is reasonable practical to do so				
Carry out DNA analysis of the beaver population, to understand species, genetic diversity and population dynamics				
Based on DNA analysis, decide how best to augment the population with additional individuals, if required				
Introduce first pair of health screened animals into location agreed with NE, and in accordance with agreed protocols				
Introduce second pair of health screened animals into location agreed with NE, and in accordance with agreed protocols				
Introduce final individual beaver if necessary to supplement a lone individual, or to replace a animal that dies.				
Monitor health and welfare of beavers, with veterinary intervention where required. Identify local veterinary consultants for involvement in project.				
End of project - health checks of beavers				
Production and dissemination of final report into health status of population and any veterinary concerns to public, livestock and wildlife health				
Produce and disseminate interim reports on the population dynamics of the beavers on the River Otter				
Produce and disseminate final report on the population dynamics, dispersal of the beavers and likely future carrying capacity of the River Otter				

The beaver population on the River Otter is thriving. At the end of the winter survey and trapping season in March 2018, it is estimated there may **now eight pairs of animals living in discrete territories**. These are listed in the appendices (as territories T1 – T8). The number of territories suggests that the larger family groups have dispersed and separated, and young pairs are forming new territories.

The use of ear tags by the Trial is allowing some unusual observations to be made, which may be a symptom of the small and dispersing nature of the population in the catchment. The fact that many of the animals are so closely related may also be a factor in this, allowing movement of animals though occupied territories which might not normally be expected.

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One of the pair that had been living in the lower part of the catchment (T5) in 2017, was trapped in the River Tale in February and March 2018 (now T8).

On 6th March 2017, one of the kits born near Otterton (T2) in 2016 was trapped and fitted with an orange ear tag. This was filmed and broadcast for the BBC 2 programme ‘Hugh’s Wild West.’ This young animal was seen a few weeks later on 30th March down near white bridge in the estuary. Then remarkably, a video of this animal was sent to us by a member of the public, taken just below the lower Otterhead dam, which is 46kms upstream from white bridge (now T7). This is a very unusual journey for a one year old animal.



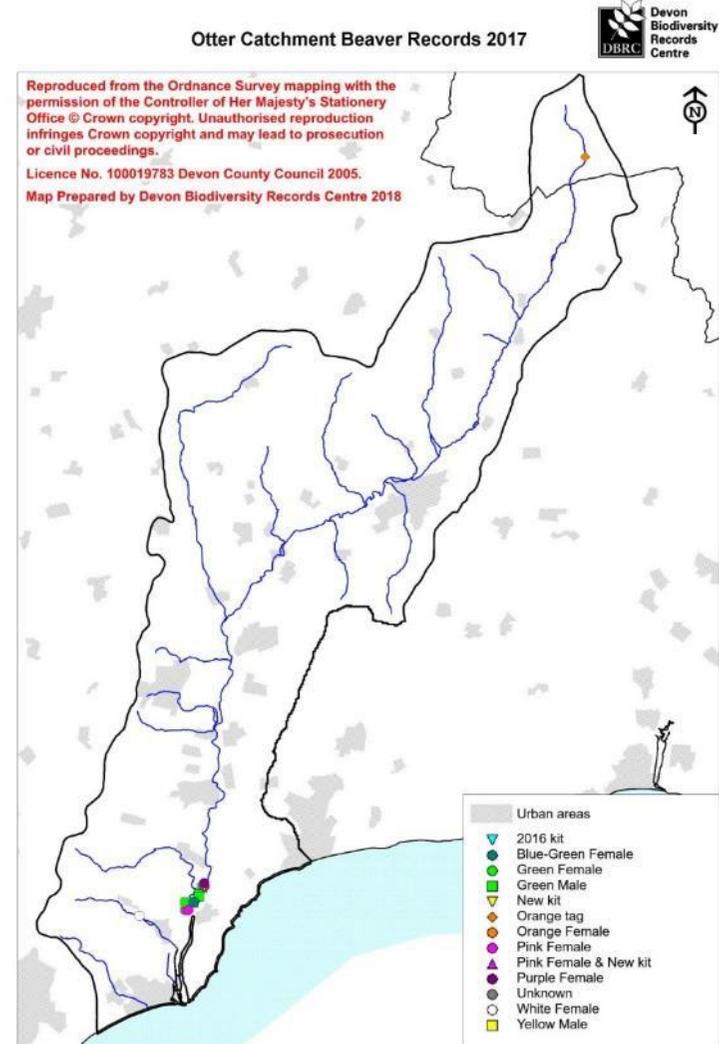
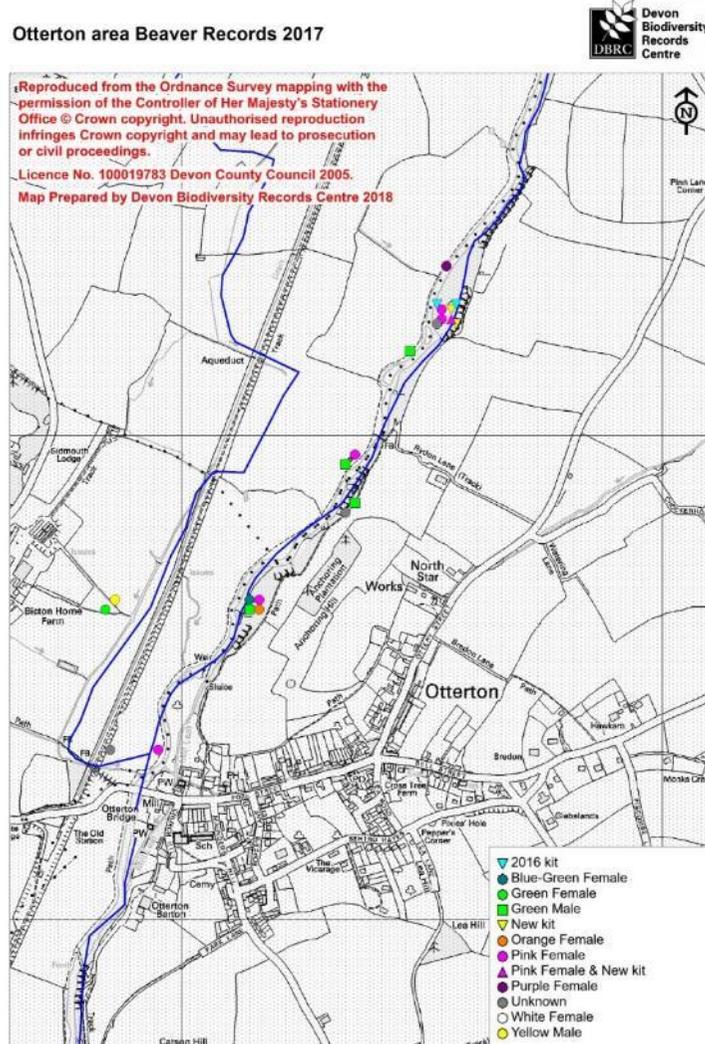
The Otterton kit being released by Hugh Fernley-Whittingstall after being given orange ear tags (above)

The additional pair that were released in the River Tale (T4) in May 2016 to enhance the genetic diversity of the population successfully bred in 2017, and two kits have been detected using the remote high resolution cameras here. This is a still from this video of one of these kits with an adult (left).

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Maps are produced by the Devon Biodiversity Records Centre (DBRC) that show the **records that have been submitted** for each calendar year. They include trapping records, but not camera trap sightings.

NB – because they are for the calendar year, they show the winter trapping from Jan – March 2017.



Trapping and tagging of young animals born on the river during the Trial is continuing. The season for trapping beavers is generally during the winter months when there is no risk of trapping a heavily pregnant female, or one with dependant young.

Pictures of winter trapping, health screening and ear tagging being carried out by Dr Roisin Campbell-Palmer, and Ed Langdon of Clinton Devon Estates (courtesy of Francisco Teles)



An assessment of samples taken during the 2017 trapping season, concluded that all beavers trapped were in good body condition, with no obvious signs of disease or injuries. Blood and faecal samples were laboratory tested for a range of organisms including *Cryptosporidium spp.*, *coccidia*, *Giardia spp.*, *Yersinia spp.*, and *Salmonella spp.*, *Campylobacter spp.*, Johnes (mycobacterial) disease, with no signs of infection in all cases. The only abnormal health screening result identified was a suspected *F. hepatica* (liver fluke) sample from beaver F6183 (in T5) in January 2017. It is possible that the reported result of *F. hepatica* in this case was the result of a true infection of that individual, but the possibility of misidentification with intestinal trematode *Stichorchis subtrequetrus* is a possibility as PCR methods were not applied by the laboratory. However a discussion with the manager of the dairy farm on this site revealed the long term presence of liver fluke in this area of the farm, and their ongoing need to treat cattle for this infection.

In the **2018 trapping season**, beavers were caught on a total of 14 occasions, and seven new beavers were trapped and tagged between during February and March 2018. Two adult females were re-trapped and were showing signs of pregnancy, and the general health status of captured animals was assessed to be good with no obvious signs of injury or disease. It has not felt necessary to take blood and faecal samples during this winter trapping season, but a more detailed health assessment of the population is scheduled to take place before the end of the Trial.

On the 26th March 2018 Devon Wildlife Trust received a phone message from an anonymous member of the public reporting the location of a **dead beaver by the side of the road at Langford Bridge** near Honiton. The Field Officer immediately visited the site and found a dead beaver in a hedge next to the road. It was recovered and taken to New Street Vets in Honiton where a Post Mortem was undertaken the following day, using the methodology provided by Dr Roisin Campbell-Palmer. The post mortem identified the beaver by locating and scanning the PIT tag. The beaver was a four-year-old female, born in the catchment in 2014. She was trapped by APHA in February 2015, and re-released at the start of the River Otter Beaver Trial in March 2015. The remains weighed 19kg, and she was in very good condition and pregnant at the time of death. Part of one foetus was discovered during the examination.

The road traffic accident had caused significant damage to the head and broken the right rear leg. The accident had also caused significant internal injuries. The internal organs had also been scavenged upon, so some samples could not be taken. There were no signs of any car parts on or near the beaver and no skid marks could be seen on the road.

The licence allows ROBT to **release further beavers** into the catchment before the end of the trial, and options to obtain unrelated animals are being actively explored for 2018.

Dead beaver on the side of the road near Honiton (March 2018)

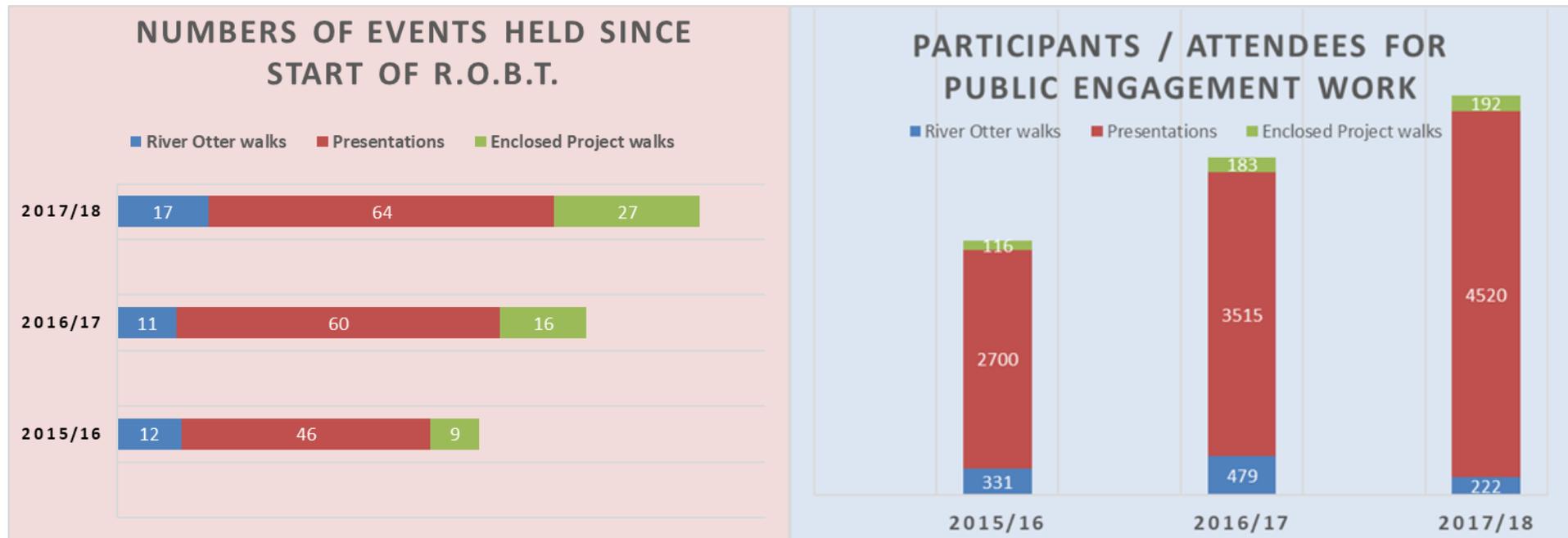


OBJECTIVE 5: INCREASE KNOWLEDGE AND AWARENESS WITH LOCAL COMMUNITIES AND OTHER KEY STAKEHOLDERS OF BEAVERS AND THEIR INTERACTIONS WITH THE LANDSCAPE

Principle Outcome: Beaver ecology and impact is well understood. The community is well informed and able to make representation on the future of the beavers. The community have benefitted from a diverse interpretation programme and have been driven the opportunity to re-connect with and value nature.

Activity	2017/18			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Deliver workshops on beaver field signs and ecology for stakeholders and volunteers				
Encourage submission of recent and historical records via project website, dedicated email and hotline				
Recruit a team of volunteers to assist with various aspects of the project				
Provide detailed training for volunteers to allow them to take on their particular roles and responsibilities safely and effectively				
Encourage and motivate volunteers, ensuring quality of data collection and safe working practices. Host annual update event / conference				
Develop and maintain a system of regular updates on Social Media, and through press releases				
Develop and maintain a ROBT pages on the DWT website				
Continue to publicise the contact details for the project / Beaver Hotline for reporting observations / incidents / areas at risk				
Produce quarterly electronic ROBT newsletter, and annual paper update				
Run regular guided walks on River Otter, increasing awareness and understanding of the beaver population				
Provide talks for key stakeholders and others in accordance with communications and community engagement strategy				
Visit schools in the catchment to raise awareness of the project				
Identify and engage with local businesses / forums / tourist boards				
Work with film makers and other media to disseminate accurate information about beavers and the ROBT				
Devise and implement a qualitative sectorial assessment of changes in perception regarding beavers in the River Otter				
Carry out an initial beaver perceptions survey among local and national stakeholders				
Repeat beaver perceptions survey among local and national stakeholders				

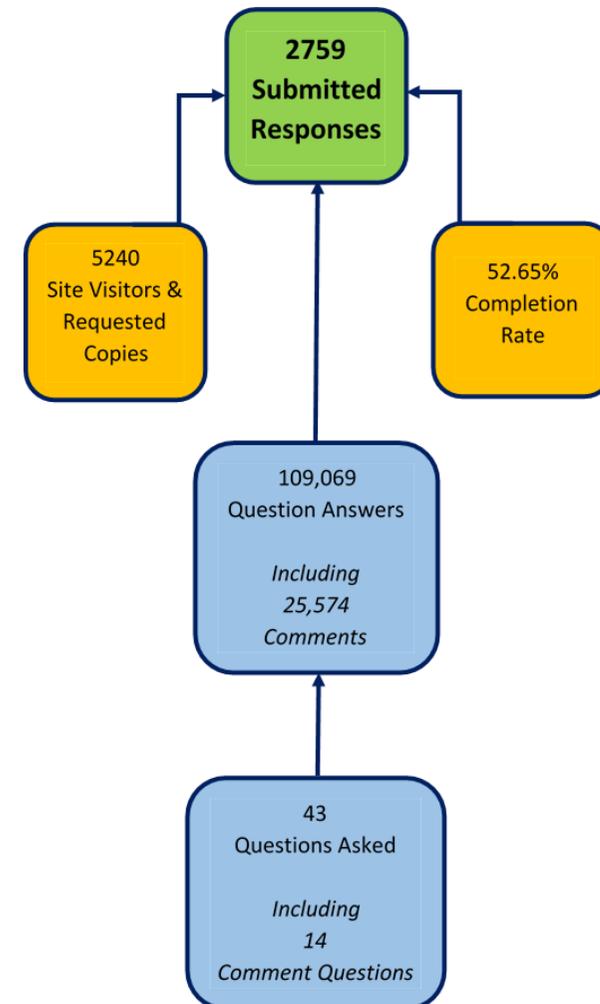
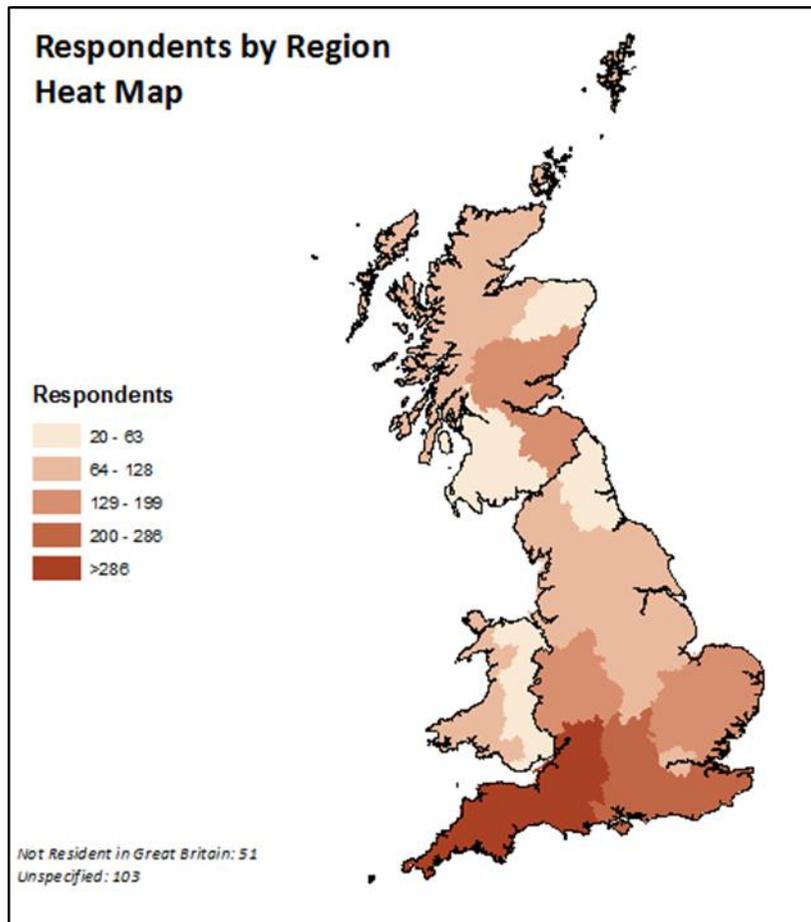
The **public engagement work** continues to be an important and significant aspect of the ROBT, with the demand for talks and guided walks around beaver habitats increasing as the work of the Trial becomes more widely known. In the current year we've carried out a further 108 talks and walks to an estimated 4900 people. This brings the total number now conducted since 2015, to 262 events to an estimated 12,250 attendees.



Perception questionnaires are now distributed as part of many talks, and attendees are asked to complete four questions at the start and then again at the end of the presentation. The data which are being collected will allow the University of Exeter to assess baseline perception and how this changes when presented with information about beavers, their ecology and impacts.

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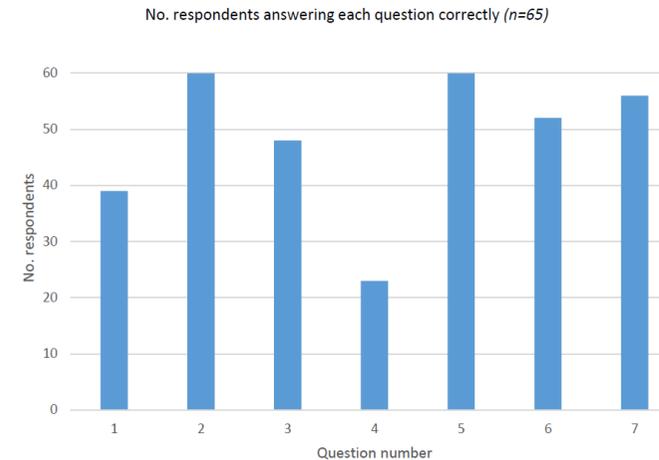
In the previous annual report, a large public perception survey on beaver reintroduction had just been completed. A total of 2,759 people had responded and this survey which has since been written up and submitted for publication in the academic journal 'Human Dimensions of Wildlife,' and is currently undergoing a peer review process. For that reason, the results are not currently being disseminated, but they should be available in the coming year.



A questionnaire was also completed by people that came to the beaver stand at the **Devon County Show**. A total of 65 people filled in the questionnaire which revealed the levels of knowledge of beavers by participants with seven questions. They were subsequently asked whether they supported reintroduction and whether they felt able to express their opinions to a member of the ROBT team. The results are shown here.

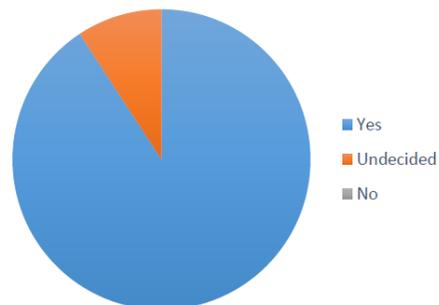
Respondents were asked in a short questionnaire what they knew about beavers and the 'River Otter Beaver Trial'. Questions were as follows:

- Seven True or False Questions:
 1. Beavers live in a dam (False)
 2. Baby beavers are called kits (True)
 3. Beavers are vegetarian (True)
 4. Beavers are mustelids (False)
 5. Beavers were once widespread across the English countryside (True)
 6. The 'River Otter Beaver Trial' is funded by the government (False)
 7. The Scottish Government will allow beavers to remain in Scotland (True)

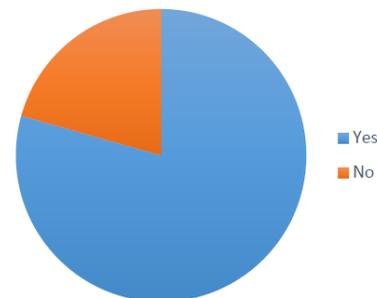


Support for Reintroduction and Ability to Express Opinions to Member of 'River Otter Beaver Trial'

Does respondent support the process of beaver reintroduction to Great Britain? (n=65)



Does respondent feel able to express their opinion to a member of the ROBT? (n=63)



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Local communities in Devon and Somerset have been particularly interested in the new mammals now living in their locality. The demand for information about beavers and their ecology continues, and the ROBT partners have done their best to meet this demand. Local community organisations like the Otter Valley Association and Sidmouth U3A have received presentations where around 100 people have attended.

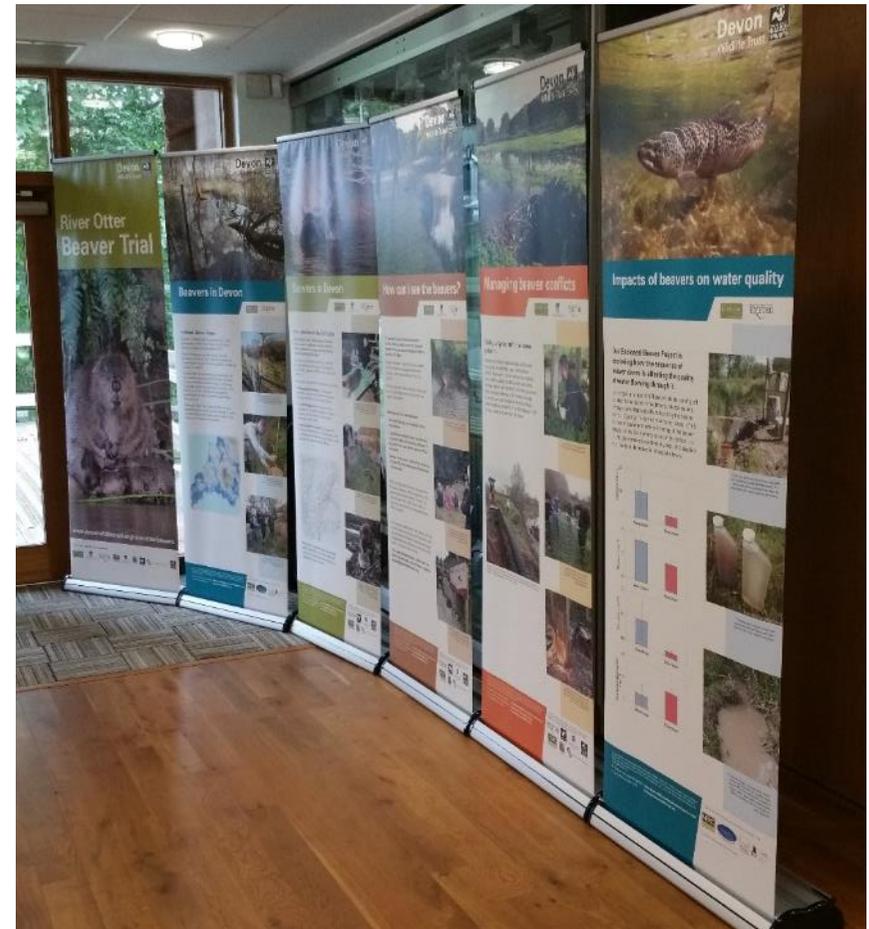
School children from local primaries have had beaver themed lessons and assemblies delivered by DWT and CDE education officers, and students from Bickton College and South Devon College have received talks about the beavers living nearby and many other local groups have requested them.

Over the course of the past 2 years, Godfrey Kent who runs an organisation called BUDFAS, has been working with local schools to write and produce a book called 'One of our beavers is missing.' This book was launched in Budleigh Salterton on 5th July 2017, alongside an amazing display of murals, and poems that the children have produced.

DWT has also supported the publication of two other children's books this year with information and photographs.

- Billy Beaver goes to tea by Jean White was published by Beaverworld publishing.
- The adventures of Charlie and Lottie – 'Paw Prints and Teeth' by Zoe Woodham and Jack Kirby was published by Aune Valley Publishing.

To support community events, a display made up of 6 pull-up banners has been produced which showcases the research being undertaken as part of the ROBT and the Enclosed Beaver Project.



River Otter Beaver Trial (ROBT) Third Annual Report – April 2018

List of talks and presentations given by ROBT partnership in 2017-18 with estimates for numbers of attendees

Date	Event	Attendees
05-04-17	CDE school group	100
12-04-17	Devon mammal Group - Rodent Roundup	40
13-04-18	Talk to Staffordshire University	17
14-05-17	Feniton senior citizens group	15
08-05-17	TWT Living Landscape Conference	80
18-05-18	Beaver Assembly	356
18-05-18	Beaver Assembly	362
18-05-18	Beaver Assembly	248
18-05-18	Beaver Assembly	360
30-05-17	Otter Valley Rotary Club	65
09-06-17	Beaver Assembly	200
11-06-17	Beaver Scout Day at Otterton Mill	126
12-06-17	Ottery St Mary WI	30
13-06-17	Sidmouth U3A	100
19-06-17	Devon Birds	14
19-06-17	Sidmouth cubs	24
20-06-17	Programme Information Day - update for staff, volunteers and trustees	50
22-06-17	Sidmouth cubs	30
27-06-17	BIAZA Native Species Working Group conference	50
27-06-17	Tipton Cubs	25
04-07-17	Budleigh Brownies	30
05-07-17	Budleigh Brownies	24
05-07-17	BUDFAS book launch - "one of our beavers is missing"	100
10-07-17	CaBA conference in Manchester	120
12-07-17	Beaver catchup for Stoke Hill Jnrs	32
12-07-17	Evening talk at Poundstock Gildhouse, Bude	35
18-07-17	Beaver talk to Yr 6	96
03-08-17	CDE Event	80
11-09-17	Friends of Poltimore Church Group	40
14-09-17	West Hill Garden Club	30
25-09-17	Littleham Primary School beaver event	27
27-09-17	RGS workshop on Large wood in river restoration	40

02-10-17	Lecture for Bicton College Students	18
05-10-17	ROBT Steering Group - numerous presentations	18
08-10-17	Sidmouth Science Festival	55
09-10-17	ROBT Fisheries Forum - numerous presentations	14
12-10-17	Beaver STEM talk	20
17-10-17	BMWG - presentation on conflicts in Otter to date and BRAT	14
23-10-17	Kingsbridge Natural History Society	30
25-10-17	ISCA Ladies Probus group	30
27-10-17	Royal Geographical Society Talk	50
02-11-17	EA FGB Webex presentation	75
08-11-17	South Devon College presentation	35
04-11-17	East Devon Breathe Easy group	28
14-11-17	Torquay Museum Society	83
21-11-17	BBOWT Chilterns Group	80
22-11-17	Skype session for children at school in Norfolk	30
23-11-17	Natural England Licensing conference	100
29-11-17	NottsBAG annual conference	120
30-11-17	Lecture at Bicton College	20
13-12-17	Newton & Noss Environment Group	60
24-01-18	Otter Valley Association	100
30-01-18	DWT Staff meeting	50
30-01-18	Bradninch beaver scouts and parents	85
01-02-18	Exeter College yr 12	49
03-02-18	Herpetofauna Workers Group Conference	150
06-02-18	Presentations to Avon River Keepers	12
14-02-18	Beavers: Friend or Foe - Newton Poppleford Probus	20
20-02-18	Presentation to Wessex Water Asset Managers	3
21-02-18	East Devon Green Party	40
08-03-18	Seaton Volunteer Group	60
09-03-18	Halsdon Local DWT group	25
10-03-18	Brandis Corner Wildlife Group	50
15-03-18	Local Nature Partnership conference - Resilient Wetlands workshop	40
27-03-18	Talk to Somerset WT. Wells group	50
	TOTAL	4560

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The **second ROBT update** was produced and disseminated in December 2017. This introduced Jake Chant, the new ROBT Field Officer to the local community. It also included features on the flow device installed at one site and on the coppicing activities of beavers compared with people.

Throughout 2017, various members of the ROBT team and stakeholders were involved with filming with Hugh's Wild West presented by Hugh Fernley-Whittingstall. This programme was broadcast on 27th January 2018, and included coverage of the trapping and tagging of one of the Otterton Kits, and interviews with Mark Elliott, Dr Roisin Campbell-Palmer, David White and Sylvia Mellor. Clips of the programme can be viewed here.

<https://www.youtube.com/watch?v=C1DK56tfi-Y>

The picture below shows Hugh Fernley-Whittingstall and Dr Roisin Campbell-Palmer releasing a newly tagged beaver that was filmed as part of Hugh's Wild West.



River Otter Beaver Trial: 2017 update  Devon Wildlife Trust

The River Otter beavers: now six family groups

This is the second newsletter we have produced to update the local community on the River Otter Beaver Trial. We are now in the middle year of the five year River Otter Beaver Trial and the beavers are thriving. At the start of this year we estimated there were 21 beavers living in six territories throughout the river system. Beavers give birth to their 'kits' in May, and we know that at least two of these families have given birth this year.

To find out more, and to receive regular e-updates on the Devon beavers, sign-up on our website www.devonwildlifetrust.org/river-otter-beavers

New Field Officer appointed

Devon Wildlife Trust has a new Field Officer working on the River Otter Beaver Trial. Jake Chant started working on the project in June 2017. Jake works part-time for Devon Wildlife Trust and will be out on the river working with landowners, our partners and volunteers. For any beaver related queries please email Jake on beavers@devonwildlifetrust.org. Mark Elliott remains the project lead but is now less frequently on the river.



Background to the Trial

In 2015, Devon Wildlife Trust was granted a licence to release two families of beavers back into the River Otter as part of a five year trial (2015-2020). We now know beavers have been living on the river since 2007, but they were captured by government officials in February 2015 to confirm they were healthy before they were passed to DWT for re-release.

The River Otter Beaver Trial is led by a partnership which includes Devon Wildlife Trust, Clinton Devon Estates, who own and farm much of the lower valley, and also the University of Exeter, who are co-ordinating the scientific research aspects of the Trial, under the expertise of Professor Richard Brazier. The University also employ Hugh Granam, a PhD researcher who is investigating the impacts of the beavers on the riparian (river) corridor.

A range of other specialists provide expertise on beaver ecology, handling, trapping and health screening, including Derek Gow, Dr Roisin Campbell-Palmer and Professor John Gurnell.

Gerhard Schwab provides a valuable international perspective. Gerhard co-ordinates the management of beavers in Bavaria where people and beavers have lived alongside each other for many years.

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Date	Broadcaster / publication	Heading / Focus of article
06-05-17	The Times	Busy Beavers shore up our defences
06-05-17	The Times online	Busy Beavers shore up our defences
03-06-17	Radio 5 Live	Piece with Richard Brazier about soil erosion and beavers
03-06-17	BBC Radio 4 - Today	Piece about results of enclosed trial
03-06-17	BBC Breakfast	Piece about results of enclosed trial
03-06-17	BBC News 24	Piece about results of enclosed trial
03-06-17	BBC website	Piece about results of enclosed trial
03-06-17	BBC Radio 2	News pieces by Richard Brazier
04-06-17	Daily Telegraph	Bring back beavers to prevent flooding
05-06-17	BBC Springwatch	Update on different British Projects including ROBT
03-06-17	xjsUS website	Bring back beavers to fight flooding and pollution
05-07-17	BBC spotlight x3	Beaver attack on dog
05-07-17	BBC website	Territorial beaver attack in Devon without warning
05-07-17	ITV news website	Warning to dog walkers after beaver attack
05-07-17	BBC Radio Devon	Piece on beaver attack
05-07-17	BBC Radio Cornwall	Piece on beaver attack
05-07-17	ITV local news	Piece on beaver attack
04-07-17	Devonlive.com	Dog could have been killed after beaver attack in Devon
05-07-17	The Times online	Owners told to keep dogs on leads after beaver attack
04-07-17	Exmouth Journal	River Otter Incident between dog and beaver...
04-07-17	Radio Exe	Piece on beaver attack
25-07-17	The Guardian	Notebook - Watch out - beavers about
25-07-17	The Guardian online	Why capitalists should connect nature
26-07-17	Mid week herald	Beavers scouts learn about beavers
01-08-17	East Devon news	Beavers meet beavers at Clinton Devon Estates
09-08-17	The Guardian online	Dam it - could beavers save Britain from flooding
09-08-17	The Guardian - G2	Dam it - could beavers save Britain from flooding
09-08-17	The Guardian	Forget the environment - fight for our living planet - George Monbiot
09-08-17	The Guardian online	Forget the environment - we need new words - George Monbiot
01-08-17	British Wildlife Mag	Beaver Bring Benefits (In Conservation News section)
16-09-17	The Guardian	Meet the latest recruit to the Flood Defence team - the beaver
16-09-17	The Guardian online	Meet the latest recruit to the Flood Defence team - the beaver
01-11-17	BBC Radio 4	Natural Histories Programme
30-10-17	Al Jazeera TV	Beavers claw out of extinction in UK
22-11-17	Express and Echo	Beaver numbers on river Otter treble
22-11-17	BBC1 Spotlight (late news)	Piece about beaver population
22-11-17	BBC Radio Devon	Beaver numbers piece
22-11-17	Western Morning News	Beaver numbers treble in two years
28-11-17	BBC1	Escape to the Country - piece about River Otter beavers
08-12-17	Gloucester live online	Michael Gove says yes to beavers
08-12-17	Miles King BLOG	Free the beaver: Michael Gove endorses releases of beavers
08-12-17	Buss Feed news	This is why reintroducing beavers into Britain is a good and important thing
13-12-17	The guardian online	UK to bring back beavers in first gov flood reduction scheme of its kind
22-12-17	The Globe and Mail (US)	Britain Bringing back the beaver
27-01-18	BBC 2	Hugh's Wild West
28-01-18	Permaculture Magazine	Working With Nature
12-02-18	BBC1 Points West - lunch	Boldventure project and the Forest of Dean
12-02-18	BBC1 Points West - evening	Boldventure project and the Forest of Dean
12-02-18	BBC1 Points West - late	Boldventure project and the Forest of Dean
12-02-18	BBC Radio Gloucestershire	Boldventure project and the Forest of Dean

The media coverage of the Devon Beavers was extensive in the last year. In total 50 pieces of media coverage explained the Trial and the research work that we are undertaking in Devon.

The highlights included:

- An update on BBC 2 Springwatch
- BBC 2 – Hugh's Wild West
- A feature on the BBC news network (Radio 4, BBC news 24 and website) by Roger Harrabin on the water quality benefits of beaves
- A 2 page spread in the guardian
- Pieces in The Times and Daily Telegraph about flood risk benefits
- Radio 4 Natural Histories programme
- BBC Radio 5 live and BBC Radio 2 about soil erosion and beavers
- BBC Points West local news
- Permaculture Magazine feature



Rozie Apps explains how beavers can create more resilient, flood and drought proof landscapes

Working with Nature:



The Beaver Way

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permaculture

Revealing Nature's Intelligence

It's been the increase in water on the river that was just a trickle of water flowing and a few ponds under upstream stress. By the end of March 2012 (around), there were eight large-scale areas of 900m² (0.60067), a building and creation of channels, streams flowing downstream, as well as more through the soil for flood risk management, in a constant trickle, which today. This important research has been in being enclosed by...

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EXPLAINED

THE TIMES - Saturday 11th 5 2017

If you have an animal story or news, please contact sharon.smith@the-wildlife-trusts.co.uk

Busy beavers shore up our defences

A study has found that the rodents' dams could help stop floods, says Sharon Smith

It may seem unlikely but had the flood that hit the UK last week, thousands of homes across the country may not have ended up flooded. A new report by Devon Wildlife Trust has found that beaver dams could help stop floods, says Sharon Smith. The report says that the rodents' dams are able to absorb flood water to prevent them from reaching pools and areas, thereby lowering the impact of flooding. The dams, constructed from mud and sticks, can absorb the water to prevent it from reaching pools and areas, thereby lowering the impact of flooding. The dams, constructed from mud and sticks, can absorb the water to prevent it from reaching pools and areas, thereby lowering the impact of flooding. The dams, constructed from mud and sticks, can absorb the water to prevent it from reaching pools and areas, thereby lowering the impact of flooding.

Beavers build hard-lined, multi-chambered lodges with underwater entrances, and ponds and canals at their disposal. They build their dams to raise the water level, to prevent the water from reaching pools and areas, thereby lowering the impact of flooding. The dams, constructed from mud and sticks, can absorb the water to prevent it from reaching pools and areas, thereby lowering the impact of flooding.

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Beaver!

Could beavers save Britain from flooding? In Devon, Patrick Barkham meets the mammal that has made a case for its permanent reintroduction by doing what it does best - water works

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OBJECTIVE 6: PROVIDE DATA AND EVIDENCE TO AUGMENT NATIONAL KNOWLEDGE BASE REGARDING BEAVER REINTRODUCTION

Principle Outcome: Environmental Assessment directly informs future reintroduction feasibility assessments and programmes.

Activity	2017/18			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Publish findings in technical journals and other specialist publications				
Hold open days at Devon captive beaver trial area for key stakeholders from the Otter valley and elsewhere				
Present research updates and results at local and national conferences				
Produce and disseminate nationally a final summary holistic assessment of the findings of the project and its relevance to the UK				
Publish beaver management recommendations to NE				

The sheer level of **demand for talks, walks and general information** about the Devon Beavers and the ROBT is an important finding of the Trial in itself. Any similar projects carried out in the future where beavers may be introduced into new parts of the Country, should include a large element of public engagement and education.

There are many myths about beavers which continue to be perpetuated in some of the media coverage, and there is a clear demand amongst many people and organisations for accurate information on which to base decisions about beaver reintroduction. For this reason, it has been essential for sufficient resources to be allocated to this type of work. As well as the local community engagement work outlined in chapter 5, much of the work now ongoing is with national organisations and stakeholders. As the Trial progresses into the final two years, ROBT partners have hosted and participated in conferences and events in different parts of the country with this aim.

Many groups of staff from the Environment Agency and Natural England have visited the two projects in Devon to see first-hand the impacts that beavers can have, the measures to maximise benefits and resolve conflicts that will be required if beavers are permitted to remain post Trial. In addition to the visits for Forestry Commission staff to see the Enclosed Project in March 2017, the Forestry and Woodlands Advisory Committee (FWAC) held a meeting at Bicton followed by a tour of the beaver activity in that area, which allowed a detailed discussion about the species and potential interactions with Forestry.

In December the Project team from the ROBT welcomed the Secretary of State for Environment, Food and Rural Affairs, Rt Hon Michael Gove who visited the River Tale release site. In addition to the Defra team, Neil Parish MP, and chair of the EFRA committee and Hugo Swire MP also attended. They were given a tour of the site and shown the impact that the beavers were having on the pond and scrub, as well as the River Tale itself.

The visit coincided with an announcement by Defra that licences would now be considered for other trials in England prior to the conclusions of the ROBT in 2020. Additional guidance on license applications was also issued by Defra. Recent announcements suggesting that the post Brexit agricultural payments would be linked more directly to the enhancement of natural capital are seen as a potential mechanism for incentivising landowners to make space for natural riverine processes and those enhanced by beaver activity.

A dedicated visit by the 'Defra family' beaver contacts also attended in November 2017 to discuss the outputs from the Trial, and in order to ensure the advice to ministers was based on accurate up to date information.

The EA Salmonid Working Group also visited in July 2017 as did a group from the Chartered Institute of Water and Environmental Management (CIWEM). On 2nd November, a Webex presentation was provided to the National FGB team of the EA.

The University of Exeter and Dr Roisin Campbell-Palmer are also taking survey techniques and population modelling from the River Otter and applying it in the River Tay catchment, partly in order to validate the ROBT findings on larger more established populations. ROBT partners are also involved in the Forest of Dean Project, and potential projects in Wiltshire, Essex, West Sussex, south Wales, Cheshire, Cumbria and Northumberland.

Professor Richard Brazier explains to the Secretary of State, the Rt Hon. Michael Gove how the scientists from the University of Exeter are monitoring the impacts of beaver dams on the hydrology and water quality. He was shown a beaver dam in the River Tale which has been instrumented as part of the PhD.



Many Wildlife Trusts in the UK are receiving requests for advice and information about beavers, and being asked to support local projects. As a result, many of these are having training events and presentations provided. A talk to the Nottingham Biodiversity Action Group (NottsBAG) annual conference, and a BBOWT Chilterns Group event attracted over 100 people each. The beaver work was also presented to a Wildlife Trust conference on rewilding held at the Knepp Estate in Sussex in May.

Following a presentation to the British and Irish Association of Zoos and Aquariums (BIAZA) Native Species Group conference in Paignton in June 2017, a group also visited the Enclosed Project in January 2018, and discussions are starting to be had about the role that UK zoos could play in captive breeding programmes and management of genetic variability.

Beaver impacts on wetlands and amphibians were presented to the Herpetofauna Workers annual conference in Northampton in February 2018.

For the second year, a group of student from The Royal Agricultural University at Cirencester visited the Enclosed Site to examine their behaviour in detail as part of modules in Countryside Management. The University of the West of England also visited the site, and Prof Jamie Lorimer from Oxford University also visited researching a book he is writing about rewilding.



In February a group of River Keepers from Wiltshire and Hampshire visited the River Otter to see the impacts for real. This was in response to discussions they were having internally that they recognised were not based on solid information, so they requested a fact-finding day which was a positive experience for all involved.

PARTNERSHIP DEVELOPMENT AND PROJECT MANAGEMENT

Principle Outcome: Nationally recognised flagship project developed, integrating local community ownership with latest scientific thinking. Project governance is inclusive and all partners have a sense of ownership over the outcomes.

Activity	2017/18			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Project Management Group to meet regularly to oversee implementation of project				
ROBT Steering Group to meet 6 monthly				
Raise funds for continuation of the project and specific areas of work				
Regular reports to Natural England as required by Licence conditions				
DWT internal Communications group to meet quarterly				
Science and Evidence Forum meeting quarterly and overseeing implementation of Monitoring Plan				
Community Engagement and Education Forum to meet annually as a forum for volunteers				
Fisheries Advisory Forum to meet as required, to guide fisheries research				
Secure MOAs with DCC, EA, NE and other Key Stakeholders as required				
Produce annual reports including Exit Strategy Trigger analysis				

The **Project Management and Governance** is continuing largely as envisaged early in the project.

The ROBT **Steering Group** met on 6th April and 5th October 2017, with the Project Management Group also meeting on the same days as well as informally communicating throughout the year.

A new **Beaver Management Working Group (BMWG)** was also established by the Steering Group to begin the process of writing a Beaver Management Strategy Framework that can be in place for the end of the Trial in 2020, should the beavers be permitted to remain in the catchment. They met on 17th October and 24th November 2017, 11th January, and 23rd March 2018.

The **Natural England Licence group** has met less frequently in the past year, as Natural England appeared satisfied with the progress of the ROBT and that the conditions of the license were being adequately implemented. They met on 16th January 2018.

The **Science and Evidence Forum** met on 12th June, 11th September, 11th December 2017 and 5th March 2018 to oversee the revision and implementation of the Monitoring Plan.

The **Fisheries Forum** met on 9th October 2017, after a considerable break since the first meeting.

The **Community and Education Forum** has not met this year, although it is envisaged they will do so in the summer 2018.

In June 2017 a new member of the ROBT team was employed by DWT. Mark Elliott reduced his hours to 3 days / week, allowing the **recruitment of Jake Chant as the part time Field Officer**. Jake is taking the lead on the landowner liaison side of the Trial, as well as the systematic surveys, volunteer co-ordination and guided walks on the River Otter.

Exit Strategy

The following procedures were outlined in the ROBT Licence Application:

A clearly defined Exit Strategy forms an integral part of the ROBT. The ROBT Project Management Group firmly believes that the project will be successful; however, an effective strategy for termination has been developed as a precautionary approach. The Exit Strategy would be implemented either during the trial in the event of insurmountable problems, or at the end of the trial in the absence of a firm commitment for beaver management in the long-term. The trial will be terminated at conclusion if there is clear majority objection from impacted stakeholders for the retention of the beavers. Any change in the rules governing management or limiting the ability of the project to manage the beavers will invalidate the trial and lead to the recapture of all the individuals at large. This process would reset the project and require a full project reapplication.

Procedures for Determining Exit

- The procedures for managing and delivering the Exit Strategy have been formally adopted by all ROBT Project Management Group partners and permanent advisors through Memoranda of Agreement. The procedures have been circulated to the Advisory Group for comment and amendments where appropriate.
- Exit Strategy triggers will be published and circulated to both the PMG and PAG. An annual determination will be made regarding whether specific triggers in the Exit Strategy have been, or have future potential of being reached. This determination will be informed by the publishing of an annual report that will detail beaver impacts and associated acceptability.
- The factors by which the Exit Strategy is assessed will be also reviewed on an annual basis by the PMG with advice and input from statutory and public authorities and the PAG.
- In the event of the exit being triggered all ROBT Project Management Group members and advisors will work in unison and without waver to remove all beavers from the catchment.
- Natural England and the Environment Agency would both be invited to attend all meetings (in an observational and advisory capacity) and be party to all correspondence relating to exit triggers. Natural England would authorise the implementation of the exit strategy as independent monitors of the trial.

The Exit Strategy as detailed in the licence application would be triggered in the event that:

1. Unsustainable and detrimental effects arise as a result of the re-introduction of beavers to the trial area;
2. Any significant change occurs to the required funding or management structure of the project that threatens the project viability;
3. There is unacceptable risk to human health, livestock or other wildlife;
4. There is an unsupportable level of mortality in released animals as a result of persecution, human intervention, or natural mortality attributable to the trial procedures;
5. The trial carries clear majority request for termination from impacted stakeholders;

Assessment against triggers on 31st March 2018

1. There have been a small number of cases of negative impacts resulting from the beavers' activities, that are being dealt with in line with the Management Strategy. All impacts are considered to be at a low level and are being managed effectively.
2. Funding for the remainder of the Trial is fairly secure, although funding gaps remain.
3. A minor risk factor for human health is highlighted by the RTA. No animal health issues have been identified.
4. There has only been one recorded mortality, and the population is growing well, and not subject to any obvious pressures.
5. There has been no request for the trial to be terminated by any of the impacted stakeholders.

On 19th April 2018, the ROBT Steering Group met and concluded there was no reason to trigger the Exit Strategy at this time.