

River Otter Beaver Trial Fourth Annual Report

April 2019



Beaver created wetland in an area of floodplain pasture near Otterton

River Otter Beaver Trial (ROBT) Fourth Annual Report – April 2019

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 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. The Environment Agency and Wessex Water have funded additional research work associated with the Trial, and Defra have contributed towards the production of the Beaver Management Strategy Framework (post 2020).



Key Headlines from River Otter Beaver Trial (ROBT) - Year 4 (ending March 2019)

- The five-year River Otter Beaver Trial is now entering its final year, and the emphasis is on the completion of the research work, and the development of the outputs for government. The compilation of the Science and Evidence Reports has begun, and these will be published toward the end of 2019/20, containing seven main areas of work that are outlined in the ROBT Monitoring Plan.
- The population size of beavers on the River Otter is becoming increasingly difficult to assess accurately, but based on the most recent winter survey combined with trapping data from 2019, we are able to confirm seven breeding pairs, and a further six locations where a focus of feeding behaviour suggests one or more resident animals maybe holding a territory. With many young animals in the population, there are likely to be a number of singletons in this second category.
- A second beaver mortality was detected in 2018/19, and the body recovered from Chesil Beach. Although it was confirmed as originating from the River Otter, the body was too decomposed to provide any useful information.
- The ROBT Steering Group are preparing for scenarios where the beavers are permitted to remain on the river beyond the end of the Trial and are producing a Beaver Management Strategy Framework that outlines how beavers could be managed in the River Otter. Following six full-day sessions by the Working Group, this document is nearing completion and will be published in summer 2019.
- As they colonise new areas of the catchment, the opportunities to study their impacts and interactions with existing land-use and river users are increasing. Where issues are raised, often through the 'beaver hotline' email address, a rapid response is provided, with advice and support to resolve any impacts.
- Where concerns about beaver feeding on large trees are raised, fencing and sandy paint are being used to protect those trees. Riverside orchards are high risk areas and proactive work with orchard owners / tree nurseries is ongoing.
- A Protocol for Passage Assessment of Beaver Dams (The PAD Protocol) has been developed to guide the manipulation of beaver dams to aid fish passage during the autumn fish migration season.
- As part of the preparations for scenarios where beavers are permitted to remain in the wild on the River Otter, the stakeholder engagement work has become particularly focused on those key stakeholders that may have a role in the future management of beavers and their effects.

- The astonishing levels of interest in beavers and their ecology and management continues to generate a large number of opportunities to speak to stakeholder groups and provide information. A further 90 beaver events / presentations were provided in 2018/19, engaging with around 4,000 people. This brings the total for the whole Trial to 352 events to approximately 16,000 people. Many of the presentation attendees come with genuine questions and concerns - the provision of accurate information and 'myth-busting facts' is a very important part of addressing these concerns.
- In January, the ROBT 2018/19 Update was published, which has a particular focus on beaver dams, water quality and living with beavers.



Beaver dam and lodge on one site off the main river

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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 an additional, more scientifically controlled, site to study the impacts of beaver dams on water and ecology, 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 2018/19. For many activities the work is ongoing throughout the trial and the colours reflect this. Some lines are blank because there was no work programmed for this year in the original Work Plan. The progress is 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	2018/19			
	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				

Under the chairmanship of Professor Richard Brazier, the Science and Evidence Forum (SEF) continues to oversee the implementation of the ROBT Monitoring Plan. In January 2019, they began the collation of the final ROBT Science and Evidence Report that will be published towards the end of 2019/20. This is a major piece of work that will see the publication of a summary report that covers all research aspects of the Trial that are being undertaken, as well as a series of case studies containing more detail about individual sites.

Many of the major areas of research continue to be undertaken as part of the two PhDs that are being carried out through the University of Exeter.

Roger Auster's PhD aims to examine the socio-economic implications of reintroducing beavers to England, encompassing both potential benefits and costs from the impartial perspective. Some of the research that has so far begun within the River Otter Beaver Trial includes (but is not limited to) the following:

- A mail-return questionnaire was issued across the community in Otterton in order to explore the potential impacts of the presence of beavers on the use of the watercourse, visitors to the area, local business and 'beaver-watching' behaviour. A good return rate (22.89%) was received and analysis is now underway.
- A study has begun exploring the views held about beaver reintroduction by members of the angling community on the Otter. This research uses a method known as the Q-Methodology which seeks to identify and compare the different perspectives that are held within the context of the study.
- Interviews have been taking place with land- and property-owners within the River Otter catchment who have experienced the impacts of beavers on their property.
- The PhD student is exploring the potential application of agricultural consultancy data in estimating the potential impact of beaver damming on productive land.
- Further research is planned to take place, including into the economic impacts of beavers on water flow attenuation and local businesses.

Hugh Graham's PhD focuses on the impacts on the Physical Environment and includes the development of the Beaver Dam Capacity (BDC) model which seeks to understand where beavers are able to build dams based on the physical attributes of the stretch of watercourse in question. By combining this information with other datasets, it is also possible to identify:

- those areas at greatest risk of conflict; and
- where beaver dams could be utilised to generate ecosystem service benefits, such as slowing flows and reducing flooding downstream.

Although the model has been run and validated for the Otter catchment, it has wider application, and has also been validated in other areas where beavers exist such as the Tay/Earn catchments in Scotland. Model performance has been found to be very reliable in locations where dams have been constructed to date.

Hugh's PhD also includes the following:

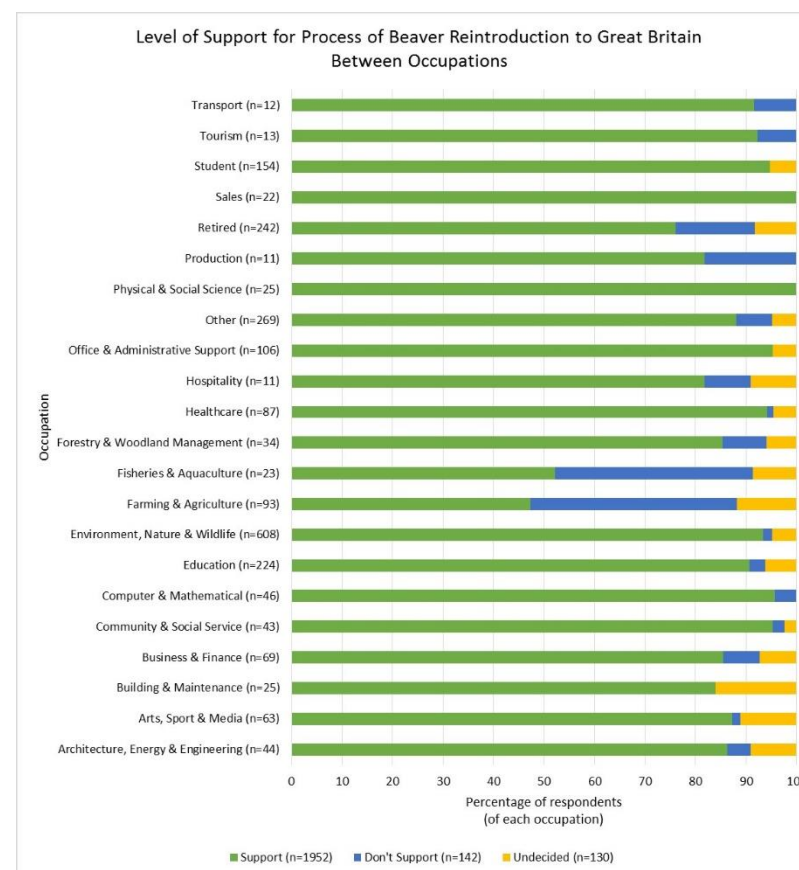
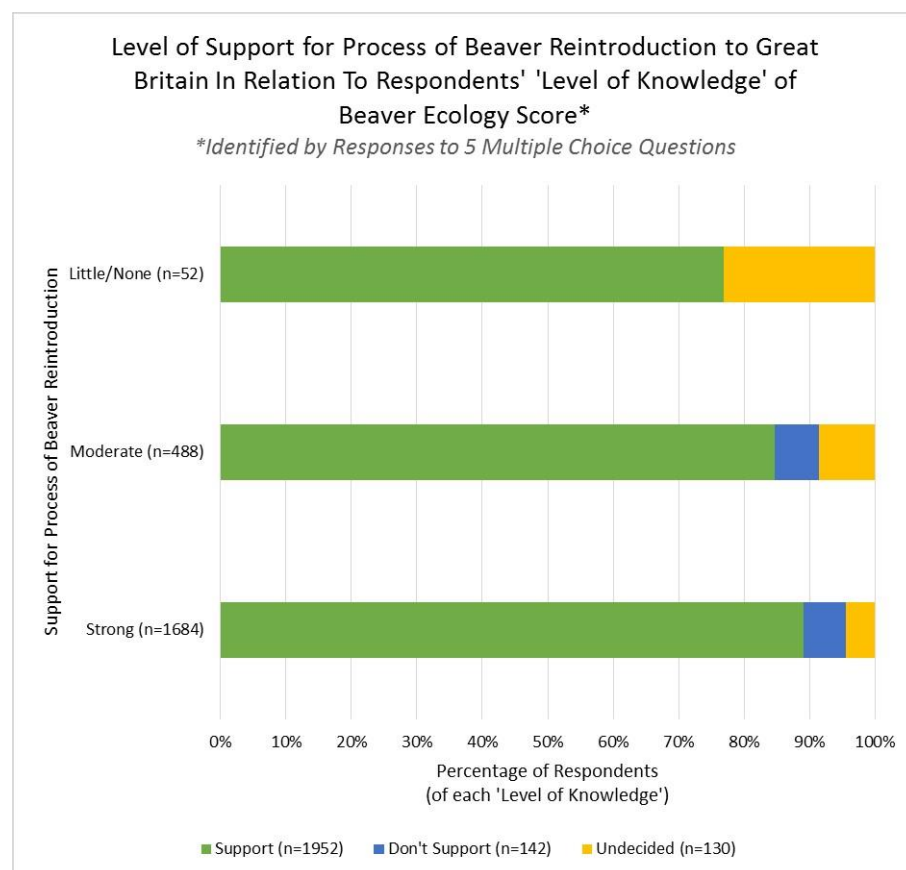
- **Beaver Vegetation Index (BVI)** - The BVI has been developed using nationally available spatial datasets to determine the suitability of vegetation for beaver in a given area to a resolution of 5m. This model was developed for the River Otter and Tay catchments and has now been deployed nationally as part of a joint Environment Agency/Natural England Project.

- **Hydrology** - Hydrological monitoring has continued across the catchment but is focused on three sites in the Tale and in the area around Otterton. Due to fundamental changes in the hydrology of the Bicton Brook, caused by upstream channel modifications for agriculture, monitoring equipment has now been removed. Historical data from the gauging station at East Budleigh has been obtained from the Environment Agency and preliminary analysis has revealed that there are observable differences in the hydrological function of the site following beaver occupancy. Data for winter 2018-19 is to be requested in order to complete the analysis in due course.
- **Riparian Vegetation Structure/Drone flights** - All field work for this aspect of the project has now been completed with a further 4 drone flights having been undertaken on the Tale this year. Processing this data has begun and we propose to use the derived point cloud data to determine the extent of hydrological change and the change in riparian vegetation structure.
- **Riverine Macroinvertebrates** - All invertebrate samples have now been collected with the final samples being completed in spring 2018. Identification of the taxa to species level is currently underway. This data will be used to determine the impact of beaver dams on macroinvertebrate communities and fine sediment deposition.
- **Beaver Population distribution / Feeding sign Analysis** - Data for all feeding sign surveys have now been collated and processed. In total 87kms of watercourse were surveyed between January and March 2019. Derived kernel density plots of the feeding signs provide valuable information regarding the distribution of the beaver population on the R. Otter and can serve as a valuable tool from which to estimate the number of territories present.

Hydrology monitoring equipment has been installed upstream of Otterhead Lakes in the headwaters of the catchment. This was funded by Wessex Water, the owners of the reservoir and the Environment Agency in order to help quantify the effects of the beaver dams in the water entering the drinking water reservoirs.



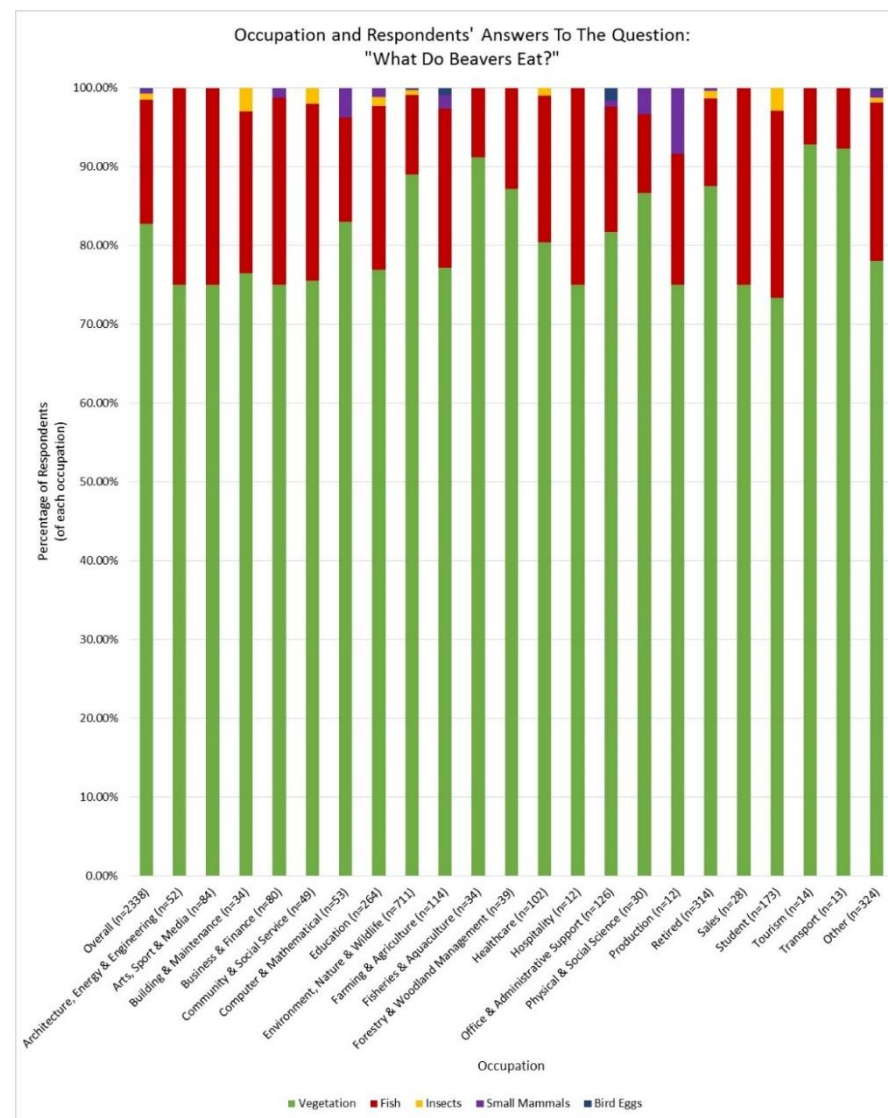
In early 2017 a detailed **public perception survey** was carried out by Roger Auster at the University of Exeter, prior to the start of his PhD. This was conducted on-line and a total of 2,759 people responded to it. As a result, a paper has been submitted to the journal *Area*, and is going through the peer review process – with publication expected in the next few months. Some of the initial results are illustrated here.



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In order to quantify the level of expertise that the respondents have regarding beavers, the participants were asked five questions about their biology and ecology. These are outlined below. One of the questions 'What do beavers eat?' provides a useful insight into the proportion of people that believe beavers are fish eaters (16.3%). This can be broken down further into different stakeholder groups, by occupation.

QUESTION	CORRECT/INCORRECT	MULTIPLE CHOICE ANSWER	%
Which of the following animals is a beaver? [Images] (n=2692)	Correct	Eurasian Beaver	97.85
		Otter	1.11
	Incorrect	Pine Marten	0.89
		Harvest Mouse	0.15
Where do beavers live? (n=2736)	Correct	Lodge	72.99
		Dam	22.62
	Incorrect	Holt	3.22
		Sett	1.13
		Cave	0.04
What are baby beavers called? (n=2719)	Correct	Kit	80.91
		Pup	11.11
	Incorrect	Cub	7.25
		Kid	0.48
		Calf	0.26
What do beavers eat? (n=2742)	Correct	Vegetation	82.13
		Fish	16.37
	Incorrect	Insects	0.73
		Small Mammals	0.58
		Bird eggs	0.18
What type of mammal is a beaver? (n=2734)	Correct	Rodent	78.90
		Mustelid	14.52
	Incorrect	Marsupial	4.28
		Carnivora	2.27
		Feline	0.04



Beaver dams within the River Otter catchment

At the start of the ROBT, concern was raised that the impacts of the beavers would not be significant enough to allow a meaningful study into their effects and interactions with existing land-uses. This was primarily because the two family groups of beavers had been confined to the deeper parts of the catchment where they hadn't needed to construct dams. However there are now approximately 13 territories within the catchment, with at least seven of those containing breeding pairs. Beaver dams have been constructed in five of the sites with breeding pairs. The dams are hugely variable, depending on the geography of the territory. In smaller watercourses with shallow gradients, including in heavily modified channels / drainage ditches, these dams may be more stable and persistent. In these locations, they have more potential to cause conflict with existing land-uses.

Where they are constructed in large or faster flowing streams, they are often more ephemeral and can be washed out during seasonal high flows. These vary in size and construction considerably, and it has proved difficult and time-consuming to keep track of these dams as they come and go. Where significant dams are constructed and persist, the Environment Agency are informed in accordance with a Memorandum of Understanding.



In October, a summary of the River Otter beaver dams was attempted. It was concluded that 26 dams were in place at that time, but that approximately 80 had been constructed since the start of the Trial at 55 exact locations on seven different landholdings.

In March 2019, another brief snapshot was taken, including a rough estimate of the impounded water. It was estimated that nine dams were in place in watercourses (excluding retaining earth bunds and dams constructed in wetlands off the main channels). 2,400m of watercourse are currently impounded by dams, (including 1,700m of drainage ditch on one site). Out of a total of 594kms of watercourse in the catchment, this equates to 0.4%.

These before and after pictures show how a temporary beaver dam has created perfect conditions for spawning fish as it washed out in winter floods

<https://www.youtube.com/watch?v=bj8ceif1Oy8>

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				

In the summer of 2018, a group of eco-tourists on holiday with the company Wildlife Travel came to Devon to visit the beaver sites, and to learn more about the project. They were introduced to the area around Otterton and to another site upstream where they were successfully able to watch beavers.

Active support for responsible tourist operators has always been one of the aspirations of the Trial, but the mobile nature of the beavers, has made it hard for businesses like this to guarantee sightings, and to plan itineraries around them.

Other aspects of this Objective are ongoing and included within the two PhD's outlined above.



Wildlife Travel customers were taken beaver watching as part of their itinerary in 2018

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				

Beaver hotline and complaints received

DWT continues to operate rapid response to any issues that are raised via the beaver hotline. As well as responding reactively to issues raised, proactive tree protection is also commonly used to avoid conflicts arising, and ROBT staff are becoming more experienced in predicting these.

In the course of this year, concerns have been expressed in connection with trees on three sites.

On one site; a small riverside orchard, some of the trees had previously been proactively protected, but the beavers felled an unprotected apple tree, as well as a wisteria growing over a bridge that had sentimental value. These trees have now been protected using tree guards and electric fencing, but the visual and amenity impact of these protective measures is still of some concern and work here is ongoing to agree the best solution.



The visual and amenity impact of these tree protection measures have been raised as an issue by the landowner



In discussion with the landowner, it was decided to protect this tree to avoid impacting on adjacent powerlines.



Beavers do appear to feed on ornamental weeping willows that have been planted deliberately on riverbanks. In this case, the owner put a poster up expressing concern about the beaver re-introduction.

Impacts on Land Drainage

The River Tale is the major tributary of the River Otter that joins the river just north of Ottery St Mary. This is a medium sized watercourse that appears to be suitable for beaver dams to be built in places, particularly during drier periods such as were experienced during the summer of 2018. Dams are sporadically constructed but are commonly washed away during high flows. However, on one site, concerns were raised in 2018 about the presence of a summer dam, and the impact this was having on land-drainage in the surrounding floodplain. The dam was repeatedly removed, and the beavers ceased rebuilding as the conditions changed in the Autumn, but the landowners in this area remain concerned about the presence of the beavers. This site is providing a good opportunity to understand the nature of some of the conflicts that beavers can bring, including issues between neighbours that have different perceptions and levels of tolerance of beaver activity.



This dam on the River Tale was built during the low summer flows to enable to beavers to gain access to a riverside maize crop. It was impacting on the land-drainage of the low lying fields, and was removed by ROBT at the request of the landowner.



A beaver dam near Otterton is raising water levels in a road-side ditch and has caused some water to stand on this adjacent country lane. It is thought that this beaver dam is however reducing flood risks to a community downstream.

Between 24th and 27th April, a group of 5 people from various organisations including University of Exeter and Forestry Commission joined a **fact-finding trip to Bavaria**, hosted by Gerhard Schwab and Derek Gow. The group met with representatives of regional organisations involved in agriculture, water management, local residents, a town mayor and a biodiversity officer. The group also met with Bavarian beaver volunteer consultants and learned about management practices that had taken place at a number of sites. This picture of one of the visited sites shows an approximately 10 year old beaver wetland adjacent to agricultural fields.



Beaver-created wetland in farmland in Bavaria.

Beaver Management Working Group

In preparation for the scenario that the beavers are permitted to remain in the River Otter after the end of the Trial in 2020, the ROBT Steering Group convened a Working Group to oversee the production of a Beaver Management Strategy Framework (BMSF) for the River Otter. This Working Group brought together a team of national beaver experts, representatives of the statutory sectors, conservation and land management, non-governmental and charitable organisations, land and property owners, and other river user representatives. The inclusion of organisations within the Working Group with national remits recognised the national relevance and importance of this document and the potential for it to be adapted for other catchments where appropriate.

The Group was established in October 2017 and have now met for six day-long sessions. The workshop discussions were comprehensive and robust, but at all times have been conducted in a constructive, inclusive and consensus building manner. The approach we have adopted recognises that it is helpful to consider beaver colonisation of a catchment in three key phases from early establishment, through to building and then maintenance phases. The conservation status, and resilience, of the population should increase over time which in turn will influence the nature, intensity and suitability of differing management interventions. This BMSF is tailored to the building phase and indicatively applies to the period 2020 to 2030.

The BMSF builds on the ROBT Management Strategy that was produced at the start of the Trial in 2015, and the associated risk assessment. The experiences gained of conflicts throughout the Trial, and how they can best be resolved have been a vital part of this work. By the end of March 2019, a draft Beaver Management Strategy Framework had been produced which will be presented back to the Steering Group in April. If this document is commended by the Steering Group, it would then be published, and disseminated more widely, as a potential model that could be applied in other catchments where beavers are colonising.



The ROBT Management Strategy continues to function well for the period of the Trial, and so further revisions have not been necessary.

One of the key elements of the proposed Beaver Management Strategy Framework is the development of a new Environmental Land Management Scheme that enables landowners to be rewarded for the provision of Ecosystem services provided by the beavers. Existing schemes do now allow for the unpredictable nature of beaver activity, and a new scheme could include a significant buffer alongside watercourses that would help mitigate many of the conflicts that may occur with existing land-uses and fisheries, and provide the space for new wetland habitats to be created.



Some conflicts are easier to detect than others

The management of fisheries conflicts

One group of stakeholders that have raised significant concerns about beaver re-introduction are the angling community. While the science remains complex and the impacts of beavers on fish populations at a catchment scale may well be positive, both nationally and locally, anglers continue to raise concerns about perceived negative impacts primarily on migrating salmonids such as sea trout and salmon. It is important that these concerns are properly considered and addressed where possible.

On 10th July 2018, a workshop was held with the recently formed River Otter Fisheries Association to consider the subject in detail. One of the main proposals to come out of this workshop was to develop a protocol for managing this perceived conflict which might be used in key locations where local anglers wish to take action to assist fish passage. An existing methodology for assessing barriers to fish passage was suggested as appropriate to use, and in September 2018, DWT commissioned Westcountry Rivers Trust to adapt this methodology to assess beaver dams for their passability. Following field trials on beaver dams in 3 reaches in October, the developing protocol was presented to the ROBT Fisheries Forum on 31st October for their consideration.

The final Protocol for **P**assage **A**ssessment of Beaver **D**ams (The PAD Protocol) was proposed in a final report published in February 2019, and is based around a flowchart that takes the user through key factors that influence the ability of different fish species to negotiate an obstacle in the watercourse, suggesting strategic interventions that will allow passage past the dam. The protocol is only designed to allow short term interventions to enable fish passage at key periods. This reflects beavers' behaviour as they are likely to repair dams quickly but it will represent a useful tool where key watercourses for fish passage have obstacles remaining during autumn high flow events.

This protocol was then presented to the AGM of the River Otter Fisheries Association on 20th March 2019 and will be further refined as the opportunity arises. The AGM was also presented with the ROBT 2018/19 update newsletter which included a number of features on the interaction between beavers and the angling community. One of the items that the ROFA had requested was some text about the perceived risk of anglers being in the water with beavers during the summer evenings. This followed an account of an angler feeling intimidated by a beaver 'tail-slapping' nearby.



Scott West (WRT) assessing dam passability by fish

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 summer of 2018, was not particularly productive for beaver sightings. At the current time, the beaver population is still relatively small and mobile, and we are still seeing significant movements of family groups and individuals. This has been particularly apparent in the areas where people have become quite accustomed to getting very good views. During the summers of 2014 and 2015, the yellow tagged female beaver (and her family) was resident just north of Ottery St Mary, and then in summers of 2016 and 2017, the pink tagged female provided excellent views just north of Otterton. In both cases, these families subsequently moved off into other stretches of the river, making it harder to see them. Maps of sightings are therefore no longer thought to represent a useful way to present distribution data.

As part of a new initiative to assess the number of kits born to different family groups within the catchment, and to increase the capacity of volunteers able to support the Trial, a series of co-ordinated summer evening surveys were held in 2018. Basic training was provided, and volunteers were paired up and assigned different territories to watch, and the results then collated. One issue that has occurred in doing this, is the inability to feed back to volunteers and others on the location of the different beaver families in order to maintain the confidentiality of some landowners. There is considerable public interest in the status and location of the beaver population, not least from those assisting with monitoring them, but at least two key landowners have requested the location of their sites remain out of the public domain, preventing the sharing of maps.

The last annual trapping and tagging of beavers has taken place in winter 2018/19. As well as tagging some of the new kits born on the river during the Trial period, a repeat of more detailed health screening has occurred, allowing the health status to be compared with that from the start of the Trial in 2015. The results will allow zoologists to assess which diseases and parasites the beavers have been exposed to in the environment, and also better understand how well the beavers are settling into the catchment. The findings of this work will be presented in the end-of-Trial Science and Evidence reports.

Reintroduction of new animals

At the start of the Trial DWT was granted a licence to release an additional five beavers into the catchment in order to enhance the genetic diversity of the population, and reduce the risks of inbreeding. In May 2016, one pair was introduced into the River Tale sub-catchment, and we are still seeking an opportunity to introduce additional animals where possible. However a moratorium on the release of all beavers that was put in place in the autumn by Defra due to perceived risk of introducing the parasite *Echinococcus multilocularis* prevented release at that time. However proposals to translocate beavers from conflict zones on the River Tay, where they are free of the parasite has since been accepted, and so options will continue to be explored to release until the end of the Trial.

On the 15th February 2019, DWT was contacted by the Dorset Wildlife Trust that run Chesil Beach Centre to report that a dead beaver had been washed up on the eastern end of Chesil beach near Portland (NGR SY 67600 74200). The body had been in the sea for some time and was in a very degraded condition. Although it didn't have a PIT tag, it did still have one of its ear tags, and this tag has been confirmed as originating from the ROBT. However, with this single tag and the lack of PIT tag we are only able to narrow it down to one of five beavers. F0519, F3102, M6734, F6183, F0000. The width of the tail (125mm) is consistent with a young (2yr old?) animal.



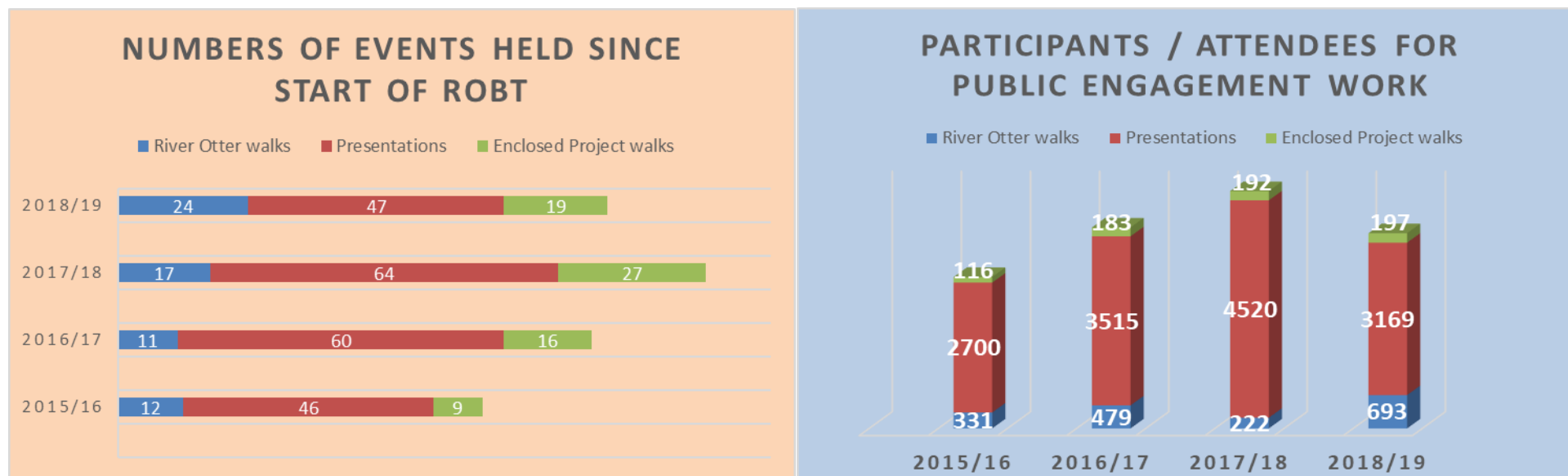
The remains were given a basic post mortem examination by New Street Vets in Honiton but there was very little of the animal left. Whether the animal swam out of the mouth of the river in an attempt to disperse, or died in the river and was washed out during high flows, is impossible to determine.

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				

Talks and presentations given by ROBT partnership in 2018/19



A further 90 beaver events / presentations were provided in 2018/19, engaging with around 4,000 people. This brings the total for the whole Trial to 352 events to approximately 16,000 people. Many of the attendees to these presentations come with genuine questions and concerns and in many cases we try to capture these before the event begins. The provision of information and 'myth-busting facts' is a very important part of addressing these concerns which can often be alleviated easily. Repeat questionnaires after information has been provided is a way of understanding the success of this area of the Trial (see P29 below).

As part of the preparations for the conclusion of the ROBT, and the scenario for the future that permits the beavers to remain in the wild on the River Otter, the stakeholder engagement work has become particularly focused on those key stakeholders that may have a role in the future management of beavers and their effects. Capacity building within these organisations will become increasingly important to prepare for this scenario after March 2020.

River Otter Beaver Trial (ROBT) Fourth Annual Report – April 2019

The Forestry Commission visited in April and May 2018, and in February 2019. This including the FC Staff Environment Conference which was held in Exeter, and the ROBT team provided a day of field visits to the River Otter and the Enclosed Beaver Site where the issues around management were outlined. The FC Wildlife Managers group then visited the River Otter in May, and the Senior Managers Group attended the same area in February 2019.

Various teams from the Environment Agency visited the Devon beaver sites in April, June and October 2018. These including teams with a natural flood management remit where beavers are considered to play a potentially important role.

Natural England staff also visited the sites in April 2018 and January 2019, and the Devon County Council Environment Team visited the Otterton area in July 2018, with a presentation followed by a guided walk.

Other key stakeholder groups including the NFU and CLA also visited in July and October respectively, and a presentation was provided to the Royal Institute of Chartered Surveyors (RICS) Devon and Cornwall branch on 9th November.

With the longer term in mind, a short update about the Beaver Trial was provided to the Catchment Communities Conference held at the Deer Park Hotel on 19th October which the East Devon Catchment Partnership had convened to discuss a range of issues relevant to stakeholders in the area.

On 20th November, the Royal Agricultural University, Cirencester held a Rewilding conference, at which the beaver re-introduction Trial was presented alongside other projects such as pine martens in the Forest of Dean, and the work at Knepp Estate in Sussex. This was a large conference with a wide range of different perspectives represented, and allowed a detailed discussion on many of the wider issues.

Visits by other Wildlife Trusts and from a number of different National Trust teams have allowed those interested in developing projects to visit Devon and see the projects first hand, enabling a better understanding of fencing requirements, and long-term beaver management implications to be explored.



River Otter Beaver Trial (ROBT) Fourth Annual Report – April 2019

River Otter Field Visits		attendees
11/04/2018	Tour of site to discuss beaver dams and FD implications	5
12/04/2018	Guided walk on River Otter for FC conference	30
18/04/2018	Tour of Otter with Hampshire NE	10
01/05/2018	U3A Tour of area	25
10/05/2018	Tour of site for FC Wildlife Managers	12
17/05/2018	Natural England Directors and Area Managers	18
10/06/2018	CDE Open Farm Sunday	250
20/06/2018	EA group visit -Flood and Coastal Risk Management Officer	15
29/06/2008	EA Fisheries visit	6
08/07/2018	walk/talk Seaton Scouts	20
10/07/2018	Beavers and balsam - talk and practical task with Kings School	18
17/07/2018	NFU Environment Team	15
18/07/2018	Dorset WT visit	12
20/07/2018	DCC Environment Team	20
30/08/2018	Ottertton Mill Beaver day	120
01/09/2018	Waggy Walk	26
03/10/2018	EA NFM meeting	11
04/10/2018	EA NFM meeting	5
18/10/2018	Site visit with CLA	10
31/10/2018	Fisheries forum field visit	10
17/01/2019	National Trust North Exmoor team	11
29/01/2019	Systematic survey - training event for Escot Education team	8
26/02/2019	Visit with Forestry Commission board and staff	19
06/03/2019	Purbeck National Trust and stakeholder Group	17
TOTAL		693



Richard Brazier explains the effects of this beaver dam on the hydrology and geomorphology of the Budleigh Brook to a group of National Trust staff in January 2019.

River Otter Beaver Trial (ROBT) Fourth Annual Report – April 2019

Presentations		attendees	location	ROBT staff
06/04/2018	Presentation to to Adur Beaver Partnership	8	Knepp Estate, Sussex	ME
10/04/2018	Presentation to Small Population Management Conference	50	Chester University	ME
10/04/2018	Poster Session at European Geophysical Union (EGU)	150	Vienna	HG
11/04/2018	Poster Session at European Geophysical Union (EGU)	150	Vienna	HG
11/04/2018	Forestry Commission Conference	100	University of Exeter	RB
17/04/2018	DWT Project Information Day	50	Riverside Centre, Exeter	ME
19/04/2018	ROBT Steering Group - update presentations	15	CDE Boardroom	PB / ME / JC / RA
10/05/2018	Presentation to FC Wildlife Managers	13	CDE Boardroom	ME
16/05/2018	Presentation to Somerset Badger Group	30	Secret World Wildlife Rescue	ME
16/05/2018	Natural England Directors and Area Managers	18	Otterton area	PB
17/05/2018	Stand at Devon County Show	300	Devon County Show	JC / JA / EPF
05/06/2018	Talk to Sidmouth Probus	30	Blue Ball Inn, Sidford	ME
22/05/2018	Re wilding Lecture by Prof Alastair Driver (including ROBT info)	500	Exeter University	AD
21/06/2018	Presentation to EA Stakeholder Engagement team	15	Cookworthy Forest Centre	ME
27/06/2018	Presentation to Sidmouth Probus (women's) Group	50	Sidmouth	SH (DWT)
10/07/2018	Broadhembury WI	45	Bradhembury Village Hall	JC
10/07/2018	River Otter Fisheries Association - workshop	10	Alastair Rogers house	ME / RB / HG
17/07/2018	NFU Environment Team presentation	15	CDE Boardroom	ME / PB
18/07/2018	Dorset WT Staff - presentation	12	Cookworthy Forest Centre	ME
20/07/2018	DCC Environment Team presentation	20	Otterton Village Hall	ME
02/08/2018	Stand at Honiton Agricultural Show	100	Honiton showground	JC / Tom Buckley
18/09/2018	8th International Beaver Symposium	100	Denmark	HG
19/09/2018	8th International Beaver Symposium	100	Denmark	ME / AP
09/10/2018	East Budleigh and Bicton WI	40	East Budleigh Village Hall	ME
11/10/2018	ROBT Steering Group - update presentations	12	CDE Boardroom	ME / JC
12/10/2018	Taunton Fly Fishing Club	30	Candlelight Inn, Bishopswood	JC
15/10/2018	Rewe Gardening Club	40	Rewe Village Hall	JC
18/10/2018	CLA Devon and Cornwall Policy Committee	12	CDE Boardroom	ME
19/10/2018	East Devon Catchment Partnership event	80	Deer Park Hotel	ME
23/10/2018	Shropshire Wildlife Trust meeting re River Wye	20	SWT Offices, Shrewsbury	ME
25/10/2018	Harpford Village Hall Committee	40	Harpford Hall	ME
31/10/2018	ROBT Fisheries Forum - update presentation	18	CDE Boardroom	ME
06/11/2018	Beaver Advisory Committee for England	50	Knepp Estate, Sussex	ME
09/11/2018	RICS Devon and Cornwall Autumn Seminar	80	Eagle House Hotel, Launceston	ME
20/11/2018	Re wild life Conference	260	RAU Cirencester	ME
17/01/2019	National Trust North Exmoor team	11	CDE Boardroom	ME / RB / SB
23/01/2019	Escot staff and NE Trainees and 2 new NIA staff	15	Cookworthy Forest Centre	ME
11/02/2019	Hatherleigh Rotary Club	15	The George, Hatherleigh	ME
13/02/2019	Sidford WI	50	Sidford Social Club	ME
20/02/2019	Dorset WT Local group	50	Fontwell Magna	JC
22/02/2019	Beavers - Friend or Foe' at Teignmouth Science Café	50	Teignmouth Science Café	KP (CDE)
26/02/2019	Forestry Commission Executive board and local field staff	19	Bicton College campus	ME / PB
05/03/2019	Bicton lecture to students	30	Bicton College campus	JC
06/03/2019	Purbeck National Trust and stakeholder Group	16	Cookworthy Forest Centre	ME / DG
17/03/2019	Bicton Lambing Sunday	300	Bicton College campus	KP (CDE)
20/03/2019	River Otter Fisheries Association - AGM	25	Deer Park Hotel	ME
22/03/2019	Educational river visit	25	Otterton Primary School	KP (CDE)
TOTAL		3169		



Presentations have been provided to a wide range of audiences from local groups such as U3A, Probus etc to International Conferences such as the 8th International Beaver Symposium held in Denmark in September 2018 (above)

Events questionnaire

In order to gather information regarding the perceptions of different stakeholder groups, and the efficacy of ROBT presentations in providing accurate information on beavers and their management, a short questionnaire is distributed to many of the audiences that invite us to speak. Attendees are asked to complete 4 simple questions before the talk starts, and there is space for them to express questions that they have at that point.

They are then asked the same questions at the end, and are asked whether their issues have been addressed by the information provided – as well as a question about the quality of the talk. By the end of the year, over 650 questionnaires had been completed and these are currently being analysed by the University of Exeter.

Beaver perceptions - before talk

The River Otter Beaver Trial is a five year project to assess the impacts of the beavers living wild on the River Otter. At the end of the Trial, the government will decide whether the beavers can remain in the wild, and whether beavers will be allowed back into the wider English landscape.

We are attempting to understand perceptions of beavers and how they change when people are presented with more information. Please help us by completing this side of the form before the talk, and then the other side, at the end of the talk. This is entirely voluntary though. Many thanks.

Indicate the strength of your opinion with an 'x'		
Beavers are beneficial for wildlife	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Beavers are not beneficial for wildlife
	Most beneficial no opinion / don't know least beneficial	
Beavers and farming can easily co-exist	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Beavers cause irreconcilable problems with farming.
Beavers could reduce flooding problems	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Beavers will make flooding worse
I would like to see beavers back in England after 2020.	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	I would not like to see beavers back in England after 2020.
Do you have any specific questions or concerns about beavers, or anything that you hope will be answered during this presentation? 		
Event details :		

River Otter Beaver Trial (ROBT) Fourth Annual Report – April 2019



River Otter Beaver Trial... Update 2018 - 19



Riverfly monitoring

Volunteers being trained to riverfly survey on the River Otter in 2018

The Riverfly Partnership is a dynamic network of organisations, representing anglers, conservationists, entomologists, scientists, watercourse managers and relevant authorities, working together.

The Riverfly Partnership is hosted by the Freshwater Biological Association. The River Otter Fisheries Association has begun training a team of volunteers to river fly to monitor the health of watercourses within the catchment. It is a very simple method which uses a few indicator species to assess how healthy the stretch of river is, and how it is impacted by pollution. After a one-day training course volunteers are able to identify the larvae of mayflies, caddisflies (sedgell) and a few other common insects. Lots of advice and support is given to volunteers to ensure they are confident and familiar with the process.

To get involved in this project on the River Otter, contact Oily Forster on 01749 646666 or oily@riverpark.co.uk

Even if you don't live in the River Otter, you can get involved in Riverfly wherever you live.

If you are interested in helping on any other Devon rivers, you can contact richard.hopkins@riverpark.co.uk who will put you in touch with your local team. You can also find the local contact and much more information by visiting the national website www.riverflies.org

Importance of buffer strips to healthy rivers and beavers

Diffuse pollution (the run-off of top soil and animal waste from surrounding land) is one of the most pressing challenges affecting the quality of our rivers and streams and their ability to support wildlife. Many wildlife watchers and anglers are concerned about the troubling declines in river insects such as mayflies that result from these water quality problems.

One of the best ways to combat diffuse pollution is to leave a buffer strip of natural vegetation alongside each watercourse. The strips only need to be a few metres wide but they can be highly effective in reducing run-off, while they also provide vital corridors of habitat for beavers, and a whole host of other wildlife.

The River Otter Beaver Trial is stimulating a lot of conversation about how much space should be given to watercourses and nature, as well as the payments that society could provide to farmers for doing work to create them. If society provides payments to farmers for ecosystem services, such as the provision of clean water and biodiversity, we could all be better off. The benefits that beavers may bring for water storage would also be maximised, and conflicts reduced.

The River Otter has a healthy population of trout, which are found throughout the catchment

www.devonwildlifetrust.org

Protecting Wildlife for the Future

River Otter Beaver Trial: 2018-19 update



River Otter Beavers grow to eight family groups

We are now approaching the end of the fourth year of the River Otter Beaver Trial, and the beavers are thriving. Numbers have grown from two family groups at the start of the trial in 2015 to around eight families by the summer of 2018. This growth is similar to the projection we made at the start of the trial, and fits in with how we might expect a native resident species to re-occupy its former range.

To find out more about the background to this pioneering project and to see how you can become part of it, please visit

www.devonwildlifetrust.org/what-we-do/our-projects



This stunning picture of a River Otter beaver was taken near Otterton by local wildlife photographer, David White

Mobile beavers

At present, the beaver population remains relatively small in relation to the size of the River Otter and its tributaries. It's also a mobile population, and we continue to observe significant movements of family groups and individuals throughout the river catchment.

This mobility was particularly apparent in the case of two high profile beaver families on sections of the River Otter with good public access. During the summers of 2014 and 2015, a yellow tagged female beaver (and her family) were frequently spotted near Otter St Mary, and then in summers of 2016 and 2017, a pink tagged female provided consistently excellent views north of Otterton. In both cases, these families subsequently moved off into other stretches of the river with no public access. This made watching beavers a much less predictable activity with far fewer sightings during the summer of 2018.

As beaver numbers continue to increase, the animals will push into other parts of the river catchment. Their territories are also likely to become more stable. This may result in more chances for beaver watching and perhaps allow local businesses to develop opportunities around this activity.

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Beaver dams



Large dams can appear much more permanent but can still be temporary structures, especially in bigger streams. This photograph was taken in October 2018, and depending on the conditions, it may not have survived the winter.

Beaver dams vary enormously. In many cases they are small temporary structures which gradually break down as water levels rise. In others, they are large stable structures that create big ponds, and can even cause streams to change course or divide.

Our monitoring shows that there were around 26 dams in place in the River Otter catchment in December 2018. Since 2015 we have recorded 81 dams, many of which have since been washed away. Some of those dams have been rebuilt by the beavers. In a few places dams have been removed by landowners and/or River Otter Beaver Trial team. We believe that this active and pragmatic intervention is the best way to help local communities and beavers co-exist in the long term.

Small dams can form quickly, and then wash away as soon as river levels rise.



Even temporary beaver dams can significantly alter watercourses. These two pictures, taken at the same location, show how a deeper silty stretch of river was restored by the building and washing out of a beaver dam.

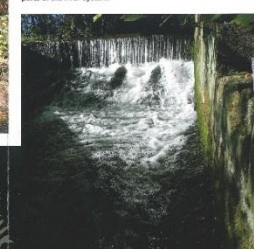


Do beaver dams prevent fish migrating?

One of the concerns expressed about beavers is that their dams might prevent the movement of migrating fish, in particular trout and salmon that move upstream to spawn in gravel beds.

Using the expertise from the Westcountry Rivers Trust, the River Otter Beaver Trial is developing a method for assessing the passability of beaver dams for trout and salmon. By measuring key dimensions and adapting techniques that are used on man-made dams a model is being developed which will allow us to assess the fish passability of individual beaver dams. With this tool it would then be possible to make quick and accurate decisions about when intervention could most help the movement of fish.

Artificial structures like this concrete weir act as formidable barriers for migrating trout and salmon, preventing access to large parts of the river system.



Small trees next to watercourses can easily be felled by beavers. This apple tree has been protected from the attentions of local beavers using galvanised wood mesh (shown right).

Interactions with beavers

If you are close to an adult beaver when it displays its 'tail slap' warning, it can be intimidating. However, once you realise the addition of spray and noise that results from this behaviour is designed to scare a predator, which also serves to warn other fish of a possible threat, it you happen to be in the water when this occurs, it can be disconcerting, particularly if accompanied by a 'rock chop' which adds weight to these postures. However, in 2018 we had one case reported of a night-time angler encountering this territorial behaviour on the River Otter.

This behaviour may be more common during the season when beaver kits are in and around the burrow (May - June). They do also appear to be more defensive towards cattle and dogs during this period. If you do find yourself in the water with a beaver at this time of year, it is probably best to simply move away slowly with your arms out from your chest to indicate you wish to retreat.

News of encounters with and sightings of beavers remain very important to the Trust, especially if you wish to spot a beaver with a coloured ear tag. Many of the River Otter beavers have been fitted with these in accordance with the licence conditions, and your sightings will be a key part of the research programmes we run on these fascinating animals.

To report sightings email beavers@devonwildlifetrust.org

Beavers live here

Signs like this one have been erected in places along the River Otter in order to reduce the risk of disturbance to beavers and their potential conflict with people. In June 2017 a local dog owner called daily by a beaver. We feel it is important that dog owners and other users are aware of beaver locations to help prevent these types of incident re-occurring.



Devon Wildlife Trust logo and address: 21/2021

Support DWT at www.devonwildlifetrust.org

River Otter Beaver Trial (ROBT) Fourth Annual Report – April 2019

ROBT Media coverage April 2018 – March 2019

05/04/2018	The Sun newspaper	Dam Shame as car kills beaver
05/04/2018	Daily Telegraph	Wild beaver is first to be killed by car in Britain
05/04/2018	Daily Mail	Devon Beaver is run over by a car
05/04/2018	Sun online	A Dam Shame - Wild beaver killed by car in Devon thought to be first...
05/04/2018	Mail online	Wild beaver becomes the first ever to be killed by a car in Britain
01/05/2018	CBO News	Otterhead Lakes news
08/05/2018	BBC R4 - PM	Piece about the impacts of the DWT Enclosed beavers on flooding
10/05/2018	Daily Telegraph	Beaver family cleans up polluted river...
01/07/2018	Country Living Magazine	All creatures great and small
01/07/2018	Countryfile Magazine	Beaver Revolution
24/07/2018	BBC Radio Gloucestershire	Morning news - interview with Richard Brazier
24/07/2018	BBC Radio Gloucestershire	Drive time - interview with Mark Elliott
01/08/2018	Tale Valley Trust newsletter	ROBT - River Tale update Aug 2018
01/09/2018	Countryside Land Management	The Return of nature's water engineer; the beaver
01/10/2018	Countrystore Magazine	A dam fine solution
16/10/2018	BusinessGreen.com	Green Britain week - Future jobs: from beavers to Brexit
13/10/2018	BBC1	Escape to the Country
23/10/2018	BBC Radio 2	Breakfast Show with Sara Cox
26/10/2018	BBC Radio Devon	Interview with David Fitzgerald
05/11/2018	The Wildlife Trusts publication	The Wildlife Trusts' Beaver Reintroductions
01/11/2018	7Two TV, Australia	News of the wild
05/12/2018	Fingle Woods blog	Eager beavers at Fingle woods
22/12/2018	New Scientist magazine	Walking in a beaver wonderland
22/12/2018	New Scientist online	The secret site in England where beavers control the landscape
20/12/2018	Metro Newspaper	We should build a place for beavers in our flood defences
20/12/2018	Devon Mammal Group newsletter	ROBT Update
14/02/2019	Lush website - BLOG	Put a beaver in your river
11/02/2019	Alamy Blog	The reintroduction of beavers into the UK
05/03/2019	Fingle Woods blog	Eager beavers part 2

River Otter Beaver Trial (ROBT) Fourth Annual Report – April 2019

The coverage of the ROBT and beavers in England more widely, continues to be very positive. Pulses of coverage have come from the discovery of the dead beaver on the road in April 2018, and from the release of beavers into the Forest of Dean in July.

As well as a number of pieces on BBC Radio Gloucestershire, the Forest of Dean release also provided opportunities for the ROBT to highlight the role of beavers in reducing flood risk on the BBC Radio 4 PM programme. A series of three features were broadcast over a few months in the lead up to the release date, with the middle piece about the hydrology research in the Enclosed Beaver Project being broadcast on 8th May 2018.

A visit from Graham Lawton from the New Scientist magazine in the autumn also saw the publication of a news feature in December 2018 (right), and also a piece in the Metro newspaper which is widely distributed to commuters on the railway network (below).





ALL CREATURES great & small

Patrick Barkham celebrates the long-standing residents that make up Britain's rich fauna



TAKE A STROLL ALONG THE RIVERBANK BEYOND THE Devon village of Otterton on a fine evening this summer and you'll encounter an unusual number of people. 'Beaver' blankets are placed beside the River Otter, small children sit on parents' shoulders and all eyes are fixed on the largest midsummer flow. A bubble of water and suddenly there's a tail the colour of mud slips against the water. A blunt nose, big black nostrils and a sizeable, flat topped head rise above the surface. Watching an otter in the wild is still a thrill, but this is something much, much rarer – a beaver.

The beaver was hunted to extinction in Britain nearly five hundred years ago but is now swimming along a select number of rivers in Scotland and England. Its return is captivating, curious and controversial, for not everyone is keen to have these great engineers reshaping our waterways. It is easy to mistake a beaver for an otter simply because that the only large mammal we've used to glimpsing on a river, but the two animals are completely different. The otter is a voracious predator, a misanthropic member of the weasel family. Its life is a ceaseless patrol in search of fish. Many people assume the beaver also eats fish – blame CS Lewis, who put fish-eating beavers in *Narnia* – but the otter-eater beaver is a herbivorous rodent. As soon as you see

one on the water, the difference is obvious: while beavers are famed for their busyness, they are much slower, calmer and more relaxed than the otter, pottering about, gnawing their rather dishevelled-looking yet far, in late summer, the beaver's kits appear, which are a big draw for the crowds in Devon: these adorable baby animals paddle through the water like aquatic guinea pigs. But such idyllic scenes do not reflect the beaver's history in our country. It was already rare by medieval times, when illustrated compositions of beavers (known as 'bestiaries') depicted the hapless creatures on the run, pursued by a horn-blowing hunter and his dogs. The beaver's blood, for was very desirable – it was also quite meaty, but most of all it was sought out for its mark, a pleasant-smelling substance that it secretes to mark its territory. This is still used today in some perfume and flavourings in earlier times, it was considered to have medicinal value, and treated everything from headaches to hysteria. After being wiped out in Britain, the Eurasian beaver was hunted almost to extinction – just 1200 remained by the beginning of the 20th century.

Today, however, the beaver is being welcomed back for a different purpose: as a boon for biodiversity and as a floodwater engineer. In Europe, reintroductions and legal protection have seen populations increase by more than 14,000 per cent since the 1960s, with the beaver thriving everywhere from Norway to Germany to Romania. In Scotland, an official trial reintroduction of the beaver into Knapdale, Argyll, in 2009 has been followed by several more successful reintroductions on farmland river systems, including the Tay and the Forth. Somewhere, somewhere, is determined to see wild beavers swimming free again, for beavers have also suddenly appeared on the River Otter in Devon.

ENVIRONMENTAL BENEFITS

Beavers may look like placid animals but they work profound change on their environment. The phrase 'they are a beaver' reflects their industry: they fell riverside saplings and trees with their high orange teeth to dam rivers, creating deeper water in which they feel secure. In doing so, beavers build a wildlife



Ever-enduring, the beaver is a resilient species. Adults care for their kits on the River Otter in Devon (top)

68 AUGUST 2018

Article in Country Living magazine – July 2018



Introductions of beavers have been carried out with a woodland enclosure in Devon (above) and Gloucestershire (below right)



paradise of amphibian and insect-friendly ponds. Scientists counted ten clumps of frogspawn in a small valley in West Devon in 2016; after the site was securely fenced, a pair of beavers were introduced and built their dams and pools. Last year, there were 681 clumps of frogspawn. Water beetle species were raised from eight to 26, and water-loving creatures, from kingfishers to willow tits and rare barnswallow buzzards, all returned. In Scotland, ecologists found that beavers increased the number of plant species by nearly 50 per cent because these industrious animals create boggy meadows and sunny glades, where many more plants, as well as dragonflies and butterflies, thrive. The West Devon experiment also demonstrates how beaver dams filter out pollutants such as phosphates from the stream.

The Scottish authorities have recognised the beaver again as a native animal, ensuring it has protected status. In England, they now number 27, while across eight territories along the River Otter, and are still 'on trial', with the Government due to conclude in 2020 whether they can stay. The reason for this tentative status is that farmers in Scotland have objected to the animal's return. Beavers have been shot because their dams can, potentially, cause water to flood onto valuable farmland in lowland areas. In the right places, however, beavers provide a useful form of natural flood defence. Because they create so many extra ponds along rivers, they slow the flow of water downstream. They turn a river into a giant sponge, holding back water and dramatically reducing peak flows after heavy rain. This can reduce the risk of flooding fields and towns further downstream.

A PROMISING FUTURE

In the past year, beavers have been released into fenced areas of the Forest of Dean and Cornwall to help prevent rivers flooding. Other conservationists and landowners – including at Knap, a rewilded farm in West Sussex – are set to apply to the Government for permission to release beavers on their land. 'It's really encouraging,' says Mark Elliott of Devon Wildlife Trust, which is managing the beaver trial in the county. 'They are such impressive engineers of water – that's what we're excited about them.' According to Mark, local landowners, farmers and anglers on the River Otter are positive about the reintroduction. 'It shows that people and beavers can be alongside each other.'

Beaver dams will collapse in extreme floods but, as one pro-beaver farmer says, they quickly build another. Better still, they work for free and don't take help for the rest of us, without becoming a meaty go-beaver waiving. Over the coming decades, this peaceable, hard-working animal is likely to become a more widespread riverine attraction.

HOW TO SPOT THEM

- The Devon Trust in south-west Wales offers wild beaver spotting from a hide overlooking a fenced pool from 1pm for £20 per visitor. Book online (beavertrust.com/)
- Beaverwatching.html
- Alga Vale Centre on the River Beaulieu in Scotland offers beaver spotting from a hide overlooking

- To fence pools (big.co.uk)
- There are also wild beaver flood defence projects in Lydbrook, Forest of Dean, and in Ludlow, Cornwall, where Cornwall Wildlife Trust runs bookable weekly brown watches throughout the autumn (cornwallwildlife.org.uk/beaverproject/)
- You can always organise

- your own beaver spotting expedition in the wild, with populations in Knapdale and along the Tay in Scotland, and the River Otter in Devon. Follow the riverside footpaths north on the western bank of the Otter from Otterton Mill.
- The best time to go beaver spotting is an hour before

- sunset in summertime; you'll need to keep quiet and find a stretch of river to look over. Ask locals or fellow visitors for tips about where the beavers have been seen. Keep an eye out for unusually clumped sticks and felled tree branches. Please stay on public footpaths and leave your dog at home.

countryliving.com

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Mark Elliott

help provide the evidence that will enable the government to make a decision in 2020 about the future of the beaver in England. The Scottish

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licensees, these bearers are permitted to travel anywhere within the River Otter catchment, but in the event that they are shown to have dispersed into an adjacent river, the license holders may be required to retrieve them.

Although beavers are agents of ecological restoration, their engineering activities bring them into conflict with many human activities. If they are to be accepted back into the British landscape, a clear management framework will need to be in place to assist those attempting to farm and manage land in conventional ways.

As well as a clear financial incentive package for landowners to allow beavers to create valuable wetlands on their land and give them

Annual systematic surveys of beaver (fish weas) in trout conditions between January and March, while swimming on a rocky riverbank at its peak and at the low water level are common, allowing further use of the data to estimate directly into GIS software using a Trilite GIS device fitted with a slider to accurately measure features on the opposite bank or in the river itself. (Source: www.bepi.be)

- They also make water levels, breaking ponds and

- Buttle and dams in steepen rivers and increase overtopping and erosion, creating a range of habitats for fish spawning and feeding (mainly in rivers and streams)
- Through hydraulic friction, dams and trees affect a river's flow (mainly in rivers and streams) either on the speed of floodwater moving through, or on the flow of water back and producing areas from flooding.
- Water quality is affected by dams because they alter the natural flow of water in rivers and streams, which is important for fish and other aquatic life.
- Coping with water and other environmental issues is a challenge for the world's cities and towns, which is why it is important to have a good understanding of the issues and the solutions.



5. *Construction Management*, Autumn 2008 Vol. 36, No. 1

OWEN's Unleashed Future Project also has a database of 75 ponds that have been constructed by homeowners in the last 10 years and are for nothing but to provide green space in local neighborhoods. Jason Welford, Executive Director of the project, says that the ponds are a great way to improve the environment and provide a place for children to play.

most of a butcher against borrowing there needs to be a strong support available to help people live through the process and realize some of the credit is for just that. For instance, certain *ricicleros* try to live on credit, and no economic information will need to be provided to enable equipment, roads and so forth. Borrowing into cash banks, does or food and shelter is also unacceptable in most cases. Therefore, a management framework would need to include a mechanism for removing borrowers from areas where they are causing problems.

There have been data about tarsal and hindlimb length in our study. However, these data also showed that tarsal and hindlimb length were not linearly related to the length of the beak. In fact, a *hypo* group with a short beak had almost a huge gap in tarsal length compared to the *hyper* group. This was clearly an outlier, the data without the beaver being able to do their data repeat to be looking.

There are some things to be interested. There will be some locations where the pressure might cause a beaver to compress or advertise other critical information. The beaver will be able to tell the difference between the two groups. The beaver will be able to tell the difference between the two groups.

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The beaver fence in the Tamar catchment surrounds a remnant area of Gully grassland habitat into which

willow, birch and gorse scrub is rapidly encroaching. Devon Wildlife Inst

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The return of nature's water engineer: the beaver



The posts of the enclosure are on the outside of the fence, and an apron prevents the beavers burrowing underneath (left). Reachers are more likely to escape where watercourses pass under the fence. A purpose-built metal grid is attached to the face of the culvert – ideally at the upstream end to prevent blockages by debris. Buried wire mesh prevents burrowing under the pipe (middle). The complicated fences also have two strands of electrified wire on the inside to prevent beavers climbing it. Trevor Willford, Trust

using conventional techniques. For example, a separate part of this County Wildlife Site had already welcomed contractors, clearing scrub with chainsaws and brush-cutters, and treating stumps with herbicides, with funding through Higher Level Stewardship. The objective with the heathers, however, was to understand whether they could coppice some of these trees and help tip the balance back in favour of more open habitats.

The main cost of holding beavers in an enclosure is the fence itself. Generally speaking, when beavers are established within a large fenced enclosure and have adequate food resources throughout the year, there is little reason for them to escape. They are, however, fiercely territorial and at around two years old the kits may disperse (run or be pushed out of) the territory. A territorial conflict between individuals is the type of situation that makes an escape attempt more likely, and so removing juvenile beavers before they reach two years is a way of reducing the risk of escape and aggression.

A heaver fence is a significant piece of infrastructure. The initial cost of the fence in this case was in excess of £30,000. In the heavy clay soil of the Culm grasslands, and with the high rainfall in this part of Devon, fence posts can rot

quickly at ground level, and so redwood posts with a 15-year guarantee were used. After clearing a 5-m corridor of trees and scrub for the fence-line, the posts were placed at 4-m intervals. Rolls of 1-m wide weldmesh were then laid out and attached to the inside of the posts – ensuring that the beavers did not have access to the wooden posts themselves. A separate sheet of weldmesh was then laid flat on the ground around the inside of the fence, providing a significant 'apron' to prevent beavers digging underneath.

Beavers are exceptionally good diggers but they do not travel far from the safety of water, and so it is relatively easy to predict where fence lines are most vulnerable to escape attempts – around culverts that carry watercourses under the fence, or near deep water that may conceal burrow entrances.

Beavers are semi aquatic and so live in and around water. They construct burrows and lodges with submerged entrances and like to have stable water of roughly 70cm depth. If they do not have access to these conditions, their first instinct is usually to migrate to a more suitable area.

If, however, they find themselves unable to move for any reason, be it a beaver fence or the presence of adjacent beaver territories, they will engineer

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 University of Exeter have been busy writing and submitting papers for a number of journals. The focus in the last 12 months has been on the Beaver Dam Capacity (BDC) modelling work and on the results of the public perception survey. At the current time, these papers haven't been published, but this is anticipated in 2019-20. However, the UoE team presented a paper on the BDC modelling work at the European Geophysical Union (EGU) in April 2018

8th International Beaver Symposium, Denmark

In September 2018, the 8th International Beaver Symposium (8IBS) was held in Denmark, and the ROBT project team attended and gave two presentations on the work in Devon. One was focused on the Beaver Dam Capacity (BDC) modelling work being undertaken by PhD research Hugh Graham, and its potential application in targeting resources in likely conflict areas. The other was around the Enclosed Beaver Project and the mapping of the changes that have occurred since the beavers were introduced in 2011, and the impacts on hydrology and water quality.

Support for other beaver projects

The ROBT team have also been providing advice and support for other beaver projects in England. These include a proposal by Plymouth City Council to introduce beavers into an enclosure at Poole Farm, and numerous other sites including the Forest of Dean project and elsewhere.

River Otter Beaver Trial (ROBT) Fourth Annual Report – April 2019

Visits to Enclosed Beaver Project

An important role that ROBT is able to play in the development of other projects is the hosting of visits by stakeholders and partner organisations. As well as the many visits to the River Otter as outlined above, DWT is also able to show people around the Enclosed Beaver Project site where the impacts of beavers are most dramatic. In the last year, 19 different visits have been held at this site, with around 200 people attending. These groups have varied enormously in size and their interests as this table below highlights.

Enclosed Beaver Project		attendees
12/04/2018	Guided walk for FC conference	30
20/04/2018	Deborah Brady, Cumbria University	1
26/04/2018	Plymouth City Council volunteers	15
08/06/2018	National Trust - south downs visit	4
14/06/2018	Gareth Willaims from Sussex EA	1
21/06/2018	EA National Stakeholders team visit to Boldventure	15
21/06/2018	DWT Trustees evening visit	12
22/06/2018	The Flow Partnership visit to Boldventure	30
12/07/2018	Adrian Colston visited with Pete	1
13/07/2018	Dominick Tyler visited with Mark	1
18/07/2018	Dorset WT visit	12
24/10/2018	Sir Prof. John Lawton	4
13/11/2018	DWT Conservation Advocacy Directorate + NIA visit	25
12/12/2018	Visit with Graham Lawton (New Scientist)	2
13/12/2018	Visit with Tom Shelley and Chris Jones	2
23/01/2019	NE Trainees and Escot Education team and NIA staff	13
12/02/2019	Visit with Katalina Caliendo (artist)	1
01/03/2019	Woodland Trust visit	12
06/03/2019	Purbeck National Trust and stakeholder Group	16
TOTAL		197



The Enclosed Beaver Site in West Devon continues to be an important demonstration site to show interested stakeholders what beaver activity can look like in a small headwater stream, and how this can have a profound impact on the hydrology and ecology of a stream.

Beaver Advisory Committee for England (BACE)

The Beaver Advisory Committee for England held another meeting in November 2018; its first for several years. This committee includes a wide range of organisations with an interest in beaver reintroduction. The ROBT provided an overview of the work of the Trial, and introduced some of the principles developed by the Beaver Management Working Group. In preparation for this meeting, the Wildlife Trusts nationally produced a publication 'The Wildlife Trusts' Beaver Reintroductions.'



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 19th April and 11th October 2018, and the future of Beaver Management after the Trial has been a significant ongoing item on the agenda.

A new **Beaver Management Working Group (BMWG)** was also established by the Steering Group in October 2017 and the Working Group have held meetings on the following dates:

- 17th October 2017
- 24th November 2017
- 11th January 2018
- 23rd March 2018

- 28th June 2018
- 12th September 2018
- 21st March 2019 (short meeting)

The **Natural England Licence group** has met less frequently in the past year. Natural England convene this group and meetings were held on 16th May 2018, 27th September 2018, 10th January 2019.

The **Science and Evidence Forum** met on 4th June 2018, 10th September 2018, 10th December 2018. The SEF also began preparations for the production of final reports and writing workshops were held on 11th January 2019, 28th February 2019 and 28th March 2019.

The **Fisheries Forum** met on 31st October 2018 and included a field visit to see the Bicton Brook around Otterton, and the Budleigh Brook.

The **Community and Education Forum** has not met this year.

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 2019

1. **The beavers are continuing to have many effects in the River Otter valley, but these are judged to be largely positive. There have been a small number of cases where tree felling has been raised as a concern but these have been dealt with swiftly. In one case the visual appearance of the tree protection is still of concern, and work is ongoing to resolve it.**
2. **For the final year of the Trial, funding has been secured from external funders and from DWT core funds.**
3. **There have not been any cases in 2018/19 that suggest any risks to human health, livestock or other wildlife.**
4. **The beaver population continues to grow and colonise the catchment. Only one case of mortality has been detected in in this year of the Trial. There is no evidence of persecution.**
5. **A small group of landowners on the River Tale have expressed their opinion that the beavers should not be permitted to remain on the River Otter. Otherwise stakeholders seem to be accepting that beavers might remain after 2020.**

At the ROBT Steering Group meeting on 25th April 2019 it was confirmed that, based on this assessment against these triggers, it was not necessary to implement the exit strategy.