

# North York Moors National Park Authority

1 October 2018

## Yorkshire Beaver Enclosed Release Trial

### 1. Purpose of the Report

- 1.1 To present information about a proposed Beaver enclosed release trial in the North York Moors National Park and agree the Authority's response.

### 2. Background

- 2.1 The 25 year Environment Plan advocates greater use of natural flood management techniques to reduce the risk of harm from flooding.
- 2.2 In the Derwent catchment, a pioneering 'Slowing the Flow' project has been implemented to reduce the risk of flooding in the lower catchment by using natural flood management techniques in the upper catchment. It uses a wide range of measures which work together at the catchment level to mitigate flooding downstream such as blocking moorland grips, tree planting, introducing woody dams and the construction of a substantial earth bund to hold back large volumes of water during flood events. The Authority was closely involved with this work through its ownership of the Levisham Estate, as planning authority for much of the area and as an active member of the project partnership.
- 2.3 To complement this work, the Forestry Commission (FC) has proposed a project to create a 16ha enclosed trial beaver release site on their own land in Cropton Forest to investigate the efficacy of the use of beavers as a technique in natural flood management.
- 2.4 The objectives of the trial are to:
- Assess the beavers' impact on the long term sustainability and maintenance of existing 'slowing the flow' wooden dam structures
  - Study the water attenuation of any additional structures created by the beavers
  - Encourage the restoration of riparian and open water habitats and increase biodiversity along the river corridor
  - Explore opportunities for ecotourism and to engage and educate people
  - Investigate the impact of beaver on the control of rhododendron in a riparian habitat

### 3. The Trial

- 3.1 A project method statement for the licence application made to Natural England (NE) is in **Appendix 1**. This document explains the trial in detail.
- 3.2 The trial is proposed in the Sutherland Beck Valley in Cropton Forest. The release site is a 16ha enclosure with a mixture of beech and pine with a rhododendron understory. There are also plantations of Norway spruce, Scots pine and Douglas fir with minimal understorey and ground flora and stands of mixed age silver birch. The site also contains two existing ponds and a number of manmade wooden dams of various sizes constructed as part of the Slowing the Flow project.

- 3.3 The site has been assessed by Derek Gow (Derek Gow Consultancy Ltd) and is considered as highly suitable for Eurasian beaver (*Castor fiber*) release due to the combination of habitat, topography, presence of manmade flood mitigation, a good baseline of water flow data and access.
- 3.4 The site would be enclosed with a 1.2m high post and tensile wire fence which would adhere to the minimum standards required to contain beaver as set by species specialists and NE. Potential escape routes upstream and downstream such as ditches, culverts and drains will be blocked using in-water engineered solutions. All of these structures, apart from the fence (as it is less than two metres high), require planning permission which will be sought shortly.
- 3.5 The beavers will be released in a small family group which could be up to 8 in number (adult breeding pair, their yearling offspring and young). The carrying capacity for the site has been estimated to be a maximum of 15 individuals.
- 3.6 Beavers will be translocated using specialist beaver husbandry and transporting methods and could come from captivity in Europe or the UK, the wild in Scotland under licence or the wild from continental Europe.
- 3.7 As is best practice, the beavers will be microchipped to assist with identification. Their health will be monitored with trail cameras and through annual trapping for health checks and tagging of new offspring.
- 3.8 The site will be fenced using a tried and tested design to minimise the risk of escape from the enclosure. The site will be inspected weekly by FC staff and volunteers to ensure the integrity of the fence line with additional checks following significant weather events. The site itself minimises the risk of escape in that the enclosure provides suitable and abundant habitat so the temptation to try and escape is reduced. A strategy for dealing with escapees has been devised in consultation with species experts and is included in **Appendix 1** (page 18).
- 3.9 Baseline surveys of the terrestrial and aquatic habitats and species will be undertaken prior to the beavers' release and followed up annually to monitor change. Fixed point photography, water level monitors and rhododendron mapping will also take place as part of the baseline data collection.
- 3.10 The activity of the beavers and the impact on habitat would be monitored using drones which will in record the topographical and vegetation changes on an annual basis. Water quality monitoring will also take place upstream and downstream prior to the beavers release and annually thereafter.
- 3.11 The trial would last for a period of five years, after which an assessment would be made as to whether the beavers would stay within the enclosure or be returned to a holding facility in Devon.

#### 4. **Consultation**

- 4.1 NE is the decision making body for the grant of the licence (under Schedule 9 of the Wildlife and Countryside Act 1981). NE are set to approve this licence. They have asked for a letter of support from the Authority before they do this, however, as we are not a statutory consultee they would be able to give their approval without this.
- 4.2 FC are currently undertaking a local consultation with a wide range of stakeholders and will be holding a public meeting in October to give people chance to discuss the proposals and raise any concerns.

4.3 Policies in the Management Plan are generally supportive of the idea and officers believe it has considerable merit for the reasons given in the proposal. The NPA has however not got any specific policy in this area and consulting people is its preferred method of operation. Therefore officers recommend that the NPA wait until the results of the local consultation prior to giving its official response on the project.

**5. Financial and Staffing Implications**

5.1 The proposal would inevitably involve officer time but this is not expected to be significant. The Authority expects to be asked for a modest financial contribution but this issue would be best dealt with after a formal view is taken on whether to support the licence application.

**6. Contribution to National Park Management Plan**

6.1 Although there are no specific Management Plan objectives to reintroduce species into the Park, if approved, this project would contribute to the achievement of Management Plan objectives E1, E11, E13, E42, E43 and E44.

**7. Legal Implications**

7.1 There are no legal implications arising from this report. The NPA is not a designated advisory body but an informal consultee.

**8. Recommendation**

8.1 That Members delegate the decision to support the application to officers, unless local consultation reveals strong objections, in which case the decision will be referred to full Authority.

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**Background papers to this Report**

**File ref**

None

# **Yorkshire Beaver Enclosed Release Trial Project**

## **Objectives, method statement and monitoring.**



Adult Beaver at Knapdale – Steve Gardner

**Site location – Sutherland Beck, Cropton  
Forest**

**Project Lead partner – Forestry Commission**

## **1. Introduction**

The new Defra 25 Year Plan for the Environment proposes that natural flood management (NFM) measures should be more widely used as an integral part of the country's approach to reducing flood risk.

The Slowing the Flow Partnership (STF) is in the process of quantifying the longer-term contribution of NFM measures and mitigating future costs associated with maintaining structures or channel interventions. Costs associated with installing and the subsequent maintenance of woody debris dams and associated structures are a key issue hindering the adoption of STF projects here and elsewhere in areas subject to spates of flood water threatening downstream infrastructure.

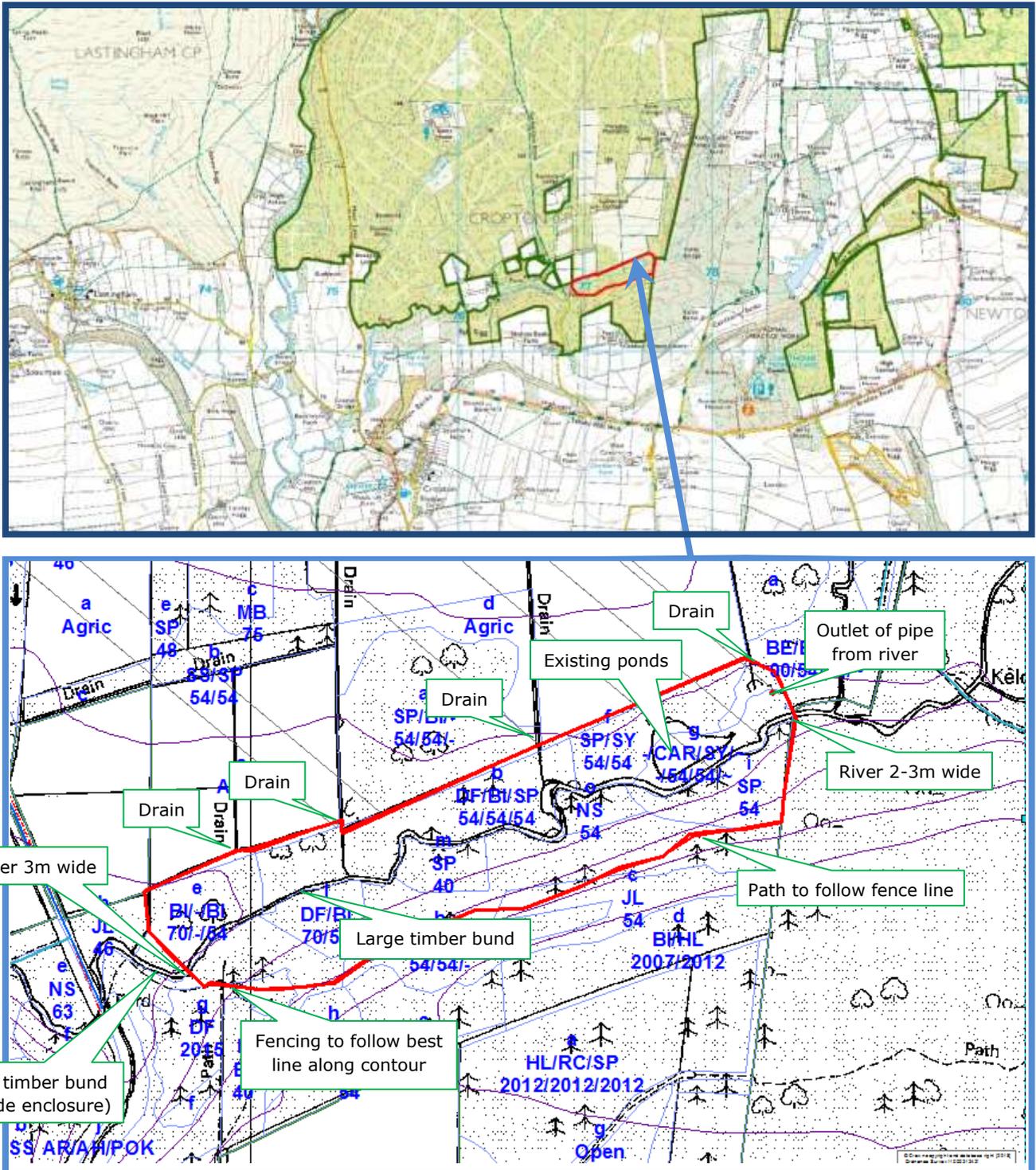
The proposal is to create a 16ha enclosed trial beaver release site in the Sutherland Beck Valley, Cropton Forest. (Fig.1) Sutherland Beck flows into Cropton Beck which feeds into the River Seven and is part of the River Derwent Catchment. Nearly a kilometre (824m) of the beck will be within the enclosure.

The surrounding habitat within the proposed enclosure is a mixture of widely spaced beech and pine with a rhododendron understorey, plantations of 1954's Norway Spruce, 1940's Scots Pine and 1970's Douglas fir with minimal understorey and ground flora and stands of mixed age Silver Birch.

There are 2 existing ponds in the proposed enclosure. These ponds were created in the late 19<sup>th</sup> century as fish ponds for the Keldy Castle estate; they first feature on the 1891 OS maps. They are a historical feature in the landscape with a high conservation value.

This stretch of the Sutherland Beck was part of the original 'Slowing the Flow' research project focusing on natural measures to alleviate flooding downstream and there are 2 semi-engineered man-made timber bunds in place across the beck.

**Fig. 1**



## 2. The Outcomes

### a) Assess the beavers impact on the long term sustainability and maintenance of the 'Slowing the flow' structures

Sutherland Beck rapidly responds to periods of high rainfall with evidence of scoured banks along its length. Because of this and issues with flooding in the villages downstream it was identified as a key site for implementing in stream measures for the 'Slowing the Flow' project.

The stretch of the Sutherland Beck within the beaver enclosure has a large semi-engineered timber bund which was installed in 2011. **(Fig.2)** There is a 2<sup>nd</sup> timber bund just downstream of the proposed enclosure. 2 more typical smaller wood dams to the specification in the Countryside Stewardship Scheme will be installed in the channel in consultation with Tom Nisbet of Forest Research to further investigate the impact of beavers on these structures. **(Fig.3)**

Evidence from the Bridge Creek Restoration Project, Oregon (The Eurasian Beaver Handbook – Roisin Campbell-Palmer) has shown that beavers will adopt, maintain and reinforce man-made structures. One of the main reasons for this trial would be to investigate the impact that beaver have upon the structures in the Sutherland Beck. Monitoring whether the beavers adopt and reinforce the man-made features could offer a natural long-term sustainable solution for 'natural' flood control structures going forward. If these can be strategically placed by humans where they are essentially desired and then maintained, extended and developed further by beavers their utility could be greatly extended.

#### Monitoring

- Pre-mapping of the landscapes prior to beaver introduction. The two timber bunds have already been mapped by Tom Nisbet of Forest Research, which includes a detailed survey of the cross sections of the channel and floodplain along the whole reach between both bunds, and modelled resulting flood flows and interactions with the bunds. Further mapping of the area will be done as necessary to get a clear picture of the whole area within the enclosure before beaver release.
- Fixed point photography of the existing structures and installation of trail cameras to capture live footage. These will complement the camera on the lower bund which takes fixed images every 15 mins and the ones in place by Durham University.
- The flow rate of the river has been measured along the watercourse since the installation of the man-made dams as part of the 'Slowing the flow' project giving us a long history of hydrological data for the beck. This monitoring will be continued after the beaver release to determine any differences. 2 of the existing water level monitors will be outside of the proposed beaver enclosure. Additional level monitors will be placed upstream of the enclosure and also upstream and downstream of any new wood dams if budget allows.
- Changes to the ponded depths of water behind and the porosity of the timber bund and other structures will be monitored, along with changes to

the strength of the of the logs in the timber wall if these were holding back a significant depth of water on a semi-continuous basis



**Fig 2.** Large timber bund within the enclosure



**Fig. 3** Smaller woody dam downstream  
(2 of these structures to be built within the enclosure)

## **b) Study of the water attenuation of the additional structures created by the beaver**

There is substantial evidence throughout the range of both beaver species – the Eurasian (*Castor fiber*) and the North American (*Castor canadensis*) - of their ability to significantly alter the hydrology of watercourses through a broad range of natural behaviours. These variously extend to the creation of multiple impoundments, the placement of large volumes of woody debris in-channel and the excavation of burrow systems. All of the forgoing in combination can result in the reformation of wetland mosaics, pools, meanders, extensive surface water flows and rapidly rising levels of groundwater. Beaver dams also act as highly effective natural filters which assist in the purification of water by trapping silts, phosphates and dissipating nitrates. In a UK setting detailed studies are being conducted by the Devon Beaver Project and although some of this will be comparable, this project will build on that research in an upland woodland landscape where human generated flow devices already exist. .

The project will allow us to evaluate the landscapes water storage capacity before and after the beaver release, quantifying the volume and rate of water entering, leaving and being stored within the site.

### **Monitoring**

- Visual monitoring will be done by drone flyover taking high resolution photographs. This will be done before and annually after release at the same time of year.
- Detailed topographical maps will be drawn up from these photographs to allow any new water features and topographical changes to be accurately mapped and pond volumes calculated to assess additional and potential water retention.
- From the images changes in the woodland canopy within the enclosure will be measured and considerations made as to how this affects site water usage.
- In addition to the flow monitoring already mentioned, water quality will be monitored by kick-sampling up and down stream for invertebrates with follow up lab analysis of species. This will be done to the standard protocol which is carried out across over 800 sites in the UK for comparison. Samples will be taken before beaver release and annually after.

### **c) Restoration of riparian and open water habitat and increased biodiversity along the river valley.**

The existing ponds on site are silting up, becoming overgrown with vegetation and are being encroached by the surrounding scrub willow. The willow and surrounding larger trees cast shade over most of the pond and as a result a thick layer of leaf litter is currently contained in these features. Their value for wildlife is therefore declining due to this process in combination with ancillary 'silting up', over-shading and nutrient retention from the leaf litter. **(Fig. 4)**

There are limited open water habitats in the Yorkshire Forest District. The utilisation of the natural habitat management abilities of the Eurasian Beaver in this area would predictably result in not only the long term survival of this complex of open water habitats but the additional creation of very many others in a cost effective and sustainable fashion. This would create a mosaic of ecologically diverse habitats throughout the length of the valley. The presence of retained conifer stands within the valley bottom will, as the beaver activity expands, result in the creation of a significant dead wood resource. This novel feature would ultimately benefit a wide range of species.

#### **Monitoring**

- Surveys of vegetation communities, habitat structure and deadwood will be carried out before and annually after release.
- Species surveys will be carried out this summer- including fish, amphibians, birds, small mammals (including bats), reptiles, dragonflies, aquatic invertebrates, fungi, bryophytes, butterfly and moths surveys and then annually after release.



**Fig. 4** The existing ponds (Little open standing water and much willow scrub encroaching)

#### **d) People and ecotourism.**

The project offers significant opportunities for a wide range of volunteers and educational establishments to be involved in the site surveys and future biological and hydrological monitoring. It offers good educational opportunities for local schools on a nationally significant project.

The site is in close proximity to a popular Forest Holiday cabin site, Keldy Cabins. With an increasing number of holiday cabin sites developing in the area the introduction of beavers to this site would provide a unique selling point for the cabins and ensure their long-term viability through the offer of opportunities to observe beavers in their natural environment and also observe the range of other species which will be attracted by the increasingly diverse habitats created by the beavers.

A simple hide will be constructed with log benches and 'Beaver watching' evenings could be offered by the Forest Holidays rangers/ local wildlife businesses following training and/or appropriate local wildlife guides. These have proved very popular in other areas of the country.

#### **Monitoring**

- The number of volunteers and their time spent on the project will be accurately recorded
- Numbers of people attending 'Beaver watching' events will be recorded through the trial period.

#### **e) Control of rhododendron in a riparian habitat.**

There is a large amount of rhododendron in the woodland surrounding the pond which is a remnant from the old Keldy Castle Estate formal gardens. The introduction of beavers in the area would allow us to measure their impact on this invasive species in a riparian habitat. This is currently unknown at present.

#### **Monitoring**

- The areas of rhododendron will be mapped before the release of the Eurasian Beavers and then periodically after.
- Changes in site hydraulic roughness will be monitored throughout the project.

### 3. Site Suitability

This project has been developed with the advice and support of Derek Gow, (Derek Gow Consultancy).

The site was assessed on a site visit with Derek Gow on the 21<sup>st</sup> February 2018 and has been considered highly suitable for a Eurasian Beaver enclosed release trial due to;

- a) Good habitat within the stream system and around the ponds with plentiful food and water supplies. The site covers 824m of the Sutherland beck and includes the site of 2 old fish ponds. The surrounding habitat is a combination of broadleaves and conifer plantation. There is much willow scrub around the area of the old ponds and young birch woodland along the beck side. There are open areas along the length to provide summer grazing for the beavers. (**Fig. 5** shows the range of habitats across the site in addition to the ponds pictured in **Fig. 4**)
- b) Capacity to install fencing at a far enough distance away from the watercourse and ponds to limit the chance/reason for beaver to undermine the fence and escape. (Approved 'Beaver' proof fencing will still be installed in accordance with the most up to date specification see section **4. Infrastructure specifications**).
- c) The presence of established man-made flood mitigation structures in the water channel will allow the study of the beaver's response to these and their impact on the long term sustainability. This research is unique to this trial project and it could provide an important option for a long-term sustainable maintenance solution for 'natural' flood measures.
- d) 6 years of flow data on the stream and rainfall data collected as part of the 'Slowing the Flow' Project. This provides a good level of baseline data to allow the project to effectively compare flows before and after release.
- e) The trial provides an opportunity to study the effect of Eurasian Beaver on the biodiversity of a section of an upland woodland/ moorland catchment system in detail before and after release.
- f) Easily accessible site

The site has been assessed to be large/diverse enough to support up to 15 individuals. The carrying capacity of the site will be reassessed annually by experienced personnel from Derek Gow Consultancy Ltd. to assess the quality of the habitat and the abundance of food materials in relation to the population.

**Fig. 5**





## 4. Infrastructure specifications

### Fencing

The exact specification for the fence in this project will adhere to the minimum standards set out in *The Eurasian Beaver Handbook* (Roisin Campbell- Palmer et al. , Campbell-Palmer and Rosell (2013) and the *Natural England advisory notes (draft) included in Appendix D of this handbook*) (**Fig. 6**) In addition we will take guidance from the best practice developed on other projects (Particularly the Forest of Dean)

Galvanised high tensile 8cm (3 in) mesh will be used. This will be of locked joint or weld mesh jointed type.

The fence will have an inward facing overhang to at the top to prevent climbing as in the Forest of Dean.

The fencing along most of the length of the perimeter will be set over 30m away from any friable bank-side habitat. It will be erected with a collar facing inwards at a 90-degree angle to the ground surface. A minimum 90cm skirt of netting will be buried and securely pegged to the ground on the beaver side of the fence and fitted to the vertical fence using hog rings to a height of 30cm. This will be of weld-mesh of similar specification to the lower part of the vertical fence.

Fence posts will be at least 210 cm in height with minimum 120cm above ground. Spaced at 4 metre intervals and positioned on the outside of the fence. High tensile wire will be strained at regular intervals across the height of the posts. Any internal strainers will be covered with weld mesh to prevent damage from beavers.

There will be a pedestrian access point at either end of the enclosure. Galvanised weld mesh /sheeting would be securely attached to the galvanised metal gate to prevent beavers climbing. A concrete pad will be laid between straining posts extending 50cm either side of the gate to prevent burrowing and ground compaction.



**Fig.6** Examples of beaver proof fencing to discourage digging, climbing and  
Left picture shows 90cm skirt and right picture shows anti-climb overhang at  
Forest of Dean. (Photo R. Campbell-Palmer)  
Final specifications will be agreed with Natural England on license approval.

## **Fence location**

The fence will mainly follow the line of the previous fence to the North and along a path to the South. The terrain and the distance that the fence is positioned from the watercourse will minimise the possibility of beaver attempting to burrow underneath the fence.

## **Tree removal/protection**

The fence along the North and South perimeters of the enclosure is for most its length 50-60m away from the watercourse and following advice received from Derek Gow Consultancy Ltd, this means that sizable trees close to the enclosure fence would not need to be removed in the first instance. The twice weekly fence checks will record any significant feeding sign in the vicinity of the fence and any felling or individual tree protection will then be organised as appropriate. At the Western and Eastern end of the enclosure any trees in the riparian zone of a size capable of causing a fence breach will be felled or protected with either a light weld mesh or anti-game paint. Any tree within 30m of the watercourse which could land on the fence when felled, throughout the whole enclosure, would also be treated in this way.

## **In water barriers**

The designs of the structures to be placed up and downstream of the enclosure and on the drains entering the site have yet to be finalised. Final designs will be designed and installed by Forestry Commission civil engineers according to best practice developed on other projects e.g. Forest of Dean in consultation with Roisin Cambell-Palmer and Derek Gow consultancy Ltd and will be approved by Natural England by October 2018.

A larger version of the grill shown in the picture **Fig. 7** will be set into the bedrock of the stream with an un-climbable set of bars to 1.2m in height on the top. Gaps between the grille bars will be wide enough to impede beaver access but not as narrow as to impact on fish and otter passage. These will be installed with the required approvals from the Environment Agency and North Yorkshire Flood Alleviation team.

Upstream, where the structure meets the fence and for 20m either side of the watercourse the mesh skirt will be extended and the bank protected with weld mesh to ensure that the banking around the grill is burrow proof.

To prevent the beavers damming the bottom grill a mesh box will be built around the grill to protect it (ensuring access for cleaning) -like at the Forest of Dean. (**Fig.8**) This would be designed in consultation with Roisin Campbell-Palmer. The mesh box would work to protect the banks around the grill from beaver burrowing, provide a second line of defence from escape and also prevent them damming the grill. The mesh box would ensure that any new water lines created by the beaver would be kept off the fence line. For 20m either side of the watercourse the mesh skirt would be extended. A line of wooden posts would be placed across the stream 10-15 metres upstream of the mesh box to catch debris.



**Fig. 7** Beaver Grille.  
Photo. G. Schwab.



**Fig. 8** Mesh Box at the Forest of Dean  
(Designed by Roisin Campbell-Palmer)

## Drain protection

There are 4 open drains entering the enclosure from the North. Culverts will be put in each of these drains along the fence line.

Metal grilles (**Fig. 8**) will be designed to protect the culverts and to ensure that they cannot be undermined by beaver burrowing. This will be accomplished by either setting them into a concrete base or by constructing their main bars as rods (~1m long) which are then driven down into the stream bed. They will then be fixed firmly into the banks or to the pipe itself with wire ties to ensure that beavers cannot burrow around the main barrier.



**Fig. 8** Metal grilles to protect culvert. Robust bank meshing and heavy set grille which is fixed to bank side and stream bank to withstand beaver digging around inflow.  
Photos: R. Campbell-Palmer.

## Maintenance

A regular maintenance regime will be established to ensure that the grilles and fence line are checked twice weekly by FC staff or trained volunteers to look for signs of burrowing, undermining or detritus blocking the structures.

# **Method Statement Beaver Release**

## **The Beavers**

There are 3 potential sources for the beaver for this project

1. Captive if available (either sourced from British collections or European surplus Zoo animals)
2. Translocation from wild in Scotland – under licence from SNH. Beavers in Scotland are in favourable conservation status and the animals would be taken from areas where lethal control is being employed.
3. Translocation from wild in Continental Europe. This would be done under licence of the appropriate authority in that country and would be from areas where their presence is not tenable for land drainage reasons and where lethal control is being employed and would be done according to any statutory quarantine and health screen requirements.

All beavers released will be from the same family group. It is the projects intention to release if available a structured family group – an adult breeding pair, their yearling offspring and babies of a given year – which could amount to up to 8 individuals.

The source of the beavers will be confirmed by the end of October to allow adequate time for quarantine if necessary.

## **Transportation.**

The beavers will be transported as per the 'Captive Management Guidelines, Eurasian Beaver (Castor Fiber)' (Roisin Campbell-Palmer and Frank Rosell 2013)

They will be transported in specially-designed beaver crates which have been developed for transporting beavers in England and from Germany to the UK with no fatalities to date. They are approximately 80 x 58 x 58 cm, constructed from  $\frac{3}{4}$  inch marine ply and are open at both ends. The sides are lined internally with sheet tin or half inch weld-mesh. The sliding doors at either end are constructed from heavy-gauge 2 inch weld-mesh set in runners. The crates have carrying handles fixed onto the tops of the frames at both ends.

These crates would be used to transport the beavers; they would be covered but well ventilated in order to reduce stress to the animals in transit, transportation would be avoided in extremely hot periods. If sourced from Continental Europe the beavers would then be quarantined on entering the UK according to animal health and disease control legislation at the approved facilities at Derek Gow Consultancy Ltd, Upcott Grange, Broadwoodwidge, Devon.

On completion of quarantine the beavers will be transported in the same crates to Yorkshire for the release into the enclosure.

## Release

To assist the beavers in settling in to their new site an artificial lodge will be built close to the ponds out of timber and straw bales similar to the one built in the Knapdale releases in Scotland (**Fig.9**).

**Fig. 9**



The artificial lodge provided for Alba © Scottish Beavers

Upon arrival at the enclosure the beavers will be released into the pre-constructed artificial lodge structure and held within there for 2 days prior to being let into the wider enclosure sufficient food will be placed inside the artificial lodge for this period.

The timing of the release is in spring to enable the released animals to establish territories, build shelters and have ready access to food supplies so they can prepare for the colder winter months when food is less available.

## Health and wellbeing

If the beavers are sourced from continental Europe all animals to be released will be quarantined as necessary. The animals will be screened during quarantine to the current standard required by the Animal and Plant Health Agency which currently includes; *Leptospirosis*, *Giardia*, *Cyptosporidium*, *Tuleramia*, *Echinococcus* ' *Hantavirus* , *Bovine tuberculosis*, *Rabies*

The DEFRA "Importation of European beaver from Europe: Voluntary Code of Practice, April 2014" will be followed. Each animal will be physically inspected by a vet (Adrian Oliver MBA, BVSc, MRCVS, Penbode Farm Vet, North Road, Holsworthy, Devon, EX22 6HB) to check they are physically healthy before release.

If the beavers are to be sourced from Scotland or a captive bred population the animals would be health screened at source, before transportation to site, for *Cryptosporidium*, *Giardia*, *Hantavirus*, *Bovine tuberculosis*. This would be undertaken by the Royal Zoological Society of Scotland.

The beaver's health and wellbeing will be monitored by trail cameras across the site – looking for normal behaviour and feeding, the animal's locomotion and weight and for any obvious injuries/ abnormalities in the beaver. If any

abnormalities are spotted advice will immediately be sought from Derek Gow Consultancy Ltd. The beavers will be trapped and examined for health and weighed annually an experienced handler from Derek Gow Consultancy Ltd.

If any beavers die during quarantine or during the life of the project, the carcasses will be submitted to the Animal and Plant Health agency for post-mortem examination.

### **Beaver and Population monitoring**

As recommended by 'Captive Management Guidelines, Eurasian Beaver (Castor Fiber)' (Roisin Campbell-Palmer and Frank Rosell 2013), each beaver will be tagged with 14mm sub-cutaneous microchip PIT transponder and plastic ear tags to allow identification of individual animals.

Monitoring of the animals within the enclosure will be carried out using trail cameras to the same specification used by the partner organisations for the Scottish Natural Heritage, licenced beaver trial in Knapdale, Kintyre. These will be placed at the upstream downstream grilles to monitor beaver activity in these areas and at other locations of activity throughout the enclosure.

Individual animals will be monitored as far as possible with the trail cameras and greater investigations will be undertaken if animals are not seen for an extended period of time; including baited stations, extra fence line checks and searching of enclosure for cadavers

Beavers will be trapped on an annual basis to allow new seasonal offspring to be tagged and to allow any population expansion to be monitored.

The maximum predicted number in the site would be 15. The carrying capacity of the site will be reassessed annually by experienced personnel from Derek Gow Consultancy Ltd. to assess the quality of the habitat and the abundance of food materials.

It is not anticipated that during the 5 years of the project that the population will exceed the carrying capacity of the site. If this does occur then individuals over 2 years of age will be trapped and removed from the enclosure and be taken to Derek Gow Consultancy Ltd holding facility Upcott Grange, Broadwoodwidge, Devon.

## **6. Managing escapes**

### **Reducing risks of escapes**

The fence has been specifically designed to prevent egress by beavers. The inflow and outflow will be secured using steel grills and weld mesh to prevent burrowing into banks in close proximity to the culverts. The fence line and grilles will be checked on a weekly basis by Forestry Commission staff or trained volunteers to ensure no damage has occurred through falling trees or vandalism. Checks will additionally take place after high wind or rainfall events. The fence and culverts will be carefully checked before any beavers are released into the enclosure.

Beavers are known to mainly use the area within 20m of a watercourse. The Sutherland Beck affords a significant abundance of highly suitable living space for the species within this 20m corridor. Moving further away from the watercourse, but still within the fence, the terrain steepens and the habitat becomes less suitable. This will reduce the risk of potential escapes.

Once the beavers are established and settled on site with an effective lodge, dam systems, and a regularly used canal and path network it is highly unlikely that any short term breach in the fence will result in any likelihood of escape. At the enclosed Beaver Trial site in Devon there is no visible evidence that the beavers in the central wetland are exploring the fence line at all.

The watercourse selected for the release (Sutherland Beck) runs into the Cropton Beck which ultimately runs into the River Seven. 1140ha of the River Seven catchment lies within Cropton Forest which is owned and managed by the FC so the likelihood of impact on neighbouring land owners is much reduced.

### **In the event of escape**

Forestry Commission staff in Yorkshire Forest District and volunteers will be trained in advance of the beaver release to ensure a much wider body of competent individuals are available to assist in the event of escape.

A wider awareness programme to advise residents of properties, farmers, dog walkers and other riparian users of beaver field signs will be instigated by the Forestry Commission.

If an escape is confirmed, Derek Gow Consultancy Ltd will be informed as soon as it is identified. Neighbouring landowners and the relevant authorities will also be informed.

The connecting watercourse will be surveyed for the field signs of *beavers e.g. felled trees, regularly used paths emanating from a water body into the surrounding landscape, wood chips and tracks.*

A secure storage facility within Cropton Forest GR SE75619198 (1.4 miles on forest roads from site) containing traps, nets and transport crates will be present within the district. These traps will be quickly deployed by either Derek Gow of the Derek Gow Consultancy Ltd (a lead partner organisation in the Devon Beaver Trial) or Roisin Campbell Palmer the former manager of the Scottish Beaver Trial. Both of the forgoing individuals have extensive experience in both Britain and continental Europe of live trapping beavers successfully.

A significant number of scientific studies in North American and Europe demonstrate that beavers are very slow colonisers between catchments which are not interconnected by water through an estuary, canal system or other linked feature. It is therefore highly likely that in the event of any escape that the beavers would be retained in the catchment of the River Seven by topography. Once their locations of residence had been identified recapture could then readily follow. The live capture traps would be set at visible areas of activity. As appropriate these traps, which will be checked twice daily, will be baited with desirable food or the scent of other beavers.

Once trapped the beaver(s) will either be relocated back to the enclosure or removed to another secure captive breeding site in England.

The forgoing is a well understood process in both a Scottish and European Context. Both Derek Gow and Roisin Campbell-Palmer are established species experts who have jointly with co-authors produced an English language, Beaver Management manual which was published by Pelagic Books in 2016.

## **5. Exit Strategy**

It is hoped that the beavers would be able to stay in the enclosure after completion of the 5 year trial. If this was not possible or the trial had to be finished early then the beavers would be trapped by Derek Gow or Roisin Campbell- Palmer of Derek Gow consultancy Ltd. and returned to the holding facility at Upcott Grange, Broadwoodwidger, Devon.

## 6. Consultation

### External Key Stakeholder consultation

Slowing the Flow Group – Letter sent 17<sup>th</sup> May and Alan Eves (Yorkshire Forest District Manager) spoke to group chair Jeremy Walker. The project will be discussed in detail at the next Slowing the Flow Board meeting in September. Representatives from the Slowing the Flow Board are listed below.

<b>NAME</b>	<b>POSITION</b>
<b>A Wilson:</b>	Chief Executive, NYMNPA
<b>Brian Baker:</b>	Town Clerk, Pickering
<b>Andrew Newton:</b>	Humber Programme Manager, EA
<b>Andrew Scott:</b>	
<b>Crispin Thorn:</b>	Area Director, Forest Services Delivery
<b>Robert Burnett</b>	Manager, Yorkshire and N Lincs, NE
<b>Wendy Quarrie</b>	Natural Flood Management Lead, PSO Yorkshire North & East
<b>Alan Eves:</b>	FDM, YFD, FEE
<b>Gareth Dadd:</b>	Cllr.
<b>Derek Waters</b>	Geoff Richardson - retired
<b>Jeremy Walker:</b>	Chairman, STF Partnership Board
<b>Emily Mellalieu</b>	NYCC (Replacement for Mark Young )
<b>Neil Longden</b>	Flood & Coastal Risk Manager, Yorkshire, EA
<b>Tom Nisbett:</b>	Programme Group Manager, FR
<b>Paul Murby:</b>	Defra
<b>Beckie Bennett</b>	RDC
<b>Roger Hudson:</b>	Chairman, Sinnington Parish Council
<b>Ruth Ashton-Ward:</b>	Flood and Coastal Risk Management Team, Defra
<b>Martin Baxter</b>	Chair -Sinnington FAG
<b>Jamie Letts</b>	EA - secondment (Since Vince retired)
<b>Phil Roe:</b>	FEE

Alan Eves has also spoken to Andy Wilson from the North York Moors National Park who is very supportive of the project.

Environment Agency - Richard Jennings allocated as key contact. Papers sent to Richard on 25<sup>th</sup> May 2018. Cath Bashforth – Yorkshire Forest District Ecologist discussed project on 30<sup>th</sup> May.

### Secondary Consultation (Consultation to start after license granted)

NFU,

CLA

GWT

Yorkshire Wildlife Trust

Yorkshire Water

Local Fishing groups

Local Communities and residents

Forest Holidays

**Additional groups to consult with to source specialists for surveys**

North and East Yorkshire Data Centre (NEYDC)

Yorkshire Mammal Group

Scarborough Field Naturalists

Ryedale Natural History Group

Forest Bird Study Group

Pondlife

Yorkshire Dragonfly society

North East Fungi Group

**Site specific surveys are currently underway for a wide range of species**

## Draft Time line

	March 2018	April	May	June	July	August	Sept	Oct	Nov	Dec 2018-Feb 2019	Spring 2019	
<b>Consultation</b>	Paper submitted for internal approval		External Consultation with Key Stakeholders			Production of leaflet for secondary stakeholders						
<b>Research</b>		YFD visit to Devon Beaver site and Derek Gow	Wildlife Ranger visit to Bavaria			YFD visit to Forest of Dean			FC staff training on beaver trapping and monitoring FC staff and volunteer training in fence/ grill check			
<b>Application</b>		Prepare license application for NE	License application to NE									
<b>Surveying</b>			Recruit volunteers for surveys	Site Biological surveys			Finalise Hydrological monitoring and installation of equipment	Initial Drone fly-over				
				Tom Nisbet FR and Dr Richard Brazier, Exeter Uni to visit site	Map Rhododendron/ deadwood							
<b>Beavers</b>								Finalise source of beavers	Derek Gow to source beavers, transport to UK and quarantine if necessary	Construction of Artificial lodges	Beavers released	
<b>Funding</b>		Investigate funding opportunities				Finalise funding						
<b>Comms.</b>			Set out comms/ media plan				Pre fencing interpretation on-site			Development of final on-site interpretation	Installation of on-site interpretation	
<b>Fencing/ infra-structure</b>						Installation of 3 new wood dams			Installation of barriers upstream and downstream		Pre – release fence Check	
						Site visits with fencing contractors to get more accurate price per metre	Design of the barriers up and down stream and ditches to prevent beaver escape working with Roisin Campbell Palmer					
						Set up fencing contract	Clearance of fence line and on site fencing					

## Monitoring 2019 – 2024

Twice weekly fence and grill checks

Regular beaver welfare checks using trail cameras and annual trapping to monitor population and health

Objectives monitored as per descriptions in main text.