Beavers *Castor fiber* in Wyre

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The Eurasian Beaver (*Castor fiber*) is a large (15-25kg) semi-aquatic, herbivorous rodent with a head and body length of ~80cm and a tail length of ~30cm in adults (Rosell and Campbell-Palmer, 2022). They have the ability to restore wetland habitats and provide habitat for declining species, whilst making an impact on slowing the flow of water downstream. Eurasian beavers were hunted to extinction for their fur, meat, castoreum (a secretion from their castor glands) and bones. From the 15th century, trade in their fur was no longer economically viable due to overexploitation and their presence began to fade from folk memory. While we will never know when the last British beaver was killed, a church ledger record from the village of Bolton Percy near York in 1780 records the payment of a bounty of 'tuppence' for the head of a beaver (Coles, 2006). They eat mixtures of shoots, leaves, bark and aquatic vegetation. During spring and summer, up to 90% of their diet is composed of terrestrial, semi-emergent and aquatic species of plants (Nolet *et al.* 1994).

Although beavers can fell quite large trees (up to 1m in diameter), they tend to favour smaller saplings (less than 5cm diameter) in order to obtain their bark, side branches and leafy stems. Favoured woody plant species include Aspen and Poplar (*Populus spp.*), Willow (*Salix spp.*) and Rowan (*Sorbus aucuparia*), while Alder (*Alnus glutinosa*) which is generally avoided, can be felled and utilised where it is the dominant species present (Haarberg and Rosell, 2006).

Their digestive system contains a large number of micro-organisms and flukes (parasitic flat worms) which help them to digest their nutrient-poor diet, and they also re-ingest some of their faeces to extract a greater percentage of the nutrients from their food.

Beavers are monogamous and can typically have two or three kits each year with a gestation period of just over 100 days. They will usually break away from the family group at around 2 years old and breed from around 3 years old.

The beaver project at Wyre Forest started off as an idea after a site meeting at the experimental pool.The Forestry England (FE) beat team and senior management were looking at the positive natural flood management work installed through the valley, working in partnership with Wade Muggleton from Worcestershire County Council.

After initial talks with the Wyre Forest National Nature Reserve team at Natural England (NE) and the Senior Forestry England Ecologist for the District, a feasibility study was prepared by staff from The University of Exeter and The Beaver Trust. This highlighted a suitable area and looked beyond the valley of the Experimental Pool to include Dowles Brook (later dismissed due to inability to contain beavers). Most of these water courses showed quality riparian beaver habitat which made the site suitable for an enclosed release.

Once the report was approved, FE applied for the correct licence, including consulting various bodies - Shropshire Council, (NE) and the Environment Agency (EA). This would include a specified type of fence and with this in mind staff sought advice from other FE beaver sites including The Forest of Dean and Pickering (the latter having beavers in an enclosure since winter of 2018) to find out what worked and more importantly what did or did not work for them, especially due to the fact that fencing areas with running water courses is a challenge. The fence criteria include a minimum height of 120cm vertically with a 50cm section at 45 degrees as an anti-climb device. In addition, a minimum 90cm ground skirt of netting is laid on the floor which deters digging at the fence line. The Wyre enclosure was adapted to include a vertical fence of 180cm due to the deer population within the forest to increase the security of the fence line. In addition to the fence line, at the areas of constant flowing water, a grill system was required to allow a greater volume of water to pass, along with any mammals and fish. A frame of angle iron and reinforcement bars were used on the two inflows and single outflow at the southern end of the site. The reinforcement bar of 300cm in length was piled into the silt bed giving approximately 200cm of the bar underground. This, along with a ground skirt would prevent beavers digging through and escaping (Figure 1).

As part of the project's progress, neighbouring land


Figure 1. Outflow grill construction. Stewart Carter

owners were contacted with details of the project and the enclosure. In the event of escape, FE & NE would trap and return them to the enclosure.

In March 2024 a family of six beavers (two adults and four kits) were ready for release having been relocated from Scotland to a holding facility where health checks were carried on the family. Prior to the release Rob Needham (Beaver Trust) walked the enclosure to give a final inspection and list any snags to be make good. A release area was required to include a man-made lodge and pool created for the animals to have a safe sheltered area. The NE and FE teams from Wyre worked on one of the leaky dams (Figure 2) to increase the height of the water level and also felled material to make a temporary lodge (Figure 3).

With all the preparations complete, the family of beavers arrived. Getting the crates down the steep slopes was no mean feat but slowly and gently they were moved to the edge of the release pool. Always in mind was the welfare of the animals keeping them as calm as possible (Figures 4 and 5).

Beavers do one of two things when released at


Figure 2. Leaky dam improvement. Stewart Carter


Figure 3. Temporary lodge. Stewart Carter

a new site. They either bolt to the water and are almost never seen for days after or gently step out to take in the surroundings. Luckily for the us they did the latter, slowly appearing and discovering their new home, taking to the water and not in a hurry to get away from their human audience. After an hour of observing the family, the team left the enclosure. After a long winter of work to get to this point of release it was a triumph to see the beavers content in their new surroundings.


Figure 4. Release day. Stewart Carter


Figure 5. Beaver kits in their crate. Stewart Carter

Motion activated wildlife cameras were placed at several spots across the site, most importantly at the inflow and outflow grills to monitor all wildlife movement and the beaver's reaction to the grill. It soon became apparent the beavers were quite content with their new habitat. All wildlife cameras were activated over the first few nights, showing they were travelling over the whole site, discovering what their environment was like.

In addition to the beavers in the enclosure, several other ongoing monitoring projects have taken place including, bats, birds, small mammals, and stream fauna. Due to time constraints the EA was unable to electro-fish the stream length before the spawning season. However, it is still a desire of the EA and FE to get this carried out. Improvements to allow migratory fish from the River Severn and Dowles Brook and into the stream of the beaver enclosure have been suggested by the EA. This would involve graduating the water course that runs from the concrete pipe under the forest road heading to the Dowles Brook, to allow fish to pass (Figure 6).


Figure 6. Forest road culvert. Stewart Carter

The enclosure has also created a haven for wildlife without the immediate pressure of the forest users. The wildlife cameras have captured an abundance of species including, dipper, wagtail, kingfisher, otter, stoat, fox, goshawk, tawny owl, wood mice, rats and buzzard. As part of the licence commitment regular fence checks must be completed to watch for signs of burrowing, internally and externally. There have been numerous signs of digging at the grills (Figure 7) however the bars are not passable and the digging soon stops.


Figure 7. Digging at the grill. Stewart Carter

Additional monitoring methods include setting out food, usually apples or carrots, with two wildlife cameras pointing at the food (Figure 8). This provides two angles on the beavers to check on signs of injury and overall visual health.


Figure 8. Feeding station. Stewart Carter

Ten months later and the site has been transformed with several dams being created (Figure 9). This is most evident at the experimental pool area, where initially a dam covered the stream bed raising the water up by 70cm creating a pool behind it. From this waterline there are burrow signs into the steep bank and also feeding signs from stripped stems felled by the beavers.



Figure 9. Newly constructed dam. Stewart Carter

They have fed on small stems of most woody species found within the enclosure including, hazel, willow, aspen, ash, western hemlock and oak. These stripped sticks have then been used in the dam construction. They have also taken to working on larger species. An ash tree of 35cm diameter was felled and the top of the tree stripped (Figure 10).



Figure 10. Felled Ash tree. Stewart Carter

A few challenges have had to be addressed over the winter months due to the high volumes of water channelling through the valley. This brought excessive amounts of debris to the inflow grill putting severe pressure on it to the point of forcing over the grill and section of fence.

Luckily no beavers could get through due to the torrent of water spilling over the damaged grill. Staff quickly made a temporary repair and later installed a upgraded grill which could cope with higher pressure of water and debris when the stream is in spate. Staff do have to clear out the inflow grill from occasional debris, but throughout the valley, the mixture of beaver dams and leaky dams are catching large amounts of debris and holding back large volumes of water.

Staff sat out several times throughout 2024 using thermal imaging scopes to aid spotting the beavers as quite surprisingly they are rather elusive. They come out of the lodge usually at or after twilight, although the cameras have spotted them throughout day and night. The cameras have only managed to pick up five beavers at any one time including the two adults. Trying to monitor these elusive rodents without trapping is a challenge but monitoring will continue with feed stations set out periodically. With luck the adults will have bred again, and newborns will arrive in 2025. Initially there will be no concerns with the new additions to the enclosure but in the future it is likely that the siblings introduced in 2024 may be relocated to new release projects depending on how they all interact as they mature.

The momentum of the beavers' progress from March to December 2024 has been impressive, the change of the Experimental Pool area is significant and with spring on the horizon it will be fascinating to see how plants re-establish throughout the valley. Some signs of coppice regeneration are already evident. Over time it is expected the dams will improve, with strength and materials being able to stand up to the increased flood water the forest has experienced. Although, from a beaver's point of view, repairs on the dams are done with speed and efficiency, taking little time to return the water levels to their desired height!

References

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