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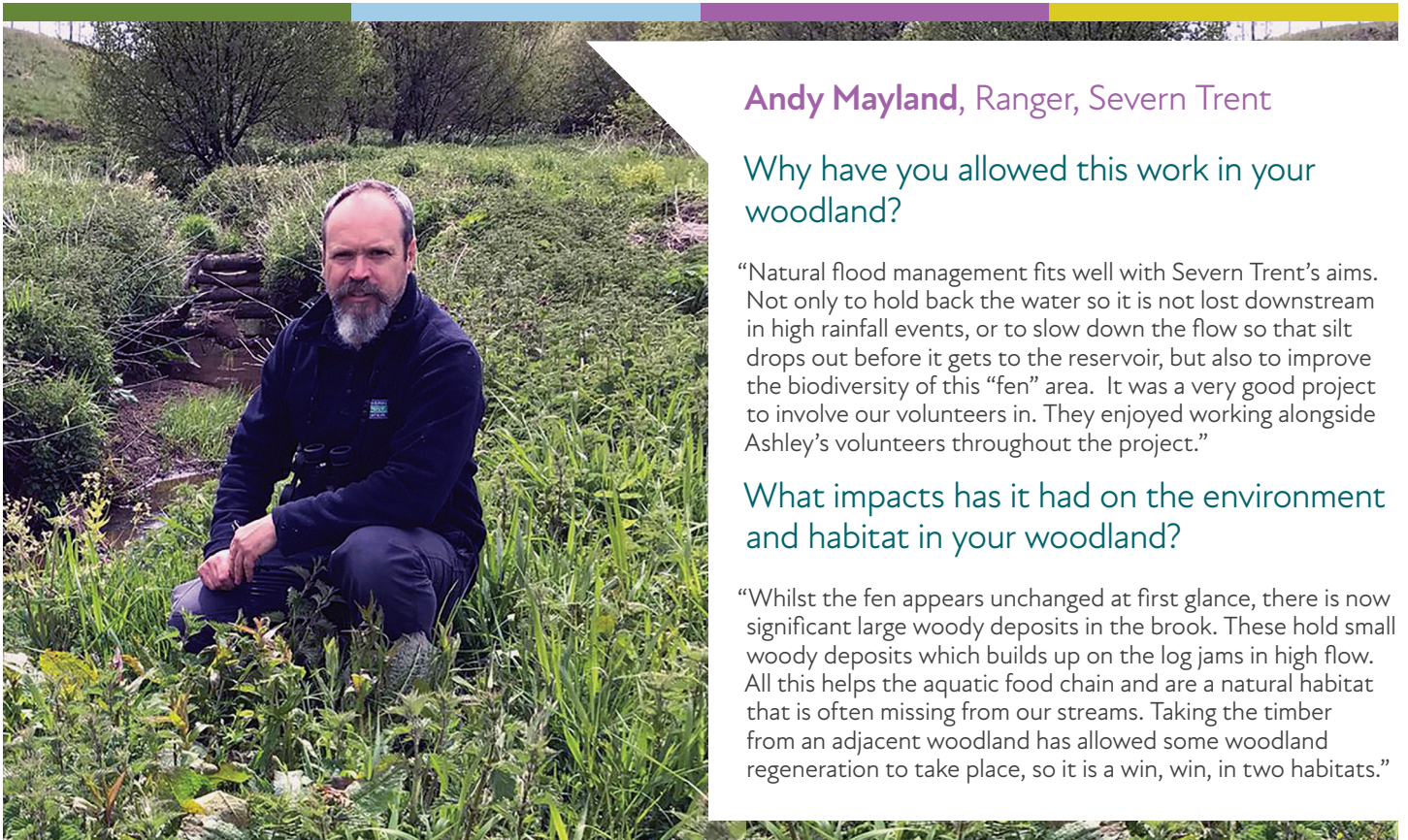
Location: Firth Bottom Fen, Tittesworth
Water course: Meerbrook
Sub-catchment: Churnet, Upper Dove



The fen is owned and managed by Severn Trent Water.

There are no public or permissive footpaths through the site and none of the interventions can be seen by the public.

The installation of the dams was linked intrinsically to woodland management in the immediate vicinity. The wetland habitat is adjacent to a plantation woodland which required thinning work. This provided the timber for creating the leaky dams. The trees were felled by trained arborists who prepared the timber into 4m lengths so that it would span the channel (with a third of the timber extending the width of the channel into the banks each side). Extraction of the timber from the woodland was achieved using volunteers. Once the timber was out of the woodland, a quad bike, on floatation tyres, was used to transport the timber along the stream to the locations of each leaky dam. The installation of each timber dam was done using volunteers and no machinery tracked across the habitat to build the dams. Instead, each structure was done by hand. This was achieved by digging a slot on each side of the stream and lowering the timbers into the slot to create a leaky barrier. This enabled each structure to be 'keyed' into the bank. The base of each dam was situated above base flow so that during low flow conditions water could pass unimpeded beneath the structures. Non-tanalised fencing stakes were then knocked into the ground in each bank adjacent to the timber so that the dams cannot move downstream under high water pressure. Each timber length was secured to the stakes using plain wire and fencing staples. The slots were then backfilled with soil on each side to ensure the timbers were anchored into the river banks. Each dam was located strategically in the channel to maximise engagement of peak flows with the flood plain. They were keyed into the channel in locations that would encourage the most water out of the channel and therefore provide the most storm-water attenuation during heavy rain-fall events.



Andy Mayland, Ranger, Severn Trent

Why have you allowed this work in your woodland?

“Natural flood management fits well with Severn Trent’s aims. Not only to hold back the water so it is not lost downstream in high rainfall events, or to slow down the flow so that silt drops out before it gets to the reservoir, but also to improve the biodiversity of this “fen” area. It was a very good project to involve our volunteers in. They enjoyed working alongside Ashley’s volunteers throughout the project.”

What impacts has it had on the environment and habitat in your woodland?

“Whilst the fen appears unchanged at first glance, there is now significant large woody deposits in the brook. These hold small woody deposits which builds up on the log jams in high flow. All this helps the aquatic food chain and are a natural habitat that is often missing from our streams. Taking the timber from an adjacent woodland has allowed some woodland regeneration to take place, so it is a win, win, in two habitats.”

Consents:

The works at this site required the following consents:

Land Drainage Consent

Under Section 23 of the Land Drainage Act 1991 permitting works that may impede the flow of a water course. Issued by Staffordshire County Council.

Felling licence

Issued by the Forestry Commission under the Forestry Act 1967 permitting the felling of trees for any purpose that falls outside the exemptions listed by the act. In this case, the felling licence was part of an existing woodland management plan agreed with the Forestry Commission.

Section 28 of the Wildlife and Countryside Act

This act is in place to ensure wildlife, species and habitats are protected against disturbance and habitat degradation. As the work was also within the Peak District National Park consultation with the PDNPA was also required.

Why was the work needed:

The stream running through this site was highly incised and very disconnected from the flood plain. The silt regime was poor and had disproportionate quantities of fine sediment loading. The flow rates were high after heavy rain but the degree of bank incision prevented the turbid waters from readily connecting with the fluvial silt deposits on the flood plain. By creating leaky woody barriers, the stream now has more resistance to high flows as water backs up behind the features and spills out more readily onto the banks throughout the wetland habitat. As this stream feeds a reservoir this work also facilitates the reduction in silt arriving in the reservoir reducing treatment costs.

Benefits:

Leaky woody dams have multiple benefits. Firstly, and crucially, these dams reduce flow rates meaning peak flow conveyance is much slower. Secondly, they have a localised positive impact on the amount of silt suspended in the water column as they push flood water out onto the flood plain where silts can be deposited readily. Woody dams also provide positive benefits for aquatic wildlife too as they create habitat for many invertebrates, fish, lower plants and fungi. Woody material in watercourses serves as a resource for ‘shedders’ and ‘decomposers’ amongst the invertebrate populations, which they can convert into a form that other wildlife can utilise further up the food chain. Woody dams can also provide a foraging perch for riparian birds such as dippers and wagtails. The benefits span much further than just Natural Flood Management and slowing the flow.

Construction data:

- 15 LWD leaky dams
- 400 m of watercourse providing storm water attenuation

Costs:

- 14 days FTE labour, 32 days volunteer labour, materials at a total costs of £6762.50 (ex VAT)
- Number of structures: 15
- Cost per structure: £450.83 (ex VAT)