## **CASE STUDY:** Whitelee Farm

Whitelee Farm is a mixed livestock family farm in the headwaters of the Dane Valley near the village of Wincle. Cattle and sheep grazed fields are bounded by species rich hedgerows which offer almost complete contiguous connectivity between established woodland habitat. The streams on the farm each flow through Priority Habitat of Deciduous Woodland, some of which is Ancient Replanted Woodland.

Location: Whitelee Farm, Wincle Water course: Unnamed tributaries of River Dane Sub-catchment: Dane, Upper Weaver-Gowy



### **Ownership:**

The farm is owned and managed privately.

### Access:

Whitelee Farm can be accessed by public and permissive footpaths. Some of the interventions can be seen from the footpaths.

### About the project:

The aim of the project was to enhance the landholding for wildlife but also to provide natural flood management resilience within the landscape. The project delivered in-channel work to restore natural stream processes within the minor tributaries across the farm which flow into the main river. This was in the form of 12 Large Woody Debris (LWD) log jams and 8 leaky dams. Additionally, 2 offline storage ponds were created in the microflood plains of one of the valleys which facilitated peak flows engaging with the flood plain. To complement the in-channel work, 550m of contour hedgerows have been restored with a species-rich planting mix inside a 2.5m fenced of buffer zone. This buffer intercepts overland flow and reduces the amount of run-off reaching the river.

### How it was achieved:

The felling work was designed to mimic natural processes as much as possible. Bank side trees were selected to create engineered log jams; sycamore, hazel and birch were targeted



for use in the jams. Each jam was made up of between 2-3 trees per jam and were felled directed into channel to create an interlocking lattice. The branches and woody material of each tree deliberately meshed together to reduce mobilisation risk during high flows. This work was carried out using trained arborists to fell the trees. The technique used here has been described as the 'Chop n Drop' approach which seeks to mimic windblown trees enabling the aquatic habitat to be restocked with woody material. The leaky dams were created in a more formal engineered fashion. Bankside material was felled and snedded to create linear timber pieces for use in the construction of the dams. Each timber was keyed into the banks either side using stakes and wire, and were set above base flow to allow low-flow conditions to pass unimpeded beneath the structure. The offline storage ponds were dug in the flood plains of the valley with spillways installed to encourage directional flow of flood waters into the ponds. The hedges were reinstated via coppicing some of the old standards; the former hedge had become an over-mature line of trees, so some of the overmature specimens were coppiced whilst leaving a standard every 30 m. A double line of fencing could then be installed either side of the hedge ahead of planting. Hawthorn, blackthorn, hazel, dog rose and crab apple were planted with 5 whips per m, caned and spiralled for protection against browsing pressures.

### Consents:

The works at this site required the following consents:







info@cheshirewt.org.uk www.southwestpeak.co.uk/projects/ natural-heritage/slowing-the-flow



## Jenny Marsh, Landowner

### Why have you allowed this work in your woodland?

"For some years we have been improving the environmental aspects of the farm with our own initiatives, through the auspices of the Dane Valley Catchment Area and latterly with the help of the Upper Dane Facilitation fund. When Ashley and her team introduced us to the idea of Slowing the Flow, by the partial damming of our fast flowing streams which run through deep valleys in our woodlands straight into the river Dane, we were keen to explore possibilities. Not only would this help control flooding in our area but also down river. In addition it would help prevent erosion in the longer term and improve conditions for the flora and fauna."

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

"The dams have already been seen to be effective during heavy rain. They were built using previously fallen trees and a limited number of felled non-native species so bringing more light to the undergrowth but at the same time leaving woody debris providing a natural habitat. We look forward to continuing to see the benefits of the work as the years go by."

### 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 Cheshire East 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 along with consulting other statutory organisations such as Natural England.

### Why was the work needed:

The site had a number of fast flowing stream which all had low woody material content. There was scope for improving the micro-floodplain connectivity and fluvial processes. Water moves very quickly through the landscape when there is little surface roughness such as rank vegetation, woodland or hedgerows. It continues to makes its way quickly into the river network if streams don't have any resistance to fast flows. This work all contributed towards delaying the rate at which water moves through the landscape. Additionally the hedges not only help to reduce run-off rates, but they also provide a vital corridor for invertebrates, birds and small mammals to migrate through the wider countryside between habitat fragments.

### **Benefits:**

LWD plays a crucial role in river habitats. It provides refuge for invertebrates and fish, as well as improving the riparian habitat for other wildlife such as birds and mammals. It engineers habitat diversity and biocomplexity. The in-channel work at this farm also collectively help to reduce flow rates. Additionally, the sediment regime is also positively impacted by reinstating natural processes for capturing fine sediment and cleaning spawning gravels. The over-land flow inception hedgerows not only provide the benefit of reducing overland flow and in turn capturing silt, but they also provide a fantastic habitat for wildlife. Species rich hedges provide fruit and flowers throughout the season providing food for invertebrates, birds and mammals year round. They also offer a refuge and shelter from predation for small mammals and birds, and provide a 'super highway' for wildlife to use for migrating across the landscape. The hedges in this instance linked up existing woodland blocks and other hedges facilitating mobility of species from one fragment to another.

### **Construction data:**

■ 12 LWD log jams restoring 700m of watercourse with LWD

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- 10 LWD leaky dams providing storm water attenuation along 200m of watercourse
- 2 offline storage ponds
- 550m of restored hedgerow

### Costs:

- 12 LWD log jams: 3 days FTE labour, 5 days of arboricultural contractor labour at a total costs of £1900 (ex VAT) = £158 (ex VAT) per structure
- 10 LWD leaky dams: 4 days FTE labour, 13 days volunteer labour at a total costs of £2300 (ex VAT) = £230 (ex VAT) per structure
- 2 offline storage ponds: = 2 days of excavator contractor labour and materials at a total cost of £650 = £325 (ex VAT) per storage pond
- 550m of restored hedgerow: 2 days of landowner felling and coppicing, fencing contractor fees, 2 days FTE labour, 17 days volunteer labour at a total cost of £9475 (ex VAT) = £17.22 (ex VAT) per m of restored hedgerow





