Townfoot
River restoration for natural flood mitigation and biodiversity

In late 2019, the team conducted a walkover of Townfoot Farm (near Cumrew).
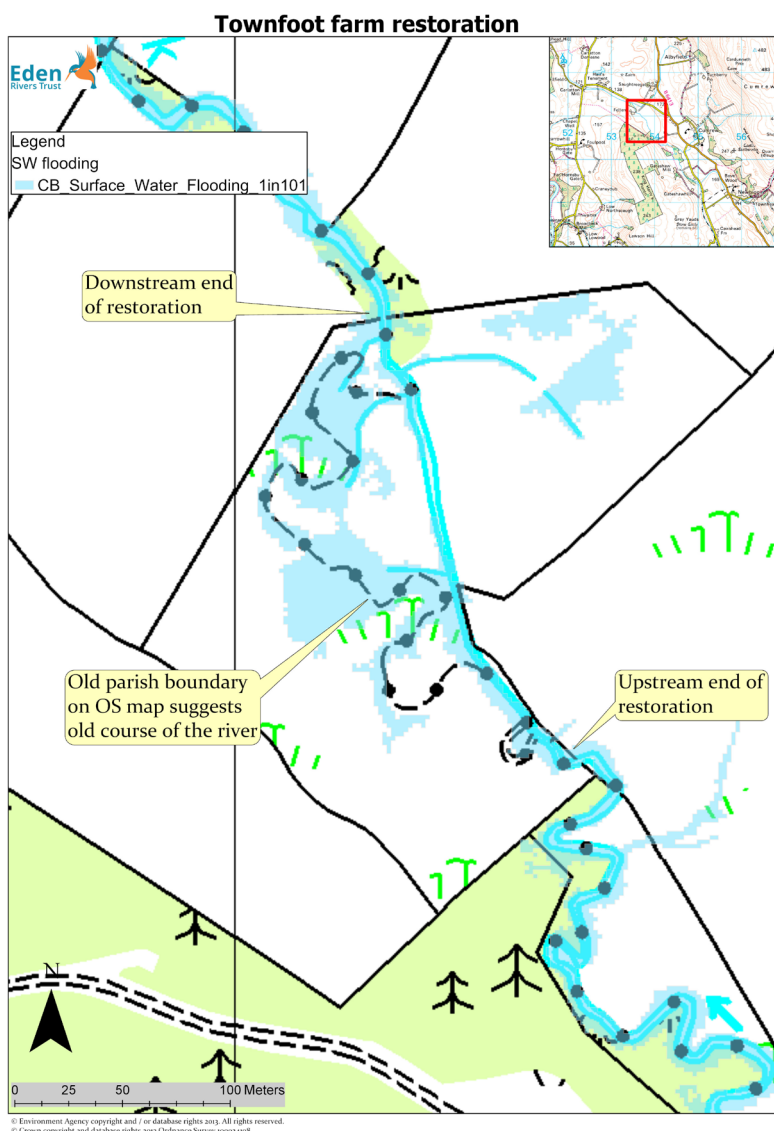
They found a 230m stretch of highly straightened and canalised river between areas of naturally meandering sections of river with woodland cover and in-stream woody debris.

Further research of OS maps showed the old parish boundary in the area as a curving / wiggly line (see map below) - a good indication of where the river used to be.

Feasibility, designs and construction

Feasibility and designs were completed in August 2020 by AquaUoS (now Dynamic Rivers), through the Cairn Beck Defra project. In August 2021, with support from the North Pennines AONB Partnership, Eden Rivers Trust received funding through the Farming in Protected Landscapes programme for the capital works.

Local contractors, I.J. and G Prudham carried out the works which were completed at the end of September 2021.

Townfoot farm restoration

Legend
SW flooding
CB_Surface_Water_Flooding_1in101

Downstream end of restoration

Old parish boundary on OS map suggests old course of the river

Upstream end of restoration

0 25 50 100 Meters

The plan

- Restore the river to where it was pre-modification,

- Create multiple riffles, pools, side channel bars and mid-channel islands,

- Create channels that will naturally laterally move over time,

- Infill approx. 60% of the old channel to leave backwaters to connect to the new channels to create vital refuge for fish,

- Fence off area and add a gate to allow light grazing,

- Plant 125 trees.

Project outcomes

Natural flood management

- Newly created meanders will slow the flow of water travelling downstream and enable a higher volume of water to be stored in the channel which has been increased in length by **165m**.

- The river will be more connected to its floodplain and therefore will enable more water to be held in the floodplain wetland environment.

- Tree planting will roughen the land surface which will slow down surface water flow and intercept rainfall.

- In-channel macrophytes will grow and roughen the in-channel surface slowing the velocity.

- This a priority area to carry out flood mitigation work as this catchment contributes to flooding in Warwick Bridge which is a Community at Risk of flooding.

Biodiversity

- New in-channel features include bars, riffles and pools that will create wildlife habitat, refuge and fish spawning areas.

- More habitat for riparian wildlife will be created through the re-connection of the river to the floodplain providing ideal conditions for farmland wading birds such as lapwing.
  Tree planting will also provide shelter for in channel species as well as bird and bat habitat.

- This project connects the two areas upstream and downstream of this project that exhibit naturally meandering rivers and woodland areas.

- ERT has recently finished an NFM project in the Cairn Beck catchment creating a 5km connected reach of NFM and habitat improvements along the river.
  This site is at the most upper end of this reach and will therefore add great benefit to the immediate area and upstream

- Total hydraulic habitat area has been increased from **13,982m^2 to 29,304m^2**.

Main drone photo:

This is the new channel and riffles just before the channel was

connected.

Note the original straightened channel along the tree line.

Project costs

Feasibility and design	£ 11,941.84
Planning permission	£ 2,056.00
Groundworks for restoration	£ 52,560.00
Bridge design and construction	£ 26,280.00
Geomorphologist site supervision	£ 1,500.00
Fish rescue	£ 3,214.80
Fencing	£ 2,786.00
Tree planting	£ 864.00
PM and mileage	£ 8,239.50
Total:	**£ 109,442.14**

... during high flow in October 2021

Project partners, funders and thanks

Designers:
Dynamic Rivers: Dr George Heritage, Dr Seb Bentley, Dr Neil Entwistle

Contractors:
IJ & G Prudham: Graham Prudham, Richard Ridley

Landowner: David Robley

Funders: Farming in Protected Landscapes programme (with support from the North Pennines AONB Partnership), Environment Agency, ERT

Planning: Carlisle City Council

Consents: Cumbria County Council

Eden Rivers Trust:
Jenny Garbe (Project Manager), Michael Rogers

Find out more about our Cairn Beck projects at edenriverstrust.org.uk

Environment Agency

NORTH PENNINES
Area of Outstanding Natural Beauty

United Nations Educational, Scientific and Cultural Organization • North Pennines UNESCO Global Geopark

Department for Environment Food & Rural Affairs

Eden Rivers Trust