WEST CUMBRIA RIVERS TRUST NATURAL FLOOD MANAGEMENT (NFM) CASE STUDY:

CHARLESGROUND LEAKY BARRIERS AND BUND

ABOUT THE PROJECT

This project was carried out by West Cumbria Rivers Trust and involved the installation of six leaky dams to slow the flow of water within the river channel. On a tributary stream a large leaky dam was installed and connected to an earth bund situated within the field on either side of the watercourse. The dam will push high flows out of the channel where it will be held within the bunded area. As part of the project, fencing was built along the river and the new riparian buffer strips were planted with native trees to provide habitat slow runoff from fields. In total 0.3 Ha of riparian woodland was created, with volunteers helping to plant the trees.

The project was funded by DEFRA as part of their NFM programme and the overall cost of the project was £12,670, including the fencing and tree planting. Each leaky dam cost £350 and the cost of the leaky dam and bund was £2,305. The landowner contributed £1,020 towards the cost of the project, plus all the larch that was used in construction.

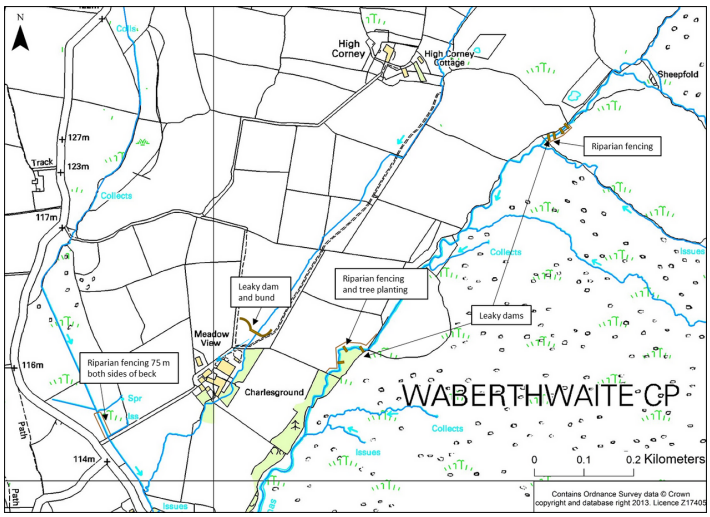

Image: West Cumbria Rivers Trust. Map of project area

Images: West Cumbria Rivers Trust. Images of project area and leaky dams.

DESIGN AND CONSTRUCTION METHODS

In order for the project to go ahead, the following permissions were required:

- Ordinary watercourse consent
- World Heritage Site Heritage impact assessment.

The small watercourse flowing through the centre of the holding overtops in flood events and the water runs down the track and into farm buildings. Therefore, the bund was designed to hold water within the field to benefit the landowner, with the leaky dam causing more water to spill out of the channel reducing downstream flood risk.

Larch was felled from a plantation next to the river and used in the construction of all the leaky dams. The bund was created from earth available on site. Logs were pinned together using metal bars and dug into the bank/bund. For the leaky dams on the main river, logs were also secured behind tree stumps on the bank.

Images: West Cumbria Rivers Trust. Images of leaky dams.

EFFECTIVENESS

The effectiveness of the leaky dams and bund has been measured. A GPS topographical survey was carried out to measure the volume of water stored and it was found that 300m3 of water was stored upstream of the bund. Estimations from simple measurements found that each leaky dam stored 15-20m3 of water.

Since the installation of the bund and leaky dams, there has not been any very high magnitude weather events so the features have only been partially filled.

A time lapse camera shows water backing up behind leaky dams in high flow events. A time lapse video of a leaky dam filling and draining can be viewed at: https://vimeo.com/539837036.

MULTIPLE BENEFITS

The project will provide a number of benefits:

- The 0.3Ha of riparian woodland and the corridors of trees along the bund will intercept and further reduce runoff.
- The trees will also reduce siltation into the river and sequester carbon.
- Habitat creation – there will also be increased in-stream habitat diversity due to the leaky dams.
- The riparian fencing prevents cattle from entering the watercourse which helps improve water quality and the health of the livestock.
- Improved water quality – through reduced siltation.

Image: West Cumbria Rivers Trust. Image of leaky dam