

# WEST CUMBRIA RIVERS TRUST NATURAL FLOOD MANAGEMENT (NFM) CASE STUDY: HEDGE RESTORATION AND LEAKY DAMS AT MOOR FARM, KESWICK

## ABOUT THE PROJECT

This project was carried out by West Cumbria Rivers Trust as part of their DEFRA funded Glenderamackin Natural Flood Management (NFM) project, in partnership with the Environment Agency, National Trust and farm tenant. It involved the restoration of 532m hedge and 31 leaky dams across selected drainage ditches. Hedge restoration involved double fencing at a min. 2.4m wide and to incorporate a drainage ditch or watercourse where relevant. One great example involved this drainage ditch which overflows down onto the main A591 when the road culvert is overwhelmed with water (see Photo 1). Ten leaky dams were placed in the ditch above this culvert to take the pressure off the culvert. The additional buffer strip and hedge will also help to slow the flow by increasing hydraulic roughness.



Photo 1 -Leaky dams in 2m wide ditch above main A591, flowing into Keswick.

Image: West Cumbria Rivers Trust

The overall cost for the whole project was £19,000. The Water Environment Grant funded £14,000 and £5,000 was funded from the DEFRA NFM programme.

## DESIGN AND CONSTRUCTION METHODS

The following permission was required for the project:

- Cumbria County Council Ordinary Watercourse Consent.

The aim of the project was to identify opportunities to restore hedges and slow the flow in the network of farm drainage ditches above Keswick. These ditches were recognised as areas of concern regarding surface flow down to the community at risk downstream. Construction of the leaky dams is intended to slow the flow alongside hedge restoration and encourage the establishment of long vegetation.

The dams have been constructed to be very leaky and made using locally sourced larch, which were knocked in using larch posts for longevity and to give a more natural look. The vegetation in the ditches is now long so that the dams are less visible from the roads.



Photo 2 - Leaky dams and hedge restoration in ditch flowing directly down into Keswick.  
Image: West Cumbria Rivers Trust



Photo 3 - Another photo of restored hedge and leaky dams above Keswick.  
Image: West Cumbria Rivers Trust

## EFFECTIVENESS

The monitoring of the project is ongoing but will be carried out using time lapse cameras and anecdotal evidence. With further funding, water level loggers could be installed. The volume of water stored is 140m<sup>3</sup>.

## MULTIPLE BENEFITS

The project had multiple benefits:

- Hedge restoration provides wildlife corridors, buffer strips to prevent runoff and reduce diffuse pollution, provide shelter for livestock in all weathers and increased tree cover across the catchment.
- An extra kested hedge was created across a known surface flow pathway which has not only helped slow the flow and provide habitat, but also created a safe area for the farmer to sort his sheep. Previously, the farmer has had to cross a busy main road with his livestock to get to the main farm buildings.
- Leaky dams provide temporary water storage and collection of silt which can be re-spread on the land and reduce localised runoff.