# NATURAL FLOOD MANAGEMENT

**Natural flood management (NFM) involves using various techniques to restore or mimic natural functions of rivers, floodplains and the wider catchment. It aims to store water in the catchment and slow the rate at which water runs off the landscape into rivers, to help reduce flood risk to communities downstream. NFM can also be known as working with natural processes, slow the flow, sustainable land management or upstream management.**

## TREE PLANTING

Tree planting and management of woodland areas can take place at a range of scales throughout the catchment from the river's source to floodplains. It aims to improve infiltration and reduce surface water runoff by intercepting rainfall before it reaches the ground and enters watercourses. Tree planting is a long-term upstream management solution, yet offers some short term benefits such as reduction in soil erosion.

### Hedgerows

These act as an extra weather barrier to intercept rainfall and slow water runoff from the land. They can be planted across slopes and between farmland, and also help to provide shelter to livestock and habitats for birds and insects.

### Woodland creation

Woodland is great for intercepting rainfall which increases evaporation of water from the leaves. Less water reaches the ground which reduces the volume entering watercourses. Trees also help stabilise soils, increase infiltration, and provide habitats. Willow coppice plantations are effective at slowing surface runoff so can be utilised to reduce flood risk whilst being an energy crop that provides income to landowners.

### Riparian planting and buffer strips

Buffer strips are usually made of long grasses and shrubs, increasing roughness and providing a physical barrier to slow the flow of water into a watercourse. They can be created next to watercourses which helps increase infiltration and stabilise banks, therefore helps to reduce sediment runoff and soil erosion.

### Catchment planting

Deep rooting systems can be planted in waterlogged soils suffering from compaction to maximise soil stability and infiltration. Tree spacing, density and species affect their ability to store and evaporate water and reduce flood flows. Planting further up in the catchment reduces the amount of water reaching watercourses.

### Benefits

- Reduces the volume of rainfall that reaches the ground, potentially reducing flood risk.
- Increases the amount of carbon absorbed by trees, helping to reduce carbon emissions.
- Provides wildlife habitats and livestock shelter.
- Stabilises soils and prevents soil rosion.
- Commercial woodland can generate income.

### CASE STUDY: Tebay Common Tree Planting

The Woodland Trust worked with Natural England, the Rivers Trust, Tebay Common Grazing Association and landowners to........

#### Issues

- River Derwent catchment is typically a very wet area with low woodland cover and compact upland soils resulting in high levels of runoff.
- Major flood event in 2009 affecting Keswick, Workington, 885 properties in Cockermouth, and destroying six bridges.

#### Solutions

Personal advisory service with landowners to
- understand their needs and explain the benefits of trees and woodland on their land.
- 2,000 trees planted along the river bank and across the land at Stainburn Hall Farm to stabilise banks and slow the flow of flood water.
- 400 trees planted at Paplava Farm.
- Three hectares of trees planted at Derwent Ings.



#### Benefits

- Aims to slow future flood water and give valuable extra time for local communities to prepare for flooding.

Stabilise river banks and reduce the amount of
- water reaching the ground and watercourses.
- Enhanced biodiversity and reduced diffuse pollution.