

Upstream Management

Upstream management, otherwise known as slow the flow, is a collective term for techniques used to manage flood risk and includes flood storage solutions as well as natural flood management (NFM). Upstream management is the alteration, restoration or use of landscape features to manage flood risk. One technique is woodland creation.

Woodland Creation

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

Floodplain Woodland

Woodland can be placed carefully across the floodplain to help avoid synchronising flood peaks, which is thought to offer the greatest potential for downstream flood mitigation. Most commonly, conifer and short rotation woodland is used with the added benefit of providing a wood fuel resource.

Catchment woodland

A deep rooting system can be planted in water logged soils that suffer from compaction to maximise soil stability and infiltration. Tree spacing, density, species and structure also affect the ability to reduce flood flows through their effect on evaporation, soil water storage and surface roughness. Planting further up in the catchment reduces the amount of water reaching watercourses.

Riparian Woodland

This can be planted as buffer zones to provide the maximum amount of contact between tree and water, and is most commonly made up of broadleaf species. This will increase infiltration, evaporation and surface roughness. Care should be taken to ensure riparian woodland is not planted in areas where debris could block pinch points, such as at bridges and culverts.

Benefits

- Reduces the amount of rainfall that reaches the ground, potentially reducing flood risk.
- Increases the amount of carbon absorbed by trees, helping to reduce carbon emissions.
- Provides shelter and shade for livestock and prevents soil erosion.
- Provides important wildlife habitats and supplies them with shade and shelter.

Case Study: River Derwent Catchment

The Woodland Trust worked with other groups and landowners in the River Derwent catchment in this project, helping them plant trees on their land to reduce the likelihood and impact of floods in the future.

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.

