



# Case Study: Wnion Catchment Natural Flood Management

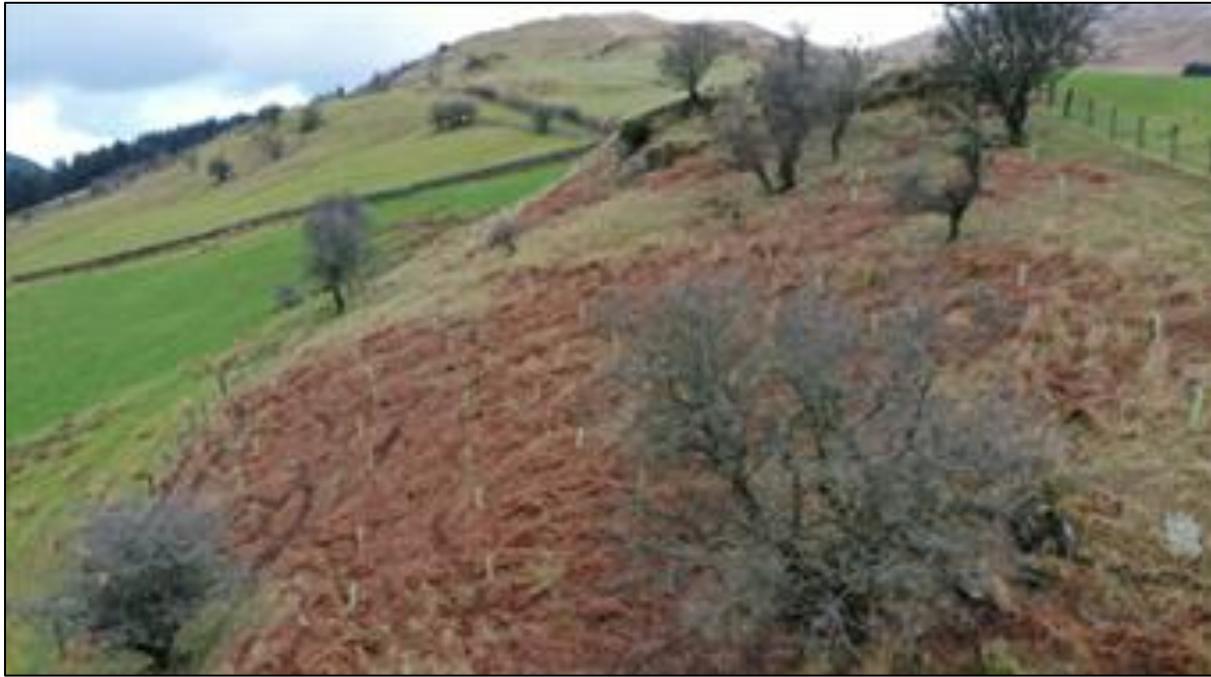


Figure 1 Cross-slope woodland planted as part of the project

<b>Project Location</b>	Rhydymain, Gwynedd
<b>Lead Delivery Organisation</b>	Gwynedd Council (YGC)
<b>Key Partners</b>	Snowdonia National Park Authority (SNPA)
<b>Main funding stream(s) for project delivery</b>	Welsh Government Flood and Coastal Erosion Risk Management grant

## 1. NFM Measures Implemented

Implemented measures include:

- A total of 7km of hedges
- Over 48,000 trees being planted
- 1.8ha of new woodland
- 4ha of woodland protected with new fencing
- 11 new ponds
- 3.5km of blocked drainage ditches

Carefully selected planting sites can alleviate flooding through increased infiltration rates, water usage and near surface storage capacity, as well as disrupting soil loss through erosion.

New ponds were designed to increase water attenuation thereby reducing or delaying peak flows during periods of heavy rainfall. The ponds were created on tributaries to the Afon Wnion. When at maximum capacity the ponds combined will store about 6.9 million litres of water. Sediment traps and boulders were placed also to reduce erosion and slow water flow.

Drainage ditch blocking has multiple benefits, including water retention, carbon storage and future sequestration and improvements to biodiversity.

## 2. Key drivers for the project

### 2.1. Flood Risk Management

The lower part of the catchment near Dolgellau has a long history of flooding problems associated with the level of the Afon Wnion as it passes the town. More local to the area of intervention, higher up the catchment, surface water run-off and land drainage problems have affected agricultural practices.

Extensive creation of drains on upland moors in the past has reduced the uplands capacity to store water.

### 2.2. Wider Environmental Enhancements

Variety of new habitat creation.

### 2.3. Societal Benefits

As mentioned above, NFM measures reduced surface water problems to numerous landowners within the study area.

## 3. Project Description

The project has been set up collaboratively to make best use of expertise. SNPA's role in the project was farmer liaison due to close relationship with the industry, woodlands and hedges expertise and ecological advice. YGC's role was its expertise in direct flood management measures such as in-channel works and pond creation. YGC have specialist permitted development powers that allow simpler delivery of in river works.



Key to the project was the links between SNPA and a group of agricultural landowners within the Wnion catchment, all NFM measures were completed on the groups land. The 11 farms ranged from the valley bottom to mountain summits +850m in elevation, and ranged in size with some over 400ha whilst others were less than 10ha: with a combined total of around 2,500 hectares of land.

#### 4. Key Project Outcomes

##### 4.1. Successes

This trial project has demonstrated that collaborative working between public organisations and the agricultural sector can create real life benefits for the environment and people living downstream. Also the project has illustrated the eagerness of landowners to assist with NFM measures.

##### 4.2. Lessons Learnt

The initial works are too small scale to have a real catchment effect, but they provide the foundations for future larger projects with more landowners.

##### 4.3. Monitoring and Maintenance

None identified beyond photographic records over time and landowners observations. No baseline flow/stage information available for surrounding watercourses.

#### 5. Project Photographs



Figure 2 Flood storage pond implemented as part of the scheme



Figure 3 Drainage ditches which have been blocked as part of the scheme.



Figure 4 New fencing implemented to protect hedgerow planting.



Figure 5 Aerial image of the implemented ponds on flow pathways.



Figure 6 New pond implemented, with nature refuge island.