CASE STUDY: WYRE RIVERS TRUST

BACKGROUND

Throughout the 1800's, large swathes of additional farmland were needed to supply the growing population. This resulted in the draining of wetter areas including moorland and peatlands, to create new fields. Drainage channels are excellent at removing water from a site quickly, emptying it into the river and allowing the land to remain solid enough for crops or livestock. Unfortunately, this means that during heavy or prolonged rainfall, rivers can rapidly reach capacity and flooding can occur. Furthermore, throughout the 20th and 21st century as the impacts of climate change have increased, we have seen an increase in the incidence and volume of rainfall, and a reduction in vegetation cover through deforestation and hedgerow removal (vegetation intercepts rainfall slowing its journey to the river, and also softens the ground increasing absorption) putting further pressure on our river systems.

WHAT WE'RE DOING AND WHY

The Wyre Rivers Trust is working with local landowners and farmers in the Forest of Bowland to mitigate flood risk downstream by working with natural flood management techniques. In essence, this means looking at how the natural world interacts with the weather and applying this information to local flood management scenarios. One of the methods the Trust uses is installing leaky dams, constructed from either wooden boards or from tightly woven bundles of brash and staked into the watercourse. These act in the same way as beaver dams would in a natural ecosystem. The leaky dams are by design not watertight, allowing the normal passage of water through at all times but slowing enough down during peak flow to cause water to back up behind the dams. Once backed-up, the water is released slowly through the leaky areas of the dam. This

Image: Wyre Rivers Trust

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allows the watercourse to flow freely and aquatic wildlife to travel up and down the river, but still provides flood mitigation benefits. This slow release is critical; without leaky dams, all the water enters the main river rapidly and this can cause it to burst its banks and flood. With leaky dams installed, the water takes longer to enter the river so time is given for existing water to exit before new water arrives. This means the river still receives the same volume of water but spread over a longer period of time, therefore reducing the depth at any one time.

Since July 2019, the trust has installed over 70 leaky dams across a number of sites. Crucially, all the sites drain into the same catchment of a single beck, allowing monitoring of the impacts. During the winter storms of early 2020, we monitored the water levels and calculated the impact we were having on site Over a 600m stretch of watercourse containing eight leaky dams, we calculated that water levels had decreased by 9cm, showing that water was being stored behind the leaky dams. Detailed calculations of water storage are on hold due to Covid-19, however initial estimates suggest between 10 and 15m3 of water were stored on this small section of watercourse, preventing them from contributing to flooding downstream. Amplify this up to larger catchments and the potential impact is huge. Further benefits include increased biodiversity due to the increased diversity of watercourse habitats, in turn providing significant positive impacts on the biodiversity of the wider area, as well as for water and air quality, capturing runoff and carbon storage.

In addition to installing leaky dams, the Trust has also installed over a kilometre of stock-proof fencing in the catchment, enclosing approximately 10,500m2 of land. The fencing has been installed along watercourses to prevent poaching by livestock and to allow vegetation on the banks to regenerate. Livestock have a great impact on watercourses; they erode banks causing sediments to enter the flow (which further downstream get deposited and can contribute to flooding) and they compact the earth so less rain is able to be absorbed and instead runs off into the river. Vegetation along banks is vital for stabilising the soils in periods of heavy rain and against the flow of the river. Vegetation also physically slows the flow when it drapes in the water, captures sediments and debris, filters pollutants improving water quality and shades the water improving the habitat for aquatic life. Bankside vegetation is also valuable for wildlife. Livestock also defecate in the water and any medicine and treatments on the animals can wash off and cause unintended impacts on aquatic life.

Image: Wyre Rivers Trust

The fencing was installed in November 2019 and by January 2020 there was already a noticeable difference between the sward height of grass in the field and grass behind the fence. Covid-19 has so far prevented further monitoring of the impacts throughout spring but expectations are that bare patches of earth will be partially or fully recolonised and vegetation will have drastically increased in height. Over time, the diversity of vegetation is also expected to increase and the additional vegetation will allow the leaky dams to self-maintain as the dams will capture any loose vegetation and build themselves up again. Over time, seeds will germinate in the dams and further help to maintain them.

FUTURE WORK

Future plans for the trust involve working with additional farmers to complete the natural flood management planned for the catchment of this beck. As well as further leaky dams and fencing, there are initiatives to create wetlands and flood-water storage areas, plant woodland and increase hedgerow coverage, as well as other land-management practices such as wildflower meadows, all of which will have positive impacts for flood mitigation, water and air quality, biodiversity and climate change. Once the opportunities on this beck have been exhausted, we will be able to use it as a role model for future work.

GET INVOLVED!

Very little of the Trust's work can be done without our fantastic volunteers, the cooperation and support of local landowner and tenants, and our corporate partners. If you would like to get involved with our work as a volunteer, please visit https://wyreriverstrust.org/ .

Image: Wyre Rivers Trust