

Sussex Flow Initiative case study: Natural Flood Management at Kiln Wood, Blackboys

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Project summary

Woodlands can be ideal places to utilise natural woody material for Natural Flood Management (NFM). In this project a variety of woody material was strategically placed and secured in small headwater streams running through Kiln Wood and Turnmill Wood, Blackboys (East Sussex). These leaky dams slow and store water in the channel and in small floodplain areas during



Figure 1. Leaky dam constructed to allow low flows to flow unimpeded, but to intercept, slow and divert flood waters

high flows, leaving low flows to pass unimpeded. We've been regularly checking the effectiveness and safety of all features, and they are successfully holding back water during and after heavy rainfall. Sussex Flow Initiative is working with the Woodland Trust and other land owners to identify other sites which are suitable for this type of NFM.

Site & catchment characteristics

National Grid Reference	TQ 52570 20133
Catchment, catchment size (fluvial extent)	River Ouse, 510 km ² (River Uck sub catchment)
Land use	Broadleaved woodland (incl. ancient woodland)
Annual rainfall (Met Office Standard Average Annual Rainfall 1961-1990)	823mm

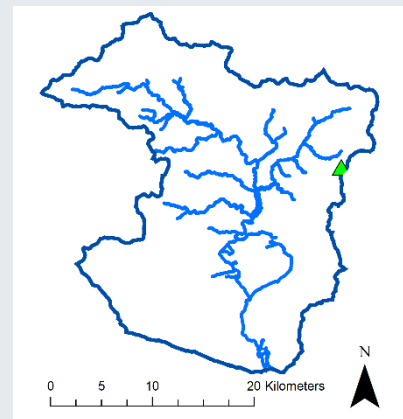


Figure 2. Kiln Wood in the Ouse catchment

Background information

Kiln Wood is a small woodland to the south of Blackboys (East Sussex) on the southern edge of the High Weald AONB. It consists of broadleaved woodland with areas of ancient woodland (>400 years old), dominated by large oaks, with an understory of old coppice and natural regeneration of sweet chesnut, sycamore, birch and holly. Turnmill Wood, adjacent to Kiln Wood, is a recently planted native broadleaved woodland. Two small streams and a series of ditches run through the two woodlands, with large sections that have been dug out and/or straightened. The only infrastructure in close proximity to the woodland is a small road bridge at the downstream end of the site, and three small wooden footbridges which link footpaths through the site.

Project work

Following consultation with the Woodland Trust, a walkover of the site, allowed the opportunities for NFM to be identified and mapped. Woody material was identified as the most appropriate NFM technique to utilise, given the small size of the streams and the abundance of onsite woody material. A variety of different types of woody structures were used to slow and store water, and push water out of the channel and onto small floodplain areas where the increased roughness will further reduce water velocity. Areas of stream immediately downstream of bridges or alongside footpaths/rides were avoided so that there was no risk of backing up flood water onto public footpaths.

In total 30 structures have been installed so far, using a variety of techniques including banktop diverters, in-channel deflectors, woody dams, brash barriers and gully stuffing. The longevity and efficacy of these structures will be monitored to ensure they are influencing the flow of water in the intended way, and remain secure.

Kiln Wood and Turnmill Wood will be used as a demonstration site, to train people in NFM techniques and to educate and inform landowners and other stakeholders on what practical implementation of NFM can look like.



Figure 3. Leaky dam (top) and brash bundles intercepting overland flow pathway (bottom)

Consent

The structures were installed on ordinary watercourses and ditches within Woodland Trust land, and therefore did not require consent from the Environment Agency, however East Sussex County Council were consulted.



Figure 4. Map of Kiln Wood and Turnmill Wood showing locations of woody structures

Multiple benefits

Natural flood management provides a huge range of additional ‘natural capital’ benefits to people and wildlife. In addition to storing and slowing water for flood reduction, woody material, or “leaky barriers” provide important habitat for a range of aquatic species. They also help improve water quality by encouraging sediment and pollutants to settle out, and they help streams to naturalise and generate more heterogeneous habitat. Natural wood in streams also helps to regulate local and regional climates by storing carbon and cooling stream water. We estimate that our natural woody structures will be slowing and storing around 30,000 litres of water¹ per flood event, as well as large amounts of sediment.

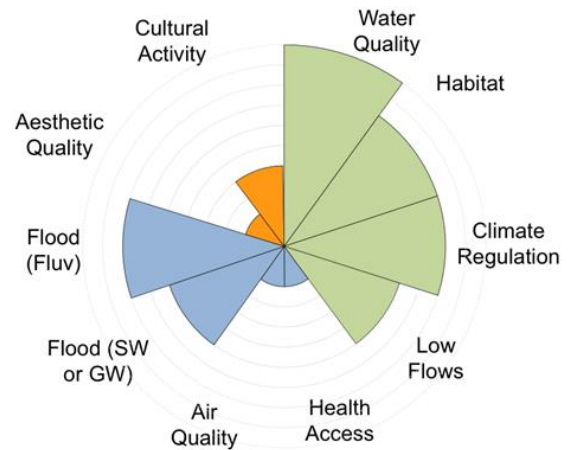


Figure 5. Types of benefits provided by ‘leaky barriers’²

Collaboration & funding

This project relied on a strong relationship with the landowner, and was the result of SFI working closely with partners including Sussex Wildlife Trust, the Woodland Trust, and the Environment Agency.



Sussex
Wildlife Trust



Environment
Agency

Project funding	Funding for the work was provided by a grant from the Banister trust, as well as from the Sussex Flow Initiative for staff time and in-kind contributions in the form of volunteer time.
Overall cost and cost breakdown	<p>The total cost of the project was £2616</p> <p>Materials (brush bundles and chestnut stakes): £86 + £35</p> <p>Tools: £200</p> <p>Project Officer & Project Manager: £805 + £1,040</p> <p>In kind and volunteer hours: £450 (including 14 hours of volunteer time)</p>

Future work

The Sussex Flow Initiative will continue to work closely with the Woodland Trust, to identify other opportunities for NFM work in woodlands, and to liaise with rangers to ensure that the work aligns with the management plans for each site.

If you own a local woodland and would like to learn more about using natural woody material, please contact us.



¹ Based on each structure storing 1,000 L of water per flood event

² Environment Agency (2017) Working with Natural Processes: One page summaries [accessed here: <http://bit.ly/2nTyDg8>]

For more information please contact sussexflowinitiative@gmail.com or visit our website [here](#)