

CASE STUDY

Snows Farm Nature Reserve

Snows Farm Nature Reserve, in the upper Slad Valley, is designated for its steep species-diverse grasslands. The Dillay Brook flows through the length of the reserve within a woodland corridor approximately 25m wide.

Location: Snows Farm Nature Reserve

Water course: Dillay Brook

Sub-catchment: Slad Valley, Stroud Frome

Ownership

The Gloucestershire Wildlife Trust (Local Nature Reserve).

Access

The nature reserve can be accessed by public footpaths and permissive footpaths. The works described here can be seen from footpaths.



About the project

The aim of the project was to slow down the flow of flood peaks into the valley and divert water onto small floodplains. Fifteen leaky dams constructed from tree trunks and branches were installed to create a partial blockage of the stream. In low flows, water can pass freely under the structures but, at high flows after very heavy rain, some water will be attenuated behind the leaky dam.



How it was achieved

The stream-side woodland is mostly alder, ash and hazel coppice. This has been unmanaged for approximately 30 years so a considerable amount of coppicing and clearing was required before workers could fell the larger trees that were needed for the leaky dams. The banks are too steep for machine access so all of the work was carried out by a two-man felling team. Felled trees were manipulated into place using a Tirfor winch. All of the tree trunks were then pinned in place using 1.2m reinforcing steel bars, through holes drilled with a petrol auger, to clamp the material together and secure the structures into the ground. The timber was donated to the project by the landowner.

The second technique used was to fill the spring flow gullies with small branches, or brash, from the tops of the trees that had been used for the larger structures. The brash traps silt and sediment, reducing the amount reaching the stream.

The third intervention was the installation of three spring-fed and one solar pump-powered livestock drinking troughs. This enabled the stream banks to be fenced to keep livestock from entering the stream and causing damage to the banks.

Construction was carried out by Gloucestershire Wildlife Trust staff using a small number of skilled volunteers.

Consents

The works described above required two main types of consent:

Land drainage consent - a consent under Section 23 of the Land Drainage Act 1991 permitting works that may impede the flow of a water course. Issued by Stroud District Council under powers devolved from Gloucestershire County Council.

Felling licence - a consent issued by the Forestry Commission under the Forestry Act 1967 permitting the felling of trees for any purpose that falls outside the exemptions listed by the act.

Why this work was needed

The work on Snows Farm NR was designed to do two things:

- to help reduce flood risk
- to improve the in-stream habitat and banks for wildlife

Benefits

Large woody debris (LWD) has several benefits. Firstly, and crucially, the structures reduce high flows, slowing the rate at which flood peaks travel downstream. Secondly, LWD will, over time, speed up the flows that are immediately downstream of each structure, cleaning gravels and stones of silts. Silt and sediment will eventually accumulate behind the structures, creating a small head of water and long-term changes to stream structure. Large woody debris can divert water during higher flows and allow it to collect on the floodplain. This allows silt and sediment to drop out of the water column onto the floodplain, decreasing the total sediment load in the stream.

Woody debris also provides a natural habitat for many invertebrates, lower plants and fungi. It engineers habitat diversity, creating a system of pools and riffles which will attract a range of invertebrates and fish.

The spring flow gullies are significant sources of silt and sediment so filling them with loose brush will intercept some of this flow and reduce the transport of silt into the main brook.

Cattle and sheep have previously had access to the stream and caused bankside erosion. This has caused silt and soil pollution in the stream which has an impact on wildlife and can increase flood risk downstream. Fencing keeps livestock out of the brook and the installed troughs provide them with an alternative source of drinking water.

Construction data

- **15** LWD leaky dams
- **4** spring lines filled with brush
- **3** spring-fed and 1 solar pump-powered trough and 1 drinking bay

Costs

- **21** FTE days and **23** volunteer days at a total cost of approximately **£6,500**
- Number of interventions: **24**
- Estimated cost per intervention: **£270**

1. Why has the wildlife trust allowed this work on your nature reserve?

"Natural flood management blends well with our nature conservation aspirations for the site. Woody debris falling into the stream would happen naturally; it helps feed the food chain and allows light in for the growth of aquatic and marginal vegetation.

We have a large membership presence in the Stroud Valleys and see NFM as a way of helping our members and other households downstream."

2. What impact has it had on the reserve?

"The holding back of water on our holding has had little impact on our day-to-day management of the site. During normal flows, water runs through the structure with no impoundment. Even when the water is held back during flood events, it soon drops back to normal levels."

Richard Spyvee

Gloucestershire Wildlife Trust



**STROUD RURAL
SUSTAINABLE
DRAINAGE PROJECT**

NATURAL FLOOD MANAGEMENT
IN THE STROUD VALLEYS

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