

Chalk Streams of Lincolnshire

Case study: The Waithe Beck demonstration project

In 2004 the Lincolnshire Chalk Streams Project, in partnership with Sir Richard Sutton's Settled Estates, implemented a restoration project on the Waithe Beck at Stainton-le-Vale in the heart of the Wolds. The site comprised a section of heavily shaded, straightened, steep-sided channel with a uniform bed bounded by woodland to the south and arable land to the north. These conditions resulted in limited biodiversity.

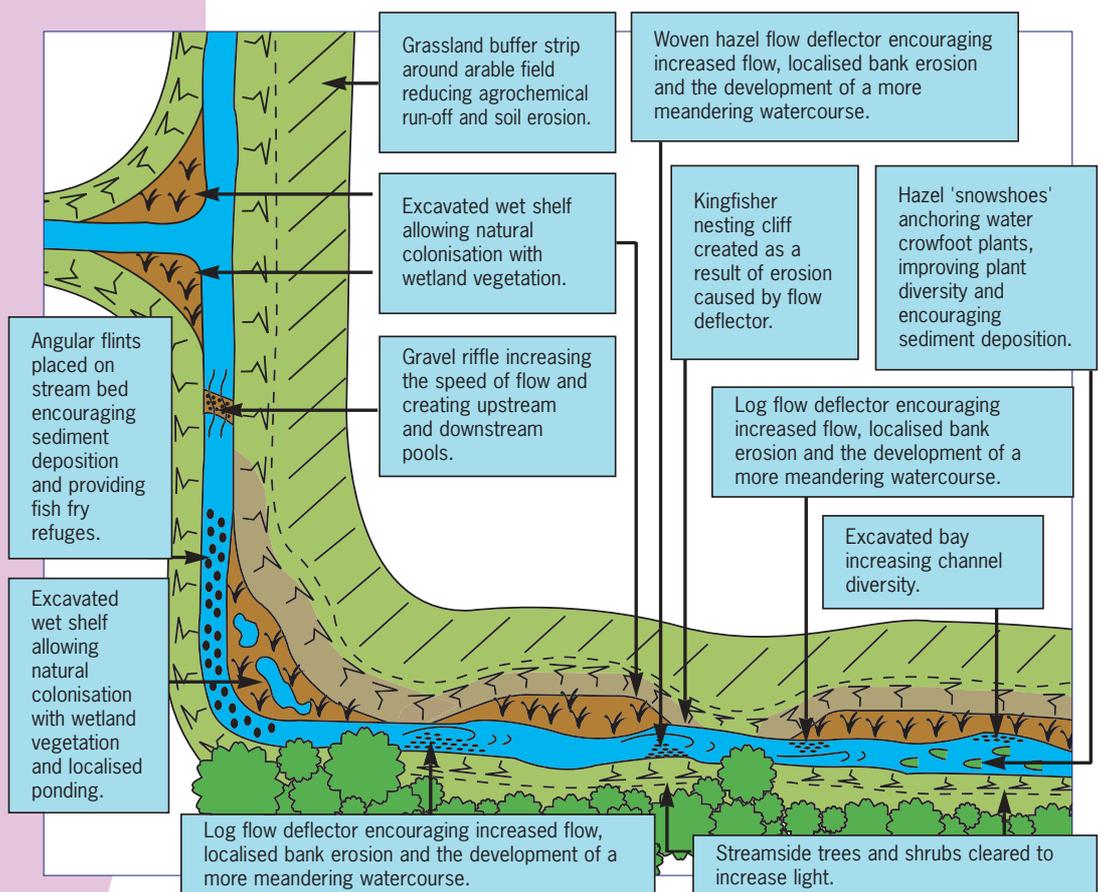
The objective of the project was to increase the structural and biological diversity of the stream and to demonstrate a range of restoration techniques.

PROJECT PLANNING AND CONSULTATION



The Waithe Beck (Autumn 2003).

Initially an outline restoration scheme was developed by the Environment Agency. Proposals included the removal of selected streamside trees, excavation of a series of low wet shelves, the installation of a variety of flow deflectors and provision of in-stream cover features.



Outline restoration scheme

To ensure that the project did not have an adverse impact on existing environmental resources and complied with various legal requirements, the following organisations were consulted on the outline proposals:

- Environment Agency (biological information, requirements for water-related consents);
- Lincolnshire Wildlife Trust (biological information);
- Lincolnshire County Council (archaeological information, planning requirements);
- Forestry Commission (Felling Licence);
- East Lindsey District Council (Tree Preservation Order);
- Public utility companies (locations of underground services).

The requests for environmental information revealed the presence of local archaeological finds so an archaeological survey was commissioned and, as there was a lack of current ecological data, additional survey work was also undertaken. The ecological surveys also provided baseline data against which the success of the project could be measured in the future.

Following the consultation and additional survey work the outline plan was refined and, where necessary, consents were obtained.

SCHEME IMPLEMENTATION

Stage 1. Felling of trees and shrubs (Winter 2003/04)

As the stream lies to the north of an area of woodland it received little direct sunlight. This discouraged the growth of aquatic and marginal plants. The situation was improved by felling selected streamside trees and shrubs. Some of felled timber was retained for use as log flow deflectors later in the project and the remaining brush was chipped. As the stumps were left untreated they will regrow as coppice which will be managed on a 5-7 year rotation to maintain the open areas.

Stage 2. Excavation of low wet shelves (Spring 2004)

The stream was confined to a straight, steep-sided channel so a series of wet shelves (berms) was excavated to increase light, encourage the growth of fringing wetland vegetation and allow a more natural channel to develop following the installation of flow deflectors. Topsoil was stripped prior to excavation and the excavated material was spread thinly on the adjacent field before the topsoil was replaced.

Nutrient-rich topsoil was not placed on the newly excavated berms, as this would have encouraged the growth of a coarse plant community with limited diversity that required more frequent management.





Stage 3. Introduction of water crowfoot using the snowshoe technique (Summer 2004)

Beds of water crowfoot, or *Ranunculus*, are a characteristic feature of chalk streams. Plants were collected from further downstream and secured to the stream bed by snowshoe shaped woven hazel frames to provide cover for fish and invertebrates and create variations in current.

Stage 4. Installation of in-stream structures (Summer 2004)

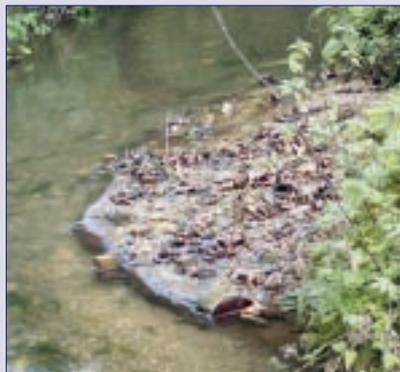
A variety of flow deflectors were installed in the stream to narrow the channel and increase the flow to encourage localised bed and bank erosion and deposition of silt. The aim was to create a more diverse, meandering channel and provide areas for the establishment of marginal wetland plants and habitat for a greater variety of invertebrates.



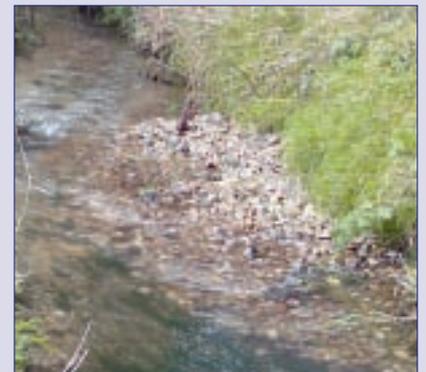
Faggot Deflectors were constructed from bundles of brushwood secured with timber pegs and wire and covered with locally excavated gravels.



Log Deflectors (Type 1), bedded on clay, secured with timber pegs and wire and back-filled with clay or gravel, were constructed from timber felled on site.



Log Deflectors (Type 2), also constructed using locally felled timber and backfilled with gravels and silty clay, were used to alter the flow and create a low wet shelf for colonising wetland plants.



Gravel Bars were created by placing clean imported gravel across part of the streambed.

Stage 5. Provision of in-stream cover (Summer 2004)

The in-stream restoration was completed by the placement of large angular flints on the stream bed to create localised variations in flow, create slack water refuges and provide protection from predators for fish and invertebrates.

For further information and opportunities to improve Lincolnshire Chalk Streams contact:

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Stage 6. Agricultural Restoration (Summer 2004)

The final stage involved the creation of a 10 metre wide grassland buffer strip adjacent to the stream to reduce the effects of soil erosion, nutrient enrichment caused by fertiliser run-off and the impact of other agrochemicals. The land that had been disturbed by the excavation of the berms was sub-soiled to relieve soil compaction prior to reseeding using a Defra approved seed mix.



Completed Waithe Beck Project (Summer 2004)

MONITORING

The survey of freshwater invertebrates undertaken at the project planning stage was repeated in January 2005. The results showed that the planting of water crowfoot and the construction of flow deflectors had enabled species to colonise from downstream and led to the appearance of new species not previously recorded at the site, including a regionally rare stonefly. Overall, the number of invertebrate species recorded rose from 14 to 44, demonstrating that the restoration work had resulted in immediate improvements. Periodic monitoring will continue to determine the long-term effects of the scheme.

VISITING THE WAITHE BECK DEMONSTRATION PROJECT

The Waithe Beck Project was carried out at Hall Farm near Stainton-le-Vale, a LEAF (Linking Environment and Farming) Demonstration Farm where an Integrated Farm Management approach ensures that wildlife is an integral part of a viable farming business. Group visits can be arranged by contacting:

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