

# Chalk Streams of Lincolnshire

## Chalk stream restoration techniques

The decline in the condition of Lincolnshire chalk streams has seen a change from the classic open, meandering stream with fast and slow moving runs, deeper pools, gravel shoals, beds of water crowfoot and a fringe of wetland vegetation, teaming with fish and insects and flowing through pasture or hay meadows to straight, overgrown, steep-sided channels, with no variation in flow and little aquatic life, running through arable land. However, a variety of techniques can be used to increase channel diversity.



### CREATION OF MEANDERS AND MARGINAL WETLANDS

Excavation of a low wet shelf, or berm, at one or both sides of a straightened channel will encourage the growth of a wide strip of wetland vegetation and create the conditions, in combination with flow deflectors installed in the stream, that allow a more meandering stream to develop.



### CREATION OF RIFFLES, POOLS AND BARS

Gravels, ideally of the same type that occur locally, can be placed in the stream to modify and deflect the flow. Strategically placed and shaped, gravels can be used to raise the bed of streams without raising upstream levels and impounding water. These riffles increase the speed of flow and create deeper pools as the water races over the raised bed. Gravel bars can be placed along the sides of streams to direct and deflect the flow, adding to in-stream diversity. Still water at the sides of riffles and bars allows silt to settle, encouraging the growth of marginal vegetation, whilst the faster water cleans the gravel, providing ideal conditions for plants like water crowfoot.

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

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## INSTALLATION OF FLOW DEFLECTORS

Flow deflectors are used to create variations in current. They are simple structures involving the installation of one or more logs at 45° to the bank and projecting either up or downstream for up to half the stream width. Individual logs are bedded on clay or gravel and secured by stakes. Where a series of logs is used the gaps are filled with clay or gravel. The deflectors increase the flow by narrowing the channel, encouraging localised bed and bank erosion and the deposition of silt. The result is increased channel diversity, with areas for the establishment of marginal wetland plants, habitat for a greater variety of invertebrates, a more meandering channel and the creation of cliffs suitable for nesting kingfishers. Faggots, brushwood bundles, can also be used to achieve the same effect.

## CREATION OF IN-STREAM COVER

Simple techniques can be used to increase the number of valuable refuge areas for fish, particularly fry, and invertebrates. The placement of angular cobbles or brushwood, firmly secured to the bed or bank of the stream, creates quiet resting places away from strong currents and offers protection from predators.

## INTRODUCTION OF WATER CROWFOOT

Beds of water crowfoot, or *Ranunculus*, are a characteristic feature of chalk streams, providing cover for fish and invertebrates and creating variations in current which improves stream diversity. Water crowfoot no longer occurs widely in the Wolds, but it can be successfully established through the *Ranunculus* snowshoe technique where plants are secured to the stream bed by snowshoe shaped woven hazel frames. The Environment Agency can advise on sources of native water crowfoot species that are suitable for introduction.

