

Boot Lane Enhancement Project - Gravel riffles (1)

Technique: Gravel riffle creation

Project location: Boot Lane Nature Reserve, Barrington

River: Shep

County: Cambridgeshire

Project start date: March 2005

Project end date: November 2007

Length: Unknown

Cost: £110

Upstream grid reference: TL396493



Stretch of the river Shep lacking clean gravels and spawning habitat

Site background

The River Shep is a chalk stream, much of which is heavily degraded and has suffered from a combination of historical management, especially dredging and hence removal of any gravels and water abstraction. Vegetation cover was particularly extensive on the reach, restricting light from entering the channel and enabling in-channel vegetation to grow. There was also a lack of suitable gravel spawning habitat for the range of fish that the rivers supports, including chubb and roach. Following a site inspection undertaken by the River Restoration Centre, a series of recommendations to enhance the river were made in March 2005.

Objectives

To provide a suitable spawning habitat for chubb and roach. To manage the extensive vegetation cover, allowing light to enter the river channel and enable in-channel vegetation growth to occur.

Design

A topographical survey undertaken by 'the friends of the river Shep' (prior to the work) identified areas in which it was deemed suitable to import gravel. Subsequent work took place in November 2007 with the assistance of the local volunteer group 'the Barrington conservation trust'.

- Gravel, provided free of charge by the local Amstey Quarry, was tipped into the river channel at two locations; downstream of a meander, and immediately upstream of a footbridge.
- Volunteers from the local conservation group manually moved the 10 tonnes of gravel with wheelbarrows, tipping the gravel into the river in a controlled manner. Rather than creating a uniform riffle, a varied and undulating profile was created to create a pool/riffle sequence in the channel. Any existing water crowfoot (*Ranunculus fluitans*) was left in place and allowed to grow through the gravel.
- Vegetation was cut back by the local community group to allow light to enter the channel. Willow spiling bank revetments were installed prior to the gravel works to provide bank protection.



Gravel riffle, providing a spawning habitat for roach and chubb.

Subsequent performance - RRC's views

Since the work took place, fish have been observed spawning on the newly created gravel riffles. In-channel vegetation growth has increased, with starwort (*Callitriche stagnalis*) and water crowfoot (*Ranunculus fluitans*) being observed. This project is an excellent example of what can be achieved by working with the community and with little funding available.



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This site was last visited by RRC staff on 10th June 2008

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Boot Lane Enhancement Project - Meander restoration (2)

Technique: Faggot and brushwood bank protection

Project location: Boot Lane Nature Reserve, Barrington

River: Shep

County: Cambridgeshire

Project start date: March 2005

Project end date: February 2006

Length: 10m

Cost: £20,000 (total project cost)

Upstream grid reference: TL396493



Eroding outside bend of meander as a result of the horse drink.

Site background

The River Shep is a chalk stream, much of which is heavily degraded and has suffered from a combination of historical management, especially dredging and hence removal of any gravels, and water abstraction. The meander bend located downstream of the footbridge has previously been dug out and re-graded by the landowner to form a horse drink (which is no longer in use). Horses have subsequently eroded the banks, and the river has become over-wide and incorrectly aligned. As the river has been trying to find a more 'natural' profile, siltation has occurred on the inside of the bend, and the outside of the meander has subsequently suffered from erosion. Following a site inspection by the River Restoration Centre, a series of recommendations to enhance the river were made in March 2005.

Objectives

To provide a sustainable solution to restore the meander, protecting the outside of the meander from erosion and preventing the bank from becoming unstable in the future.

Design

The restoration work took place in early 2006 with the assistance of the local volunteer group 'the friends of the river Shep'. Amenity Water were contracted to undertake the installation of the design, with the following work taking place:

- Brushwood and faggot bundles were installed on the outside of the meander bend, which were staked and tied to the river bed and bank, encouraging siltation by slowing the flow through the structure and reducing levels of bank erosion.
- Willow and reed canary grass were planted in order to stabilise the bank further.
- Vegetation has been maintained in recent months by hand cutting, in order to maintain the summer low flow channel.



Recovered meander showing increased in-channel and marginal vegetation growth

Subsequent performance - RRC's views

Since the works took place, vegetation has established rapidly on the bank as well as on the berm on the inside of the meander. Whilst vegetation has established well on the berm, consideration may need to be given to further cutting the meander in order to prevent scouring of the berm.



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Boot Lane Enhancement Project - Channel narrowing (3)

Technique: Channel narrowing & habitat ledge creation, bank re-profiling

Project location: Boot Lane Nature Reserve, Barrington

River: Shep

County: Cambridgeshire

Project start date: March 2005

Project end date: August 2006

Length: 100m

Cost: £20,000 (total project cost)

Upstream grid reference: TL391491

Site background

The River Shep is a chalk stream, much of which is heavily degraded and has suffered from a combination of historical management, especially dredging and hence removal of any gravels, and water abstraction. The river at this section was over-wide and too large to support average summer low flows. The reach was also heavily shaded, with very little light able to penetrate the extensive vegetation cover in order for in-channel vegetation growth to occur. Subsequently, there were very few of the features expected to be seen in the context of a chalk stream environment. Following a site inspection by the River Restoration Centre, a series of recommendations to enhance the river were made in March 2005.

Objectives

To improve the habitat quality of the river, by narrowing the channel to a more natural width. To manage the extensive vegetation cover, allowing light to enter the river channel.

Design

Subsequent work took place in early 2006 and was undertaken by Amenity Water, with the subsequent vegetation management undertaken by the local volunteer group 'the friends of the river Shep'.

- On the straight section upstream of the footbridge, 100m of channel was narrowed to 50% of its original width. This was achieved by installing faggot bundles supported by posts driven into the bank, creating a habitat ledge for vegetation growth to occur. The ledge was partly planted with marginal vegetation (reed canary grass and sedge) to bind deposited silt together.
- Cambridge conservation volunteers undertook tree management along the reach to reduce shading and allow light to penetrate through the vegetation.

Subsequent performance - RRC's views

Since the work took place, vegetation has naturally begun colonising the habitat ledges. With increased light entering the channel, growth of in-channel vegetation including water crowfoot (*ranunculus fluitans*) and starwort (*callitriche stagnalis*) has increased. The Environment Agency have since been undertaking electro-fishing surveys to monitor brook lamprey, bullhead, brown trout and dace populations. Populations of trout have been observed.



A heavily degraded stretch of the River Shep, with little flow variation and no in channel vegetation.



Narrowed section of the Shep using faggot bundles.



Establishment of in-channel vegetation following channel narrowing.



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