

River Shep, RSPB Fowlmere Nature Reserve

Techniques: Faggoting, bed raising, riffle creation, hand weed cutting.

Project location: Fowlmere Nature Reserve

River: Shep

County: Cambridgeshire

Project start date: March 2006

Project end date: December 2009

Length: 600m

Cost: ~£14,000

Upstream grid reference: TL405451



Straight and overgrown section pre-restoration

Site background

The River Shep, a low gradient chalk stream, rises as springs at Fowlmere Nature Reserve. The river had been heavily dredged in the past, resulting in a distinct lack of gravel within the river, and the channel was over-deep and filled with silt. Long profile surveys also indicated that the natural profile of the river had been significantly altered. Following a site inspection by the River Restoration Centre, a series of recommendations to enhance the river were made in March 2005.

Low key habitat enhancement and management work had taken place in the river since 1997. Although the work sustained a very small population of brown trout and occasional plants of water-crowfoot, it was clear that the river needed more significant work that sought to specifically target known problems in the river's geomorphology (over-deep channel) and ecology (low habitat diversity).

Habitat restoration work then progressed in a more focussed manner in three phases:

- Riffle creation in March 2006 (~30m)
- Marginal habitat enhancement in 2007 (~150m)
- Bed raising combined with channel narrowing in 2009 (~250m)

Before 2007 all materials and labour for the management work was provided by the RSPB, using home-grown materials, and volunteers. By 2009 approximately 75% (450m) of 600 m of river within the site had been modified or managed by volunteers, using a combination of faggots, spiling and brushwood ledges when materials and labour became available. However, the most challenging sections (those where the channel was deepest) remained to be restored, and required specialist expertise and machinery.

Vegetation, including lesser water-parsnip, sedges, and water-crowfoot, is either cut from late April to October to sustain an open channel and create runs of faster moving water, or is retained to hold back water in drier periods.

Where deer regularly cross the river the bank has been reinforced with "log steps" to manage the situation rather than allow excessive bank erosion to deposit silt in the river.

Objectives

1. To improve the habitat quality of the river by restoring the natural profile
2. To enhance flow diversity by increasing sinuosity within the channel cross section and bed profile
3. To narrow the river to a more natural width, whilst providing suitable habitats for spawning trout and macro-invertebrates.
4. To increase the extent of water-crowfoot and water-starwort



the River Restoration Centre Case Study Series

This site was last visited by RRC staff in May 2010

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Project progression

- 2006 - a length of river had been identified with a gradient that enable bed raising by ~0.7m to form a riffle. The bed level was raised by the placement of 10 tonne of flint and gravel hoggin in an asymmetric undulating manner (rather than the usual smooth riffle). The material was then top-dressed with locally sourced 5-30mm graded gravel to give a natural appearance. The gravel was donated free of charge by a local quarry.
- 2007 - the channel was narrowed by using ash and hazel faggot bundles on both banks. Due to the deep organic silt that covered the bed (up 0.4m), the faggots could be pushed down into the silt and then levered into place, forcing the silt towards the banks to create a back-filled habitat ledge.
- 2009 - deeper reaches of the river were filled using clay-bound reject stone which was then covered with a suitable mix of 0.5-40mm gravel, flint and chalk. The material was placed in a controlled manner to restore the bed to the level prior to the 1980's dredging. Where required, a double layer of faggots with a hessian membrane was used to hold dredged silt.



A restored section of the River Shep, showing riffle creation with marginal vegetation developing.



River bed six months after work. The dark patches on the gravel are clumps of Simulium larvae.



Freshly placed gravel and chalk mix. Faggots are partially hidden and large woody debris is placed to give a more natural appearance.

Subsequent performance - RRC's views (2010)

The faggot bundles have successfully created a habitat ledge and reduced the channel to a more natural width. The gravel appears to have been well placed with minimum silt settling during 2010. The habitat has improved significantly, with water-crowfoot and water-starwort slowly increasing in the first year, but it is too early to detect any improvement in macroinvertebrate diversity or abundance. The firm and shallow bed enables the channel to be safely maintained by hand cutting. Trout are frequently observed within the channel.



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