



Advisory Visit

River Sence, Wistow, Leicestershire

September 2017



1.0 Introduction

This report is the output of a site visit undertaken by Tim Jacklin of the Wild Trout Trust to the River Sence near Wistow, Leicestershire on 14th September, 2017. Comments in this report are based on observations on the day and discussions with Karen Twine (Environment Agency Fisheries Officer), Jason Clarke, Peter Shelton and Richard Bartholomew of Fishing Sence Club.

This section of the River Sence was the subject of a habitat improvement project in 2002/2003 when the author was employed as Fisheries Technical Specialist at the Environment Agency. Documents relating to this project are appended to this report. At that time, the two greatest impacts on river habitat quality were:

- the physical alteration of the river channel as a result of past land drainage engineering;
- unrestricted livestock access to the watercourse preventing the establishment of a good quality riparian zone alongside the river.

An extensive fencing and tree planting scheme was planned, but largely shelved because the landowner was unwilling to commit to ongoing maintenance. A short section of fencing and tree planting was carried out at the upstream end of the reach (see below).

Normal convention is applied throughout the report with respect to bank identification, i.e. the banks are designated left hand bank (LHB) or right hand bank (RHB) whilst looking downstream.

2.0 Catchment / Fishery Overview

The River Sence rises to the east of Leicester, near Billesdon, and flows in a south-westerly then westerly direction to join the River Soar at Whetstone. This River Sence is one of two in Leicestershire, and should not be confused with the tributary of the River Anker, near Tamworth.

Fishing Sence Club have approximately 40 members and fish the river close to Wistow. The river contains mainly coarse fish, although trout to over 2lbs have been caught. The club used to introduce trout, but have not done so for several years. A deep substrate incubation box (for hatching trout eggs

in the stream) was tried for a few seasons after the abovementioned habitat project, but was onerous to maintain and did not produce any discernible improvement in trout catches. Non-native signal crayfish *Pacifastacus leniusculus* are present in the river here.

	Fishing Sence Club waters
River	River Sence
Waterbody Name	Sence from Burton Brook to Countesthorpe Brook
Waterbody ID	GB104028046620
Management Catchment	Soar River
River Basin District	Humber
Current Ecological Quality	Overall status of Moderate ecological status sustained through two assessment cycles from 2009 - 2016
U/S Grid Ref inspected	SP6526095685
D/S Grid Ref inspected	SP6526095685
Length of river inspected	~2km in total

Table 1. Overview of the waterbody. Information sourced from:

<http://environment.data.gov.uk/catchment-planning/WaterBody/GB104028046620>

Table 1 summarises the assessment by the Environment Agency of this part of the river under the Water Framework Directive. Through two cycles of assessment, it has achieved Moderate Ecological status overall. It is important to note that five ecological classes are used for WFD Water Bodies: high, good, moderate, poor, and bad. These are assessed against 'ecological status' and that anything ranked below good is classified as a failure.

The status of a waterbody is derived through classification of several parameters under the headings of ecology, water quality, physical condition, and specific pollutants. The overall status is then dictated by the lowest score amongst those parameters.

In 2016, the classification of Moderate Ecological Status was derived from a moderate score for invertebrates and dissolved oxygen, and a poor score for phosphate (although for some reason this did not cause the overall status to be 'poor'). Remarkably (given the habitat seen on this visit) fish was assessed as 'high' in both 2009 and 2016 and morphology (physical channel characteristics) assessed as 'supports good'.

3.0 Habitat Assessment

The main impacts on river habitat quality remain the same as in 2002/03 as noted above. The past land drainage works have lowered the river bed by around 2 metres, leaving a deeply incised channel which largely lacks a pool-riffle sequence and is disconnected from its floodplain. There is a lack of diversity of depths, with few deeper pools or wider, shallower riffles, limiting availability of fish habitat. At high flows, the over-sized channel has a far greater bank-full flow than would naturally be the case, making it a hostile environment for fish, particularly juveniles. In a less altered channel, the high flows would overtop into the floodplain more frequently, leading to a lower maximum stream power and providing calmer refuge areas for fish.

Restoring more natural channel dimensions would involve either raising the river bed level, lowering the floodplain level, or a combination of the two. Raising the river bed would involve importing large quantities of material (gravel) and could impact on the outfall from land drains and maybe increase flood risk. Lowering the floodplain level by re-profiling banks may be more feasible and would actually reduce existing flood risk. Material excavated would need to be transported off the designated floodplain area.



Photo 1 Wide view of the upper section of the fishery.



Photo 2 Closer view of the river showing a typical section with a deeply incised, uniform channel from past land drainage works.



Photo 3 Livestock access has widened the wetted channel and lowered the banks in some areas, leading to the retention of bed substrate (gravel) and formation of riffles, repairing to some degree the adverse impacts upon habitat of river engineering. However, this now needs to be built upon by improving riparian habitat and vegetation, by limiting grazing (fencing).



Photo 4 In contrast to Photo 3, the deeply incised character of the channel caused by river engineering persists in many sections. In straight reaches such as this, re-grading the banks to form an inset floodplain and widening the wetted channel in selected areas would promote riffle formation.



Photo 5 A typical area where livestock are accessing the river and poaching the banks. In this case it is preventing the establishment of a pool on the outside of the bend. Preventing grazing and establishing trees on the outside of the bend should promote pool formation.



Photo 6 An enclosure with planted trees on the lower river section.



Photo 7 Area which was fenced and planted with willow whips in 2003 (inset). In retrospect, a variety of tree species should have been planted including less vigorous sallows.



Photo 8 Cattle drink installed in 2003 (inset).

The second major impact on habitat quality is grazing by livestock. These are accessing the river in many areas causing bank poaching which widens and shallows the river and inputs excessive amounts of fine sediment.

On straighter sections of channel, the widening of the wetted channel and lowering of the banks by livestock trampling has alleviated some of the habitat damage caused by historical channel engineering; the effect has allowed gravel to be retained on the river bed forming a riffle (Photo 3). In areas where meanders occur, the same effect has had a less positive outcome (Photo 5); these areas are where deeper pools should naturally form, so retaining a narrower wetted channel and stable bank on the outside of the bend is desirable.

Grazing prevents the establishment of trees, meaning there are very few present along the banks. The absence of trees and their shade leads to higher water temperatures (trout's maximum tolerance is in the low 20s Celsius), more in-stream vegetation such as rushes and reeds and less cover from roots and trailing branches that can provide good fish habitat.

Establishing better riparian habitat, including trees, means fencing out livestock. Members of the club indicated during the visit that the landowner is unlikely to agree to long lengths of fencing and tree-planting because of the increased maintenance burden created. However, it may be possible to create smaller, targeted stock exclosures, following the example of existing areas (Photos 6 & 7) and the area at the upstream end of the fishery which was fenced in 2003.

4.0 Recommendations

- Re-profile the river banks with the aim of creating an inset floodplain (Figure 1). Seek advice from a fluvial geomorphologist on the dimensions of the channel and floodplain level.
- Fence livestock out of the river wherever possible. If long lengths of fencing are not possible, create exclosures and plant trees, similar to the existing areas (Photos 6 & 7). A mixture of native tree species should be used, avoiding the more vigorous willow species. Sallows (*Salix cinerea* and *S. caprea*) are appropriate close to the water. Elsewhere appropriate species include hornbeam, oak, wild cherry,

silver birch, field maple, downy birch, aspen, alder, small-leaved lime, rowan, hawthorn, hazel and alder buckthorn. Further advice and potential financial help with tree planting is available from the Woodland Trust (www.woodlandtrust.org.uk/plant-trees).

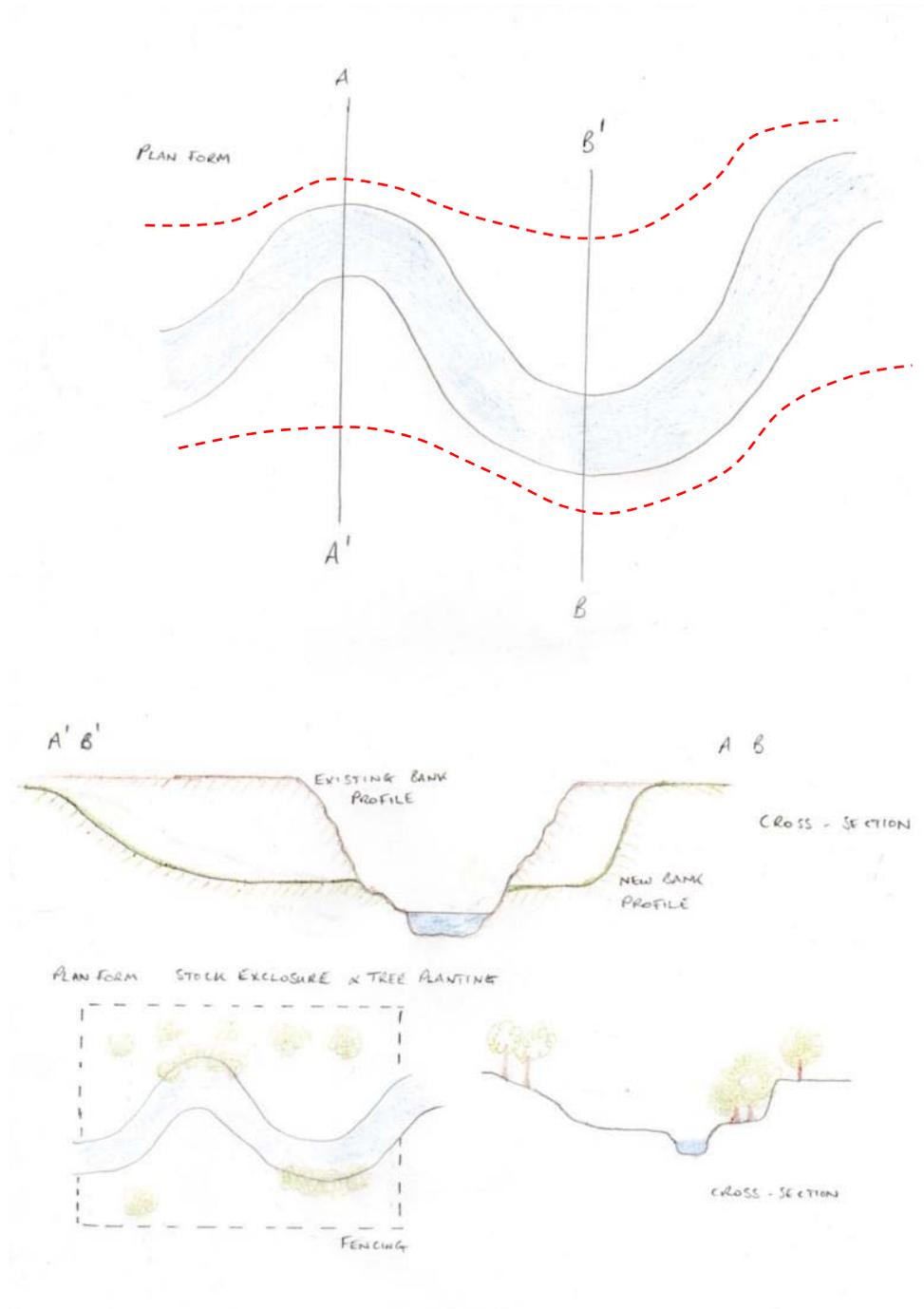


Figure 1 Indicative diagram of bank reprofiling. An inset floodplain is created (at a level based on geomorphologist's advice). On meanders, the inside of the bend is pulled back more than the outside. On straighter sections, the re-profiling is more symmetrical and could be combined with widening the wetted channel to retain gravel and create riffles. Stock enclosures and tree planting could be located in meander areas to provide cover and bank stability on the outside of the bend. Fencing on both banks will be required to prevent stock crossing the river via the lowered banks.

- Ensure the existing fencing in the area of Photo 7 remains stockproof. Thin out the willow trees in this area by partially cutting and laying (like hedge laying). “Singling” (cutting to retain just one main stem) of some the willows is recommended to avoid a proliferation of multi-stemmed regrowth; the remaining stem can be subsequently managed as a pollard.

5.0 Making it happen

Wild Trout Trust can provide further advice and guidance on producing more detailed plans and costings. It is recommended that agreement in principle to proposals is secured from the landowner before further resources are committed to the project.

We have produced a 70 minute DVD called ‘Rivers: Working for Wild Trout’ which graphically illustrates the challenges of managing river habitat for wild trout, with examples of good and poor habitat and practical demonstrations of habitat improvement. Additional sections of film cover key topics in greater depth, such as woody debris, enhancing fish stocks and managing invasive species.

The DVD is available to buy for £10.00 from our website shop <http://www.wildtrout.org/product/rivers-working-wild-trout-dvd-0> or by calling the WTT office on 02392 570985.

The WTT website library has a wide range of materials in video and PDF format on habitat management and improvement: <http://www.wildtrout.org/content/library>

6.0 Acknowledgement

The WTT would like to thank the Environment Agency for supporting the advisory and practical visit programme in England, through a partnership funded using rod licence income.

7.0 Disclaimer

This report is produced for guidance; no liability or responsibility for any loss or damage can be accepted by the Wild Trout Trust as a result of any other

person, company or organisation acting, or refraining from acting, upon guidance made in this report.

River Sence, Wistow

Habitat Improvement Project Plan

The project covers three main activities: fencing; planting; replacement of existing stone dams with gravel riffles. Each activity is detailed below.

1. Fencing

See 1:2500 map (Map 1). The proposed lengths of river to be fenced are:

- Existing fencing (sheep netting topped with single strand of barbed wire) marked in **blue**. To be renewed with same.
- New fencing (sheep netting topped with single strand of barbed wire) marked in **red**.
- New fencing (4 strands of plain wire topped with single strand of barbed wire) marked in **green**.

The new fencing will include two swing gates for livestock access at the point marked on Map 1, specification as detailed in Figure 1; and stiles for pedestrian access at various points.

2. Planting

Planting will take place on the inside of meanders as indicated on Map 1 (green tree symbols) with hawthorn and white willow (*Salix alba*) (Figure 2a).

Planting with low-growing osier (*Salix viminalis*) and sallow (*Salix caprea*; *S. cinerea*) in the form of stakes will take place on the slope of the banks in areas of severe erosion, as marked on Map 1 by the blue hatched shading (Figure 2b).

3. Replacement of stone dams with gravel riffles

At present there are four stone dams in the river channel in the lower field (Map 1). It is proposed to remove these and replace with gravel riffles (Figure 3). Level markers will be driven into the river bed upstream of the existing dams and the new works will be designed so as not to increase the existing upstream head level.

Fisheries Project Summary

Title: River Sence Fisheries Habitat Rehabilitation (2002/03)

Location: River Sence, Wistow, Leicestershire (SP65289576)

Contact: Tim Jacklin, Fisheries Technical Specialist (Trent Catchment)

A project was carried out on the River Sence, Leicestershire, a small lowland river where habitat has suffered from historic land drainage practices and unrestricted livestock access. The banks of the river suffer from poaching by livestock, leading to increased erosion and large amounts of sediment washing into the river, smothering gravel used by fish as spawning areas.

A section of the river was fenced to prevent livestock access, and a dedicated cattle-drink was installed. Low-growing willows (osiers and sallow) were planted into eroded banks to bind them and prevent sediment washing into the river. Existing mature crack willows along the river were pollarded to extend their life.



Left:

Poached and eroded banks fenced off, with low growing willow whips planted into the banks.

Right:

Livestock drinking area.



Future maintenance will be carried out by the angling club, who are also installing a deep-substrate incubation box for trout eggs with advice from Agency Fisheries staff.