



**Advisory Visit**

**River Sence, Leicestershire**

**11<sup>th</sup> September, 2008**



## **1.0 Introduction**

This report is the output of a site visit undertaken by Tim Jacklin of the Wild Trout Trust (WTT) on the River Sence on 11<sup>th</sup> September, 2008.

Comments in this report are based on observations on the day of the site visit and discussions with Mark Owen and Neville Walker of Gopsall Fishing Club. The club were the recipients of a WTT Advisory Visit in June 2004 and have since implemented an extensive habitat restoration programme on their waters. The work was recognised in 2007 when the club won the amateur category of the WTT & Orvis Conservation Award.

This visit was to sections of the River Sence upstream of the club's current section of river, with a view to extending the habitat restoration work already carried out.

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 Fishery Overview**

The sections visited are not presently fished, but being upstream of the club's current fishery are of considerable importance in terms of spawning and juvenile habitat, and the production of wild trout. Adult brown trout run upstream in autumn to spawn and their offspring subsequently spread out downstream, so good habitat in these areas is key to healthy wild trout populations in the club's fishery.

The areas visited can be conveniently split as follows:

- Help Out Mill
- Upstream of Newton Burgoland Marshes SSSI
- Upstream of Tucker's Holt
- Downstream of Heather Brickworks
- Shackerstone, Ibstock Brook and Bosworth Brook

### 3.0 Habitat Assessment

#### 3.1 Help Out Mill (SK378078)

Downstream from the mill is the upstream limit of the water currently fished by Gopsall Fishing Club. The LHB is wooded, and the RHB is currently has a maize crop. Cultivation of maize can cause a problem with run-off of fine sediments from exposed soils during the winter; this can clog spawning gravels reducing the survival of trout eggs. However, there is a wide uncultivated field margin between the crop and the river in this location which should provide an adequate buffer against soil erosion (Photo 1).

An area of shallow water with a well-sorted gravel substrate and beds of water crowfoot (*Ranunculus* sp.) is present immediately below the mill bridge (Photo 2). This is good spawning habitat and is a result of the river bed scouring caused by the narrowing of the river channel under the bridge. Just downstream of this area are other areas of less well-sorted gravel.

Upstream of the mill the RHB is a wheat field (which was grass last year) giving way to a wooded section, with game bird rearing pens. A ford links the wheat field to a field of grass and clover on the LHB. There is a good marginal strip alongside the river here on the LHB, fenced 4 to 5 metres away from the river. The banks are wooded with ash, hawthorn, sycamore, wych elm (larger trees dying), horse chestnut and field maple, and the canopy is heavily shading the river channel. The trees are shading out low-growing vegetation on the river banks, leaving some areas of exposed soils vulnerable to erosion potentially over-widening the channel (Photos 3-5).

The river bed here is comprised of gravel of an ideal size for trout spawning, and there is a good bed profile with a pool/riffle sequence. The gravel is not particularly well-sorted, except in areas where LWD occurs in the channel; here bed scouring has deepened areas and thrown up banks of well-sorted gravel ideal for trout spawning (Photo 6).

#### Recommendations

- Use large woody debris (LWD) to create scour of the poorly sorted gravel substrate downstream of Help Out Mill.
- Reinforce the approaches to the ford with suitable material (ideally gravel, otherwise hardcore) to prevent trampling of the banks in these

areas by livestock, and generation of fine sediment input to the river. Create suitable barriers to guide livestock across the ford and prevent straying in the river channel.

- Selectively thin the canopy of trees upstream of the mill, pollarding or coppicing appropriate trees on a rotational basis. Be careful to consider bats when planning tree works (large trees with cracks, crevices and ivy coverings are favoured by bats, a species with strong legal protection – if unsure seek professional help). Also leave standing any existing dead trees (Photo 7) as these are valuable habitat for invertebrates and birds (e.g. woodpeckers).
- Use the arisings from the tree management to introduce more LWD to the river channel to encourage scouring of the river bed and sorting of gravels.
- Retain and encourage low cover over the river channel, particularly where there are spawning riffles, as this will provide security for adult fish and encourage them to use these areas.



Photo 1 A good margin between the maize crop and river





Photo 2 Well-sorted gravels downstream of mill bridge



Photo 3 Ford

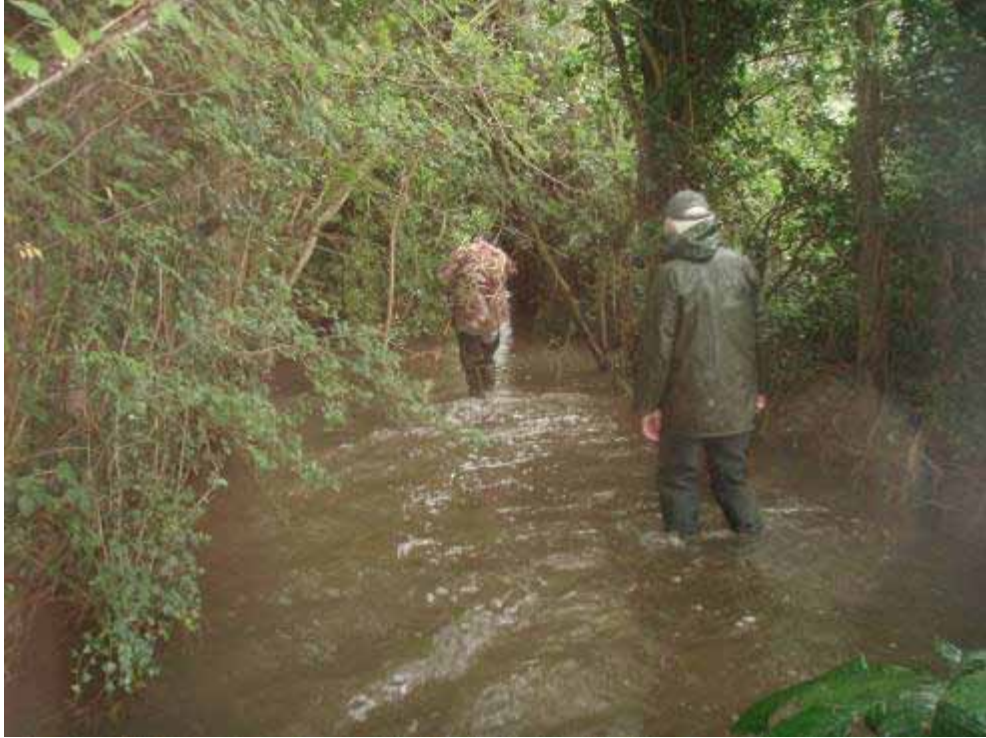


Photo 4 Heavy shading of river upstream of Help Out Mill



Photo 5 Exposed banks under the shady canopy





Photo 6 LWD scouring a pool and throwing up well-sorted gravel



Photo 7 Leave dead trees standing

### 3.2 Newton Burgoland Marshes SSSI

Newton Burgoland Marshes SSSI comprises four units located in two separate areas alongside the river totalling 8.65 Ha. The reason for notification is because the site includes some of the best remaining examples of neutral alluvial grassland and marsh in Leicestershire and is representative of such habitats in Central and Eastern England ([http://www.english-nature.org.uk/citation/citation\\_photo/1001033.pdf](http://www.english-nature.org.uk/citation/citation_photo/1001033.pdf)).

The river was inspected here between the farm bridge (SK 37994 08498) and the road bridge (SK 38053 08765). The club have a good relationship with Natural England (NE) and have an access agreement with NE onto Unit 1 of the SSSI (field on the LHB over the farm bridge), for management of the banks, including access for 4x4 vehicles, tree management, fencing, and mowing brambles.

Upstream of the farm bridge the instream habitat is very good, some of the best on the River Sence. There is a pool riffle sequence, gravel substrate and good examples of LWD, including vegetated midstream islands and low cover over potential spawning riffles (Photo 8). There are plenty of opportunities on this stretch to introduce more LWD where there are willows already leaning over the river channel, and from arisings from tree management (Photo 9).

The club plan to fence both banks here and provide mains-supplied drinking troughs for livestock. Currently the RHB was very lightly grazed, but previous years have seen more intensive use.

There are currently some tall willows along this section which would benefit from pollarding on a rotational basis (Photo 10). Units 2 and 4 of the SSSI (upstream of the road bridge) have an 'unfavourable recovering' status, and NE recommend scrub/hedge cutting and willow pollarding. It would make sense to liaise with NE and see if any of the works proposed for the river could be designed to help achieve favourable status for these units.

Close to the road bridge there is an area of river where there used to be a weir which diverted water down a leat to Help Out Mill. The weir was removed in the 1970s by the Severn Trent Water Authority. The mill still enjoys a right to water and it is understood there may be plans to reinstate a supply for occasional milling for demonstration (tourism) purposes.



## Recommendations

- Pollard the larger willows along this section on a rotational basis. This will reduce shading of the river channel, promoting growth of instream weed such as water crowfoot, and prevent the loss of large trees which could remove the root ball from the banks creating areas vulnerable to erosion.
- Introduce LWD to the river channel using arisings from tree management, or where there are existing opportunities in the form of leaning trunks and boughs.
- Liaise with Natural England over works which may improve the status of the SSSI.
- Keep a watching brief on plans to reinstate the water supply to the mill. This would involve impoundment of the river and may have consequences for the river habitat upstream, and free passage of fish.



Photo 8 Excellent habitat created by LWD and colonisation by vegetation



Photo 9 LWD waiting to be lowered into the river channel



Photo 10 Larger willows would benefit from rotational pollarding

### 3.3 Upstream of Tucker's Holt

This section has a reasonable bed profile with a pool/riffle sequence, however the gravel is compacted, poorly sorted and contains a lot of fine sediment. There is also a lot of sand deposited on low banks and in the margins, suggesting a possible input of fine sediment upstream of this reach. With progress upstream, the river bed comprises areas of bedrock, and in one area 'gravel' consisting of 'pebbles' of hard clay.

The reach is heavily shaded, mostly by hawthorn, and there is little instream vegetation (Photo 11).

There is a weir (SK 38719 09742) with a crest height of approximately 0.6 m, and a large weir pool downstream. The weir presents a considerable obstacle to fish migration, and appears to be a redundant structure with no evident water take-off points upstream (Photo 12).

The nationally threatened native white-clawed crayfish (*Austropotamobius pallipes*) have been found this year in this area. Upstream of the weir numerous signs of otter activity (spraints, footprints) have been seen during surveys by EA Biodiversity staff.

There is a considerable amount of maize cultivation alongside this reach, particularly on the RHB which has a moderate slope down towards the river. Access to the river involved crossing a ditch alongside one maize field, and this may be a potential pathway for fine sediment entering the river.

#### Recommendations

- Remove the weir to facilitate free movement of fish within and between reaches of the river. Barriers to movement restrict daily and seasonal movements to access habitats for spawning, feeding and shelter and thereby limit fish populations.

Removal will require the agreement of the owner of the structure (understood to be Crown Estates), and liaison with the Environment Agency. The Water Resources department of latter will be able to advise if there are any rights of abstraction dependent upon the structure, and whether an impoundment licence is necessary for removal (contact Gill Roe). A Land Drainage consent will be required





Photo 11 Heavily shaded channel



Photo 12 Weir and weirpool upstream of Tucker's Holt

and EA Development Control department (Sarah Mallett) should be consulted.

The presence of species with a high conservation value (native crayfish and otter) means it is essential that advice is sought on protecting these species during works, and an Environmental Impact Assessment (EIA) is likely to be required. It is recommended that EA Biodiversity staff are involved in the project at the earliest opportunity.

- Manage bankside trees to create dappled shade along the river, and use arisings from tree management to introduce LWD to the river channel. LWD will provide good habitat for crayfish in addition to benefits to the river bed profile and substrate composition.
- Investigate the source of fine sediment inputs. Check the river during wet weather in the winter when vegetation has died back, and look for pathways for the ingress of fine sediment from fields, roads, land drains, etc.
- Ensure all equipment and clothing has been thoroughly dried or disinfected before accessing the river, to prevent the introduction of crayfish plague.

### 3.4 Downstream of Heather Brickworks

This section was accessed from the bridge behind Heather Brickworks at SK 39202 10274, and was walked in a downstream direction. The LHB is a grass field and the RHB a maize crop, giving way to Heather Wood, a Forestry Commission site with public access for woodland walks in this part of the National Forest.

The channel here is straight and quite deeply incised suggesting past land drainage works have occurred. The channel is open, with a few hawthorn bushes and the odd small willow on the banks (Photo 13). Downstream of the grass field (LHB) there are more trees and the channel becomes more shaded. There was only one small example of LWD in this section.

The river bed here is mainly sand and silt, with very occasional areas of gravel and some exposed clay. There is little depth variation, most of the reach being about knee depth. The submerged plants present were

slow/stillwater species including Canadian pondweed (*Elodea canadensis*) and water-milfoil (*Myriophyllum* sp.). Emergent vegetation comprised bur-reed (*Sparganium erectum*), and reed canary-grass (*Phalaris arundinacea*), the latter having substantially reduced the channel width: further evidence of previous channel works creating an over wide channel.

This section of river is very poor habitat for trout, other fish species and wider biodiversity.

### Recommendations

- Ideally this section of the river needs major works to re-meander the channel, raise the bed level and reprofile the banks to reconnect the river with its floodplain. This would be a major project involving heavy machinery, the importing of large quantities of gravel and movement of large quantities of spoil.
- In the short term LWD could be introduced to promote scour of the river bed and increase depth variation.



Photo 13 Straight, incised channel downstream of Heather Brickworks



### 3.5 Shackerstone, Ibstock Brook and Bosworth Brook

#### 3.5.1 Shackerstone

A short section of river downstream of the bridge at Shackerstone (SK 37806 06738) was inspected, between the Oaklands and Upper Cricket Field beats of Gopsall Fishing Club's waters (Photo 14). The section is open with lightly grazed fields on both banks, and beds of water crowfoot channelling the flow over some good gravels. The river flows under the canal aqueduct at the downstream end of this section. There is little need for improvement on this short section. A watching brief should be maintained on the level of livestock in the fields and their impact upon the banks, and possibly some LWD introduced on the straighter section.

#### 3.5.2 Ibstock Brook

The Ibstock Brook joins the River Sence near Shackerstone at the downstream end of the Oaklands beat (SK 378 068). The brook is in a very incised channel and 60-70% shaded by trees meaning little light reaches the river bed and there is consequently an absence of instream vegetation. The absence of emergent and submerged weed and the straightened nature of the channel results in the river bed being comprised of fine, poorly sorted substrate, and a homogenous shallow depth profile. (Photo 15)

Currently the habitat in the brook is generally poor and of little value for trout. Rotational coppicing and pollarding may improve light penetration, but the incised nature of the brook could still be limiting. The introduction of gravel to raise the bed level, in combination with LWD and tree management would improve conditions and potentially create areas of spawning and juvenile trout habitat.

#### 3.5.3 Bosworth Brook

The Bosworth Brook joins the Sence downstream of Bilstone on the lower section of Gopsall Fishing Club's waters (SK363042). The brook has a better sediment profile than the Ibstock Brook, with more gravel present, and it is in a less incised channel. There is some depth variation, but the channel is very straight and examination of a parish boundary (on OS map) which followed the previous course of the brook confirms the brook has been previously straightened (Photo 16).



Photo 14 River Sence at Shackerstone, upstream of the aqueduct



Photo 15 Ibstock Brook – heavily shaded, incised, straightened channel



Photo 16 Bosworth Brook

The section up to the footbridge at SK 36668 04375 was walked. This bridge is the upper limit of an EA electric fishing survey site, and wild brown trout have been caught here on surveys. The brook has a hawthorn hedge along much of the LHB, interspersed with some pollarded willows. There are opportunities to hinge some of the pollard re-growth and pin into the river channel to create flow variation and bed scour.

A good example of where in-channel structure has created better habitat was seen where two strands of barbed wire had been strung across the channel at a field boundary. The wire had sagged into the brook and formed a small debris 'dam' under which the flow had scoured a pool and thrown up a bank of sorted gravel downstream. Mimicking these effects with introduced structures is the key to improving trout habitat on this brook (Photos 17 and 18).

Just upstream of the Bosworth Brook – Sence confluence, on the main river, a weir was inspected (SK 36353 04412) (Photo 19). The weir has a sloping face with the facility to insert two weir boards (telegraph poles) about halfway down at a break in the gradient of the glaxis; the club routinely leave the weir boards out. The weir is a considerable obstacle to the free



passage of fish, because of the fast flow of water on the sloping face. It may be possible to improve the structure in terms of fish passage with a relatively simple easement.



Photo 17 Debris dam caused by barbed wire...



Photo 18 ...and the gravel scoured and cleaned as a result.

## Recommendations

- On the Ibstock and Bosworth Brooks, manage bankside trees to create dappled shade along the river, and use arisings from tree management to introduce LWD to the river channel. Faggot bundles and stakes should be used for channel narrowing and midstream islands, and LWD should be installed to promote bed scour. Work on the Bosworth Brook would deliver more benefit more quickly than the Ibstock Brook. The latter would also require the bed level raising by introducing gravel which would increase costs.
- Improve fish passage at the weir on the main river. The options and process for improving fish passage are set out in the Environment Agency's Fish Pass Manual (available from Greg Armstrong [greg.armstrong@environment-agency.gov.uk](mailto:greg.armstrong@environment-agency.gov.uk)). These include removing the obstacle, or constructing a fish pass, bypass channel, or easement. The latter is probably the least expensive option and requires less formal authorisations than other options.

The EA's National Fish Passage Panel (NFPP) can be consulted for advice on improving fish passage. It is recommended that more information is gathered regarding the structure (using as a template the fish pass concept form, Appendix IV of the above manual), and the NFPP's opinion sought via Greg Armstrong.

### **Please Note:**

**It is a legal requirement that all the works to the river require written Environment Agency (EA) consent prior to undertaking any works, either in-channel or within 8 metres of the bank.**



Photo 19 Weir on the Sence upstream of Bosworth Brook confluence

#### **4.0 Making it Happen**

This Advisory Visit was delivered under an agreement between the EA, Gopsall Fishing Club and WTT, where the EA are providing some financial support from the Fisheries Project budget towards the cost of improvements highlighted by the WTT. Gopsall Fishing Club is project managing the works.

Clearly some of the recommendations in this report are beyond the scope of the funding agreed so far, for example weir removal and the recommendations for the Brickworks section. The WTT may be able to assist with an AV Bursary to use as matched funding towards the costs of larger projects. Also the WTT can assist with producing worked-up project proposals for use in obtaining consents and bidding for funds.

Practical Visits are also available from WTT to demonstrate river habitat improvements techniques, although it is recognised Gopsall Fishing Club already have good experience gained from previous projects.

All applications for further assistance from WTT should be directed to [projects@wildtrout.org](mailto:projects@wildtrout.org) .



## **5.0 Acknowledgements**

The Wild Trout Trust is grateful to the Environment Agency for providing the financial support to make this Advisory Visit possible.

## **6.0 Disclaimer**

This report is produced for guidance only and should not be used as a substitute for full professional advice. Accordingly, 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 comments made in this report.