Advisory Visit

River Perry, Shropshire

30th March, 2009

1.0 Introduction

This report is the output of a site visit undertaken by Tim Jacklin of the Wild Trout Trust on the River Perry near Shrewsbury, Shropshire on 30th March 2009. Comments in this report are based on observations on the day of the site visit and discussions with Mr. & Mrs. Stephens (landowners), Tim Lardner (fishing syndicate member), Jolyon Fallon (Assistant Land Agent) and Chris Bainger (Fisheries Technical Specialist, Environment Agency).

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 River Perry rises in the low hills on the boundary of the North Shropshire sandstone plain and flows south to join the Severn near Shrewsbury. The underlying geology is mostly Bunter Sandstone, overlain with a complex mixture of glacial deposits and soils. In its headwaters it is a stony-bedded stream with a gradient falling from 30 to 15 metres per kilometre ($m.km^{-1}$), reducing to between 5 and 7 $m.km^{-1}$ below Gobowen where it flows through alluvial silts and clays (Harper, 1990).

The Perry then enters Baggy Moor, a large depression of basin peat where the river gradient is 1 $m.km^{-1}$ or less. Much of the channel in the upper catchment of the Perry has been heavily modified to improve drainage for agriculture. Main and tributary channels have been extensively canalised; for example a scheme in 1985-88 lowered the river bed by 1 metre between Rednal and Ruyton to increase the drainage of Baggy Moor and intensify agricultural land use.

The Perry has been the subject of studies into the effects of canalisation (land drainage) on fish populations, and the effectiveness of in-stream structures in mitigating these effects (Swales, 1982; Swales & O'Hara, 1983); More recent studies have been completed by Ros Challis of the Environment Agency.

After Baggy Moor and downstream of Ruyton the character of the river changes markedly. Its gradient increases to 2 $m.km^{-1}$ and it flows over

boulder clay and glacial debris, the channel bed becoming predominantly stony, interspersed with large rocks and boulders. This is the only section remaining downstream of Gobowen with its natural meander patterns and pool-riffle sequences (Harper 1990).

The reach visited is located in this latter section, near Yeaton, and extends for approximately 3.6 km between Adcote (upstream) and Mytton Mill (downstream). Mytton Mill is located about 1.5 km upstream of the confluence of the Perry and the River Severn.

The upper section is single bank fishing (RHB) and the lower section is double bank fishing. There are 12 members of the fishing syndicate, and about 350 brown trout of 9 – 11" are stocked each year.

3.0 Habitat Assessment

Generally the in-stream habitat on this section of the River Perry is very good. There is a natural meandering course and a pool-riffle sequence, with deep lateral scour pools located on bends and shallower, faster water downstream. This creates a variety of water depths and flow velocities within the channel, suitable for a range of river fish species and life-stages, from juvenile to adult. Environment Agency electric fishing data show the fish present include brown trout, grayling, chub, dace, salmon parr, eel, roach, bullhead, stone loach and minnow (Appendix 1).

The shallow, faster, gravel-bottomed sections of water (riffles) are where most river fish species choose to spawn, including trout and salmon. Loose, un-compacted gravel containing a low proportion of fine (<2 mm) sediments is very important for the survival of incubating trout and salmon eggs and alevins, which spend several weeks buried in gravel nests (redds) cut into the gravel by the adult female fish.

The riffle areas on this part of the Perry contained a high proportion of fine sediment and were compacted; this is very likely to compromise the survival of trout and salmon eggs and alevins and represents a bottleneck in the lifecycle of these fish (see page 16 of the Wild Trout Survival Guide provided during the visit). The origins of this sediment are believed to be intensive arable farming (including potatoes) higher up the catchment, and the fast run-off from areas such as Baggy Moor which have been subject to land drainage schemes.

Photo 1 Deep pools on the outside of meanders, often with submerged tree roots, provide ideal habitat for adult fish

Photo 2 Shallow, fast-flowing, gravel-bedded riffles provide spawning habitat, although fine sediment affects their quality in the Perry. Low cover over riffles is important for security of spawning adults from predators.

Photo 3 Shallower sections with abundant water crowfoot provides very good juvenile fish habitat

Photo 4 Good riparian habitat on the near bank (behind a fence), compared to a much less favourable margin on the far bank (grazed and unfenced).

Photo 5 Excellent 'scruffy' margins to the river, providing valuable over-hanging winter cover

The majority of the banks controlled by Mr & Mrs Stephens are fenced or have a generous margin between cultivated land and the river. This reflects the fact that the most of the land adjacent to the river is in agri-environment schemes such as Entry Level Stewardship, and much is in Countryside Stewardship or Higher Level Stewardship (www.defra.gov.uk/rural/rdpe/erdp/schemes/index.htm). The protection afforded by these strips alongside the river has allowed excellent marginal habitat to develop, providing good habitat for fish (in the form of trees, shrubs and overhanging vegetation), largely stable banks with little erosion, and good habitat for wildlife, including otter and kingfisher. It is important that the marginal fringe of vegetation is retained when creating access for angling, and preferably access and egress points are created, between which the river is fished by wading.

There is abundant growth of water crowfoot (*Ranunculus* sp.) in the faster, less shaded sections of the river. This provides excellent habitat (cover) for trout and salmon, particularly the juveniles (parr) in shallower parts of the river. It is also an important habitat for invertebrates including the nymphs of upwinged flies which are important to the angler, such as olives (*Baetis* spp.) and blue-winged olives (*Serratella ignita*).

It is understood that the growth of aquatic weed can be prolific in summer, probably because of nutrient enrichment of the river. The Environment Agency or predecessors used to employ a weed cutting boat, but it is thought that this no longer occurs. Weed cutting is practiced widely by riverkeepers on the chalkstreams of southern England, but it requires some careful thought before such management is undertaken. The timing and extent of weed cutting has implications for re-growth, water levels, juvenile fish survival and the temperature and oxygen levels of the water. For a full explanation see the section on vegetation management in the Wild Trout Trust's Chalkstream Habitat Manual (www.wildtrout.org/images/PDFs/ChalksteamManual/9%20management_of_riparian_part1.pdf).

There are one or two examples of large woody debris (LWD) within the river channel. LWD is a general term referring to all wood naturally occurring in streams including branches, stumps and logs. Almost all LWD in streams is derived from trees located within the riparian corridor. Many land managers treat LWD as a nuisance and remove it from rivers and streams. However, streams with LWD have greater habitat diversity as it promotes localised scour, depth variation and a natural meandering shape. LWD is an essential component of a healthy stream's ecology and is beneficial by maintaining the diversity of biological communities and physical habitat. Stream clearance reduces the amount of organic material which supports the aquatic food web, removes vital in-stream habitats that fish will utilise for shelter and spawning and reduces the level of erosion resistance provided against high flows. A relaxed approach to managing LWD is far easier and cheaper than installing flow deflectors and groynes, and usually achieves similar or better results.

The invasive plant, Himalayan balsam (*Impatiens glandulifera*) was noted on some sections of the river, particularly the lower section above Mytton Mill. The main issue with this species is its rapid rate of spread and the physical damage that it causes to river systems by blanketing river banks; being an annual it shades out other species during the growing season, but provides no soil retention over winter leading to erosion problems and sediment inputs.

Photo 6 An example of relatively recent LWD, starting to accumulate sediments here, and scour deeper water here.

Photo 7 An example of older LWD. The accumulated sediment below the fallen willow has consolidated and vegetated, narrowing and deepening the channel. This picture is immediately d/s of Photo 3.

Photo 8 Himalayan balsam seedlings starting to sprout

4.0 Recommendations

- Probably the most significant issue facing the fishery on the Perry is the sediment input from upstream, and this is something that needs to be addressed on a catchment-wide basis. It is recommended that support is given to organisations tackling issues at this level, such as the newly formed Severn Rivers Trust (www.severnriverstrust.org.uk). The issue should also be raised with local and national government representatives.

- Although it is treating the symptoms rather than the root cause of the problem, there are some actions that could be taken within the local river reach to counteract the effects of sedimentation. These include gravel jetting, retention of large woody debris (LWD) and placing flow deflectors in selected areas:

Gravel jetting

It is suggested that the gravels are 'jetted' using a high pressure pump or backpack leaf blower to purge the gravel matrix of fine silts to provide suitable conditions for trout eggs and alevins to develop to 'swim-up' fry

stages. Spawning gravels are also important habitat for invertebrates and plants too and operators should avoid the temptation to clean 100% of the available spawning resource. A programme of rotational jetting doing no more than 25% in any one year (4-year rotation) is a sensible option. Spend the winter preceding any jetting operations identifying areas were trout redds occur; this will enable you to target your time more efficiently. Undertake jetting in October prior to spawning season. On no account do it later than this or you may be causing more damage than you are trying to rectify. Ensure that the EA is consulted prior to gravel cleaning, as it may require permission, and it is sensible to forewarn downstream interests.

Photo 9 Cleaning gravel with a pump and lance

Photo 10 Cleaning gravel with a leaf blower

Retaining LWD

LWD promotes the development of a range of habitats including localised scour which keeps patches of gravel clean and sediment free; these will be actively sought out by spawning fish (Photo 11). Adopt a policy of retaining LWD in the river channel wherever possible. The West Country Rivers Trust provides a useful guide to the management of natural LWD:

1. Is the debris fixed, if yes then continue to 2, if not continue to 5.

2. Is the debris causing excess erosion by redirecting the current into a vulnerable bank? If yes then go to 5 if not then go to 3.

3. Would fish be able to migrate past it (take into account high river flows). If yes got to 4, if no go to 5.

4. **Retain the woody debris in the river**.

5. **Reposition or extract the debris.**

Note: If the debris dam needs to be removed but there is still a significant amount of the root system attached to the bank then it is recommended that the stump be retained for its wildlife habitat value and its stabilising effect on the bank.

Photo 11 An example of clean gravel 'blown up' below some LWD on the River Loddon

Flow deflectors

Positioning flow deflectors or groynes on shallow gravel areas will promote localised scour in a similar way to LWD. Figure 1 shows the effects of flow deflectors depending upon how they are positioned.

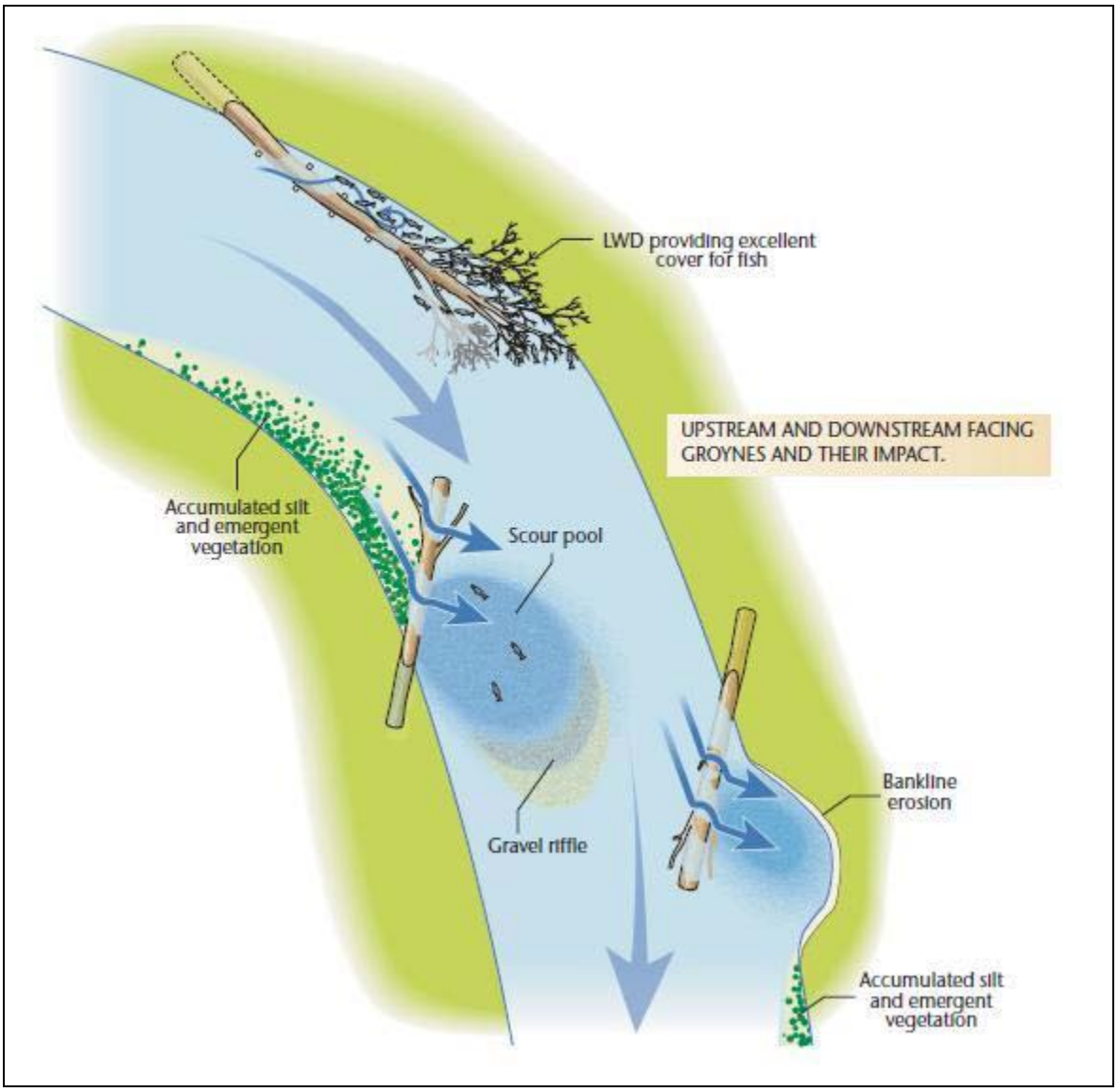

Figure 1

- Consider an early switch to using non-breeding (triploid) brown trout as stock fish. The Environment Agency's National Trout and Grayling Strategy has recently introduced a policy that will make it compulsory to use non-breeding (triploid) brown trout when stocking rivers (http://www.environment-agency.gov.uk/business/sectors/39903.aspx). This policy will be phased in, becoming mandatory in 2015, and is to protect wild populations from the damaging effects of interbreeding with farmed, domesticated strains of brown trout.

- Take steps to control Himalayan balsam, preferably in conjunction with other riparian interests on the Perry. Advice on controlling invasive plants

can be found on the Environment Agency website at http://www.environment-agency.gov.uk/homeandleisure/wildlife/31364.aspx. Control can be achieved by physical or chemical means:

Physical Control

The main method of control, and usually the most appropriate, is pulling plants before they flower and set seed. Working parties are the best means of doing this. The arisings from this work should be stored above ground level (e.g. on fence panels raised 30cm above the ground) until they have dried out to prevent continued growth.

Chemical Control

Before using weedkillers alongside waterways it is necessary to contact the Environment Agency and obtain their written consent via form WQM1 (http://www.environment-agency.gov.uk/static/documents/Leisure/wqm1_form_1797463.pdf) . It can advise on suitably qualified contractors, as can the National Association of Agricultural and Amenity Contractors (Tel: 01733 362920).

Himalayan balsam can be controlled with a weedkiller based on glyphosate, such as Roundup. Glyphosate is a non-selective, systemic weedkiller that is applied to the foliage. It is inactivated on contact with the soil, so there is no risk of damage to the roots of nearby plants, but care must be taken that the spray doesn't drift onto their foliage. Glyphosate is most effective when weed growth is vigorous. This usually occurs at flowering stage but before die-back begins; with most weeds, this is not earlier than mid-summer.

It may take a couple of seasons to obtain good control due to the germination of more weed seedlings.

- Take part in the anglers' invertebrate monitoring initiative instigated by the Riverfly Partnership. This will enable volunteers to monitor water quality in the river and provide an early warning of pollution and a deterrent to potential polluters. Details of sampling strategies and training days can be obtained from the Riverfly website at www.riverflies.org . Contact Bridget Peacock riverflies@salmon-trout.org for further details. Suitable nets for sampling macroinvertebrates can be obtained from Alana Ecology www.alanaecology.com Tel: 01588 630173

- Where riverside fencing is being erected or replaced, try to ensure a generous riverside margin which will provide good habitat and allow maintenance for angler access. Alternative drinking sources for livestock could be provided via mains-fed troughs, or with pasture pumps. See http://www.grazinganimalsproject.org.uk/gap_information_leaflets.html?publication=1;33 for further information.

Photo 12 Cow using a pasture pump

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.

5.0 Making it Happen

The WTT can provide further assistance to implement the recommendations, including:

- Assistance with preparing project proposals and Land Drainage consent applications

- Support at pre-application meetings with the relevant departments of the EA, if necessary.
- A WTT 'Practical Visit' (PV) to demonstrate the appropriate techniques such as gravel jetting and installation of flow deflectors. The WTT will fund the cost of labour (two-man team) and materials. Recipients will be expected to cover travel and accommodation expenses of the advisers. The use of specialist plant will be by separate negotiation if required.

Further funding could be sought from the Environment Agency Fisheries Project budget, emphasising the club's concurrence with the National Trout and Grayling Strategy's aims of habitat improvement and protection of wild brown trout stocks.

Note: Recipients of a PV must have received a WTT AV and have obtained the appropriate consents from the Environment Agency, Natural England,etc, prior to arrangements being made to undertake the PV.

Applications for all the above should be made via projects@wildtrout.org

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.

References

Harper, D.M. (1990) The ecology of a lowland sandstone river: the River Perry, Shropshire *Field Studies* **7**, 451-486. www.field-studies-council.org/fieldstudies/documents/vol7.3_198.pdf

Swales, S. (1982) Notes on the construction, installation and environmental effects of habitat improvement structures in a small lowland river in Shropshire. *Fisheries Management* **13**, 1-10.

Swales, S. & O'Hara, K. (1983) A short-term study of the effects of a habitat improvement programme on the distribution and abundance of fish stocks in a small lowland river in Shropshire. *Fisheries Management* **14**, 135-144.

Appendix 1

Environment Agency Electric Fishing Survey Data

Data courtesy of Chris Bainger, Environment Agency Fisheries Technical Specialist.

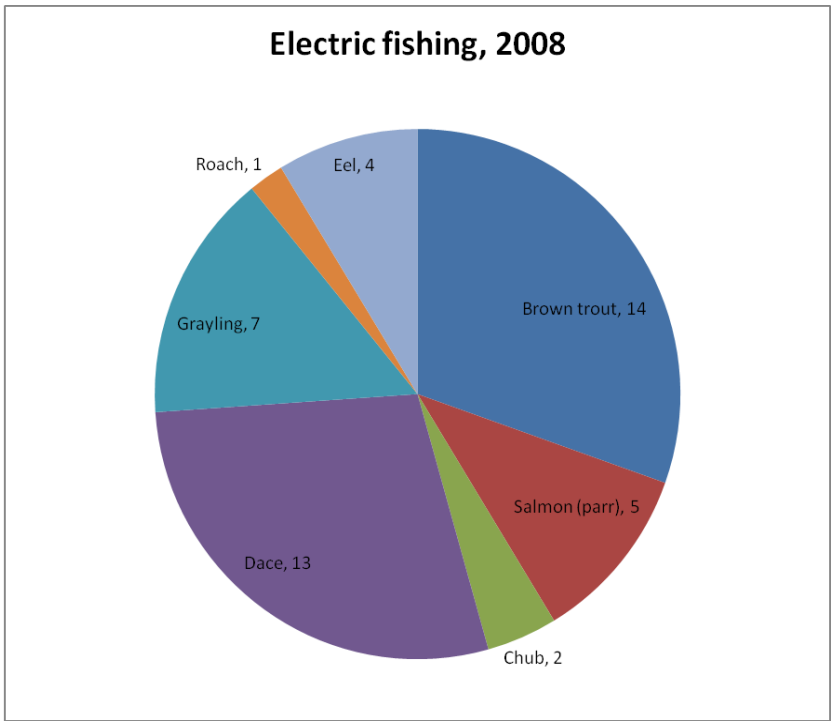

Figure 2 Numbers of fish caught, 12th May 2008, from Fitz Mill site (SJ 44405 18053). 100-m long site, 600 m^2 water surface area.

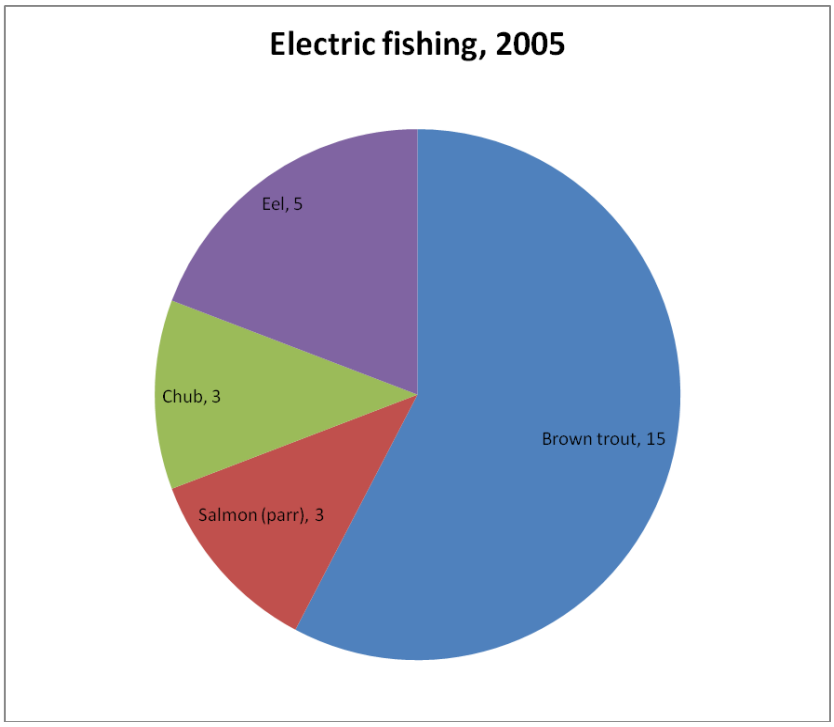

Figure 3 Numbers of fish caught, 14th June 2005, from Fitz Mill site (SJ 44405 18053). 100-m long site, 600 m^2 water surface area.

Bullhead, stone loach and minnow are also present.