



Advisory Visit

River Dane, Hug Bridge

Macclesfield Fly Fishers

2nd October, 2008



1.0 Introduction

This report is the output of a site visit undertaken by Tim Jacklin of the Wild Trout Trust on the River Dane, at Hug Bridge on the Cheshire/Derbyshire boundary on 2nd October 2008. Comments in this report are based on observations on the day of the site visit and discussions with Eric Jones, Frances Frakes, Les Walker and David Harrop of Macclesfield Flyfishers Club (MFC) and Kevin Nash and Stephen Cartledge of the Environment Agency (EA), North West Region.

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

Macclesfield Flyfishers Club has been in existence for 55 years and currently has about 90 members. The club own the fishing rights to the Hug Bridge stretch of the River Dane and it is their longest-held fishery. At the downstream limit of the fishery (SJ 9309 6360) is a United Utilities abstraction pumping station and a gauging weir (Photo 1). The upstream limit some 1.5 km upstream is at the confluence with the Shell Brook (SJ 9413 6388).

The club stock 400 brown trout of around 7 inches in length each year, in two batches during April and May. These are sourced from Dunsop Bridge trout farm, and it not certain if these are diploid (fertile) or triploid (non-breeding fish). The river is also stocked upstream of the MFC stretch.

Catch returns for the last three seasons are shown in Table 1, and show a declining number of visits to the fishery and an increasing average catch. There is no information available on the component of stocked and wild fish in the catches.



Photo 1 Gauging weir at Hug Bridge

Table 1 Recent catch returns

	No. Visits	Fish caught (no. killed)	Average fish/visit
2005	68	246 (5)	3.62
2006	39	146 (3)	3.74
2007	33	144 (2)	4.36

The EA survey a site at Hug Bridge by electric fishing every five years as part of the National Core Monitoring Programme. These surveys have recorded brown trout, bullhead, brook lamprey and the occasional small rainbow trout, probably escapees from a trout farm upstream.

The non-native signal crayfish (*Pacifastacus leniusculus*) are present, and around six or seven years ago a large mortality of this species was recorded.

The cause of the crayfish kill was investigated by the EA but could not be pinpointed.

In April 2004 a habitat improvement project was undertaken by MFC (funded by EA Fisheries), and large boulders were placed in three areas of the fishery. Tree coppicing was carried out alongside the sites where the boulders were placed. The EA carried out before and after monitoring (April 2004 and April 2005) of fish populations at a boulder placement site and a control site (Weybourne, 2006). Increases in the trout numbers were seen at both sites (more so at the control site). No further monitoring has been carried out.

A similar boulder placement was carried out on the stretch of river upstream of the MFC fishery, following a visit by the Game Conservancy Trust.

3.0 Habitat Assessment

The river was approximately 0.6 metres above base flow on the day of the visit, but the water was clear with a peaty hue. The Dane originates on Axe Edge and drains the South West Peak, an area characterised by Millstone Grits and Coal Measures formed during the Carboniferous period. This section is very much an upland river, subject to a wide variation in flows, and with a steep gradient and high energy.

The river habitat is generally very good. There is a strong pool-riffle sequence, with gravel shoals and side bars present. The banks are lined with mature trees, mostly alders, but also ash, rowan and sycamore.

In some areas the trees have been coppiced to allow more light to reach the river channel. This appears to have been done alongside the boulder placements mentioned in section 2.0. Re-growth of the coppiced stools has been strong in some areas, but limited in others. (Photos 2, 3 and 4). The restricted re-growth is probably because of damage by grazing livestock (the coppiced areas are not fenced), and the location: the poorer re-growth areas are on the north bank and shaded by tall tree growth on the south bank.

It is important to encourage re-growth of coppiced trees. If they are allowed to die then the loss of a large number of trees from the river bank could lead to excessive rates of bank erosion.



Photo 2 Coppiced trees in 2004 at the downstream boulder placement site (from Weybourne 2006)



Photo 3 2008: Good re-growth of coppiced alders at same site as Photo 2



Photo 4 Less successful re-growth of coppiced trees at the middle boulder placement site

It was not possible to see the full effects of the boulder placement during the visit because of the high water levels. MFC members feel the project has been generally successful in terms of creating localised scour of the river bed, fish holding areas and an increased diversity of flow patterns.

The furthest upstream site for boulder placement is regarded as being the least successful. Here one of the boulders has been placed too close to the

right bank and is causing bank erosion; this was evident in the high flows during the visit and is likely to lead to the loss of the tree immediately downstream (Photo 5).

There was generally a lack of large woody debris (LWD) in the river. Woody debris in rivers can provide habitat for a variety of animals. Brown trout numbers increase significantly with the presence of woody debris along the banks and in the river as it provides refuge and cover. It also offers lies for otters or perches for kingfishers. Woody debris in the river also creates pools and riffles in sections of the river that would otherwise have a dearth of aquatic habitats. It also retains leaf litter (food for 'shredding' invertebrates) and hence acts as an energy reservoir for the river section.

In a spate river such as the Dane, the presence of LWD can be fairly short-lived as it is moved on by floods. However, even ephemeral structures can be beneficial in creating bed scour, cleaning gravel for spawning and providing cover. LWD such as that shown in Photo 6 is likely to be washed out in a flood, but will have created valuable diversity in depths and flows by then. Longer lasting LWD can become established where larger trees become waterlogged and embedded in the substrate, such as shown in Photo 7.

Land use on both banks was mostly for livestock, at the time of the visit dairy and beef cattle (Photo 8). Most of the river was not fenced, although cattle access to the river was limited by the steep banks. At cattle drinking areas there was some poaching of the banks (Photo 9), although this was not particularly serious. Generally the banks were in good condition and well vegetated. One field on the LHB was used as a quad bike circuit, and whilst there was some bare earth tracks, there did not appear to be any run off to the river from these.

In some areas the bank was scalloped between trees (Photo 10). This is due to the shading out by trees of low-growing marginal plants the roots of which stabilise banks, leading to gradual bank erosion between the root boles of the trees; it can also be caused by the hole left in the bank when a tree falls into the river. This scalloping can lead to further losses of trees as erosion occurs behind the root bole of existing trees.



Photo 5 Boulder placed too close to right bank, causing bank erosion



Photo 6 Large woody debris - excellent wild trout habitat



Photo 7 More stable large woody debris



Photo 8 Land use - right bank



Photo 9 Bank poaching caused by cattle



Photo 10 Scalping of the bank between trees

There are two tributaries entering this reach of the Dane; the Shell Brook at the upstream limit of the MFC fishery, and a small un-named stream on the RHB. These are likely to be used by trout for spawning and nursery areas, and as such it is important to ensure trout have free access into the brooks from the main river. The small un-named tributary had a tractor crossing about 150 metres from the river consisting of a concrete pipe culvert; this had become perched on the downstream side making it difficult for further upstream access for fish (Photo 11).



Photo 11 Culvert pipe on small tributary perched above downstream water level making upstream fish access difficult

On the upstream section of the fishery the right bank was steep and wooded and the left bank was lower and mostly fenced to exclude livestock. There was generally a generous margin between the fence and the river, and some excellent examples of vegetated side bars and berms alongside the river (Photo 12).

A large part of the upstream section of the fishery consisted of a fast, shallow, straight reach which was heavily shaded (Photo 13). The south



Photo 12 Fenced LHB on upstream section of the fishery



Photo 13 Heavily shaded straight reach



Photo 14 Previously coppiced hazel

bank has a lot of sycamore and previously coppiced hazel (Photo 14), on a low but steep bank with the fence line close to the river.

4.0 Recommendations

Overall this part of the River Dane has excellent habitat for wild trout. The river is geomorphologically active and has a very good pool and riffle sequence. LWD is lacking and should be retained to enhance the diversity of flows, habitat and sorting of river bed sediments. Land use pressures appear generally light with the upper section of the river better protected from livestock than the lower.

· The club should 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 go to 4, if no go to 5.
4. **Retain the woody debris in the river.**
5. **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.

- LWD could be introduced to the river in selected sections. For example 'tree kickers' could be used to protect the areas of scalloped bank between trees (Figure 1). Tree kickers have recently been used successfully on the River Goyt near New Mills (Photo 15).



Photo 15 Tree kicker anchored to bankside tree with cable, protecting scalloped bank

The tree kickers on the Goyt have promoted the deposition of fine sediment in the margins of the river. This is valuable habitat for the ammocoete stage of brook lamprey, a species of conservation importance.

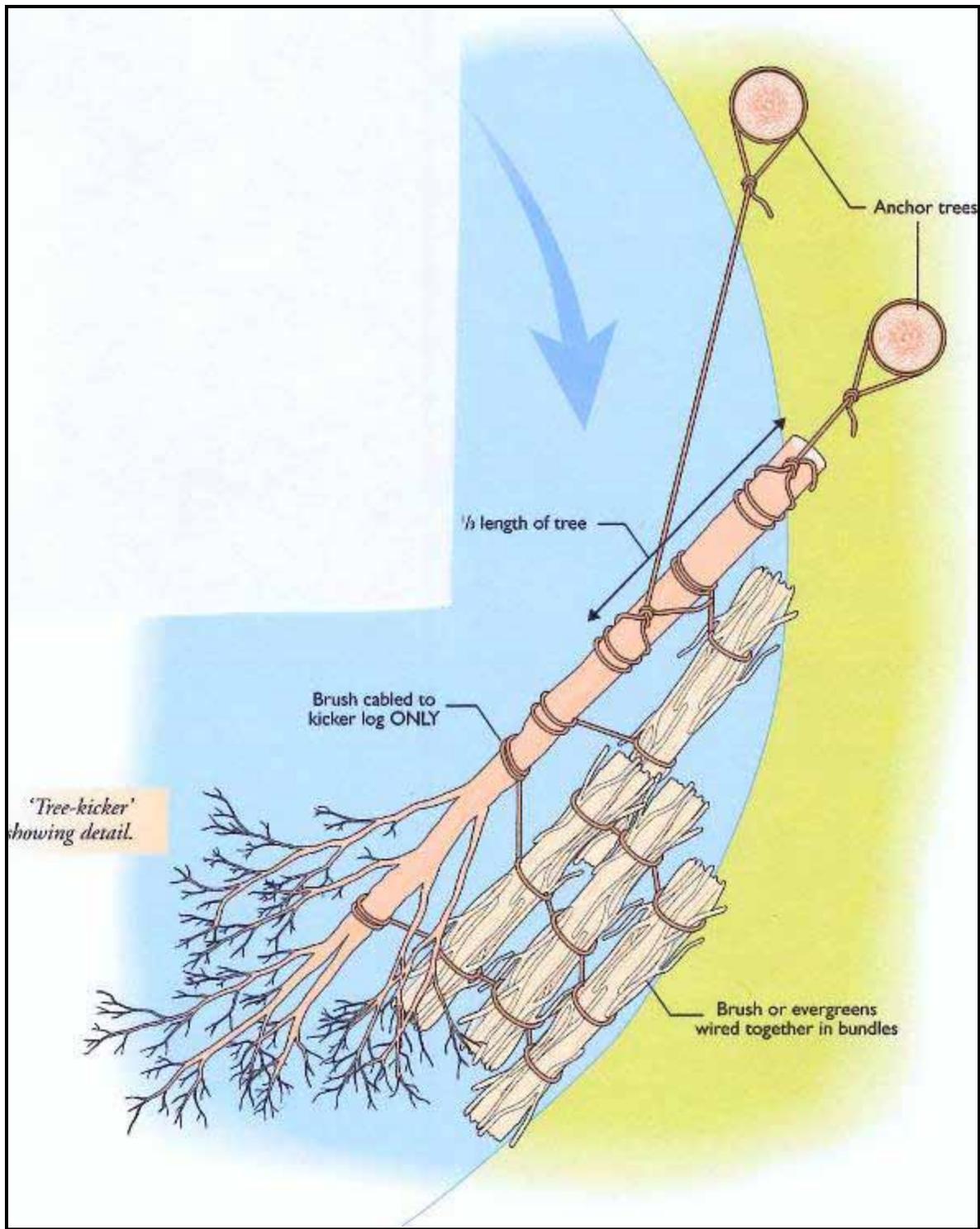


Figure 1 Example of 'tree kicker' erosion protection for high energy streams

- Further tree coppicing could be carried out in heavily shaded areas to increase light penetration to the river channel and to provide a source of LWD for introduction to the river channel (as tree kickers). It is recommended that selected trees are coppiced on a 7 to 10 year rotation. The aim should be to produce a mix of trees at different stages of maturity, and the trees selected for coppicing should be well spaced, rather than in blocks as in Photo 2. A mix of light and shade at a ratio of 40% to 60% is ideal.

The south bank of the river would be the most advantageous location for tree coppicing to promote increased light penetration. For example the long straight reach at the upstream end of the fishery would benefit from a thinning of trees on the south bank and introduction of LWD to this section. The numerous hazel trees in this area could be used to create brushwood bundles for the tree kickers mentioned previously.

It is important that a suitably qualified person (e.g. from EA Biodiversity team) is consulted prior to commencing any tree work to ascertain that no protected species such as bats would be harmed. Tree works should not be carried out between March and September to protect nesting birds.

Coppiced trees will require fencing to protect from grazing livestock to allow re-growth from the coppiced stools.

- The club should take part in the anglers' invertebrate monitoring initiative instigated by the Riverfly Partnership. The unexplained deaths of crayfish six years ago could have been caused by sheep dip (similar incidents were confirmed as such in the adjacent Dove catchment around the same time). Regular invertebrate samples provide a quick water quality "health check" and can provide an early warning of pollution problems. 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

- The club should check that fish have free access to the Shell Brook for spawning. If there are any obstacles similar to that on the smaller tributary mentioned above, the EA Fisheries department will be able to advise on potential solutions.

- It is recommended that the Club uses triploid brown trout stock fish to avoid interbreeding between wild trout and farmed fish. In addition the Club should review its catch returns in relation to stocking levels, and consider reducing the number of fish stocked. Other river trout fisheries have found that as catch-and-release has become more widely practised, they have been able to reduce their stocking levels without reducing catch rates. In many cases the rod averages have increased, and greater numbers of wild fish have contributed to catches. This is probably because of increased numbers of wild fish in response to reduced competition and predation between stocked and wild fish. The Environment Agency's National Trout and Grayling Strategy has recently introduced a policy that will make it compulsory to use triploid (non-breeding) brown trout when stocking rivers (www.environment-agency.gov.uk/subjects/fish/165773/1791055/1800027/). 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.

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 in the following ways:

- Advice and support in formulating a worked-up project proposal and assistance with the preparation of Environment Agency Land Drainage consent applications.
- Works could be kick-started with the assistance of a WTT 'Practical Visit' (PV). The WTT will fund the cost of labour (two-man team) and materials. Recipient organisations will be expected to cover travel and accommodation expenses of the advisors. The use of specialist plant will be by separate negotiation.

Wet-work advisors can demonstrate one or more of the following techniques that are appropriate to the site such as

- Tree Planting
- Fencing (Installation & Repair)
- Flow Deflectors
- Introduction / Management of Woody Debris

Note: Recipients of the programme 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.

- Seed-corn funding to help kick-start the project. This can be in the form of an AV bursary (usually £500 - £1500) to help lever additional funding) and/or via the Rods for Conservation scheme. The latter is where the Trust can provide a prestige rod (Sage or Hardy) at cost price for the club to raffle to raise funds for the project.

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.

7.0 Acknowledgements

This Wild Trout Trust advisory visit was made possible through sponsorship provided by the Environment Agency, the aim of the which is to provide professional advice and project support for fishing clubs, riparian owners and community groups wishing to undertake wild trout conservation projects.

8.0 References

Weybourne, Emma (2006) The effects of habitat enhancement work on the River Dane at Hug Bridge 2005. Report by Environment Agency, North West Region (South Area).