



**HABITAT ADVISORY VISIT TO THE RIVER
TROTHY, MONMOUTH, WALES**

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MONMOUTH AND DISTRICT ANGLING
ASSOCIATION**

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1.0 Introduction

This report is the output of a site visit undertaken by Vaughan Lewis, Windrush AEC Ltd to the River Trothy, near Monmouth, Wales on behalf of Monmouth and District Angling Association on 22 March 2006. The club had some 170 members, able to fish over a distance of some 10km of river.

Comments in the report are based on observations on the day of the site visit, and discussions with members of the club. Throughout the report, normal convention is followed with respect to bank identification i.e. banks are designated Left Bank (LB) or Right Bank (RB) whilst looking downstream.

2.0 Habitat Assessment

The River Trothy rises in Glen Trothy, three miles east of Llanvihangel Church, flowing in a generally south-south easterly direction before entering the River Wye a mile below Troy House. The surface geology of the catchment was dominated by very friable red sandstone.

The lower reach of the club's fishery was located either side of Jingle Bridge. Downstream of the bridge the river was very heavily incised, with the water level some 4m-5m below the level of the surrounding land. Although none of the club members could remember any dredging during the past 40 years, this incision was indicative of some past channel modification. Members remarked that the channel had become increasingly deepened during the past 20-30 years. There were sections of gravel bed riffle and shallow glide present, providing potentially good habitat for spawning and juvenile salmonids. Hatches of river flies remained strong, with mayfly *Ephemera danica* abundant in some years. The presence of dipper *Cinclus cinclus* reinforced this observation.

The channel was heavily shaded by riparian trees, with alder *Alnus glutinosa* and hazel *Corylus avellana* the dominant species. The multi-stemmed nature of the alders was indicative of past coppicing, probably some 25-30 years ago. The shade cast by the trees was suppressing the growth of bankside vegetation, increasing still further the risk of damaging erosion. There was some Large Woody Debris (LWD) in the channel, although the Environment Agency (EA) generally removed this during routine management visits. Additional instream cover was provided by undercut banks and tree root systems.

Land use downstream of the bridge was semi-improved pasture, with some overgrazing visible. Despite this, there were some significant stands of bramble *Rubus fruticosus* that had developed in places, reducing access to the river for anglers. This was a key issue in this reach, with the river banks too high for fishing from and the river tunnelled by trees and too deep for safe wading.



River Trothy downstream of Jingle Bridge

Adjacent to St.Dingats church, the river was not so deeply incised (<1.5m). The banks were again heavily tree lined with the dominant alder, ash *Fraxinus excelsior* and willow *Salix* Spp. trees casting heavy shade. The multi-stemmed alder trees appeared to be some 20-30 years old. This estimate accorded with the landowner's observation that a major clearance of the river was undertaken by the then Welsh Water Authority around this time.

The EA had apparently continued the policy of routine removal of LWD from the river. This had not been helpful to the development of a more natural geomorphological regime, and had prevented the establishment of valuable debris rafts within the river. Instream habitat within the channel was good with sections of shallow glide and riffle interspersed with deeper runs and pools.

At Lower Llanthrothy Farm, the most important impact on the river was the overgrazing of the floodplain fields by sheep. There was little or no coarse vegetation remaining on the banks, with the result that the rate of erosion was considerably higher than would be expected, with large sections of the bank being lost annually. The presence of alder trees and the shade they cast was exacerbating this problem. Many of the alders were infected with the fungal disease *Phytophthora*, resulting in the death of some of them.



Sheep grazed, eroded banks at Lower Llantrothy

There were a number of significant LWD rafts in the river, providing excellent habitat for a range of species, and increasing heterogeneity of the local habitat.



Large woody debris raft at Lower Llantrothy

There were no sections of gravel bedded riffles in this reach, with the good catches of wild trout taken here presumably recruiting elsewhere in the river. Access to the river here was slightly easier than at some of the other sections of the club fishery on the Trothy.

The landowner expressed interest in considering methods to reduce the erosion, as he too was concerned about the state of the river and its banks. He was also keen that the LWD rafts should remain in the river, as he recognised the value of these features.

3.0 Fish stocks

The river has not been stocked for more than 15 years, with all brown trout caught effectively wild. Club members reported good catches of trout, particularly in the early season when access was relatively easy. There were also considerable stocks of dace *Leuciscus leuciscus* and chub *Leuciscus cephalus* present in the river.

4.0 Recommendations.

- Erosion is a natural process. It is responsible for supplying coarse sediment to the river, which is essential for spawning salmonids. It also results in the creation of instream habitat diversity for all lifestages of fish, invertebrates and aquatic plants. However, the erosion processes at work on the River Trothy are extreme, with the channel having been substantially affected by man's activities. Without a good historic record of management of the river, it is difficult to pinpoint exactly what works have been undertaken that have resulted in the deep incision of the channel at Jingle Bridge. It is likely that some dredging of the channel has occurred, perhaps during the construction of the railway or the nearby A40 (the straightened channel running alongside this road provides a clue). Whatever the cause, the incision of the channel in this location has resulted in a lack of hydrological connectivity with the flood plain during low/moderate return flood events. As a consequence, the energy of the moderate flood events is constrained within the channel, resulting in vertical and lateral scour. This cause increased incision of the bed, fuelling this negative feedback loop. It is very difficult to see how this process can be reversed in this location.

Coppicing of some bankside trees would allow more light to fall on the banks, promoting the growth of erosion resistant vegetation, whilst allowing Large Woody Debris (LWD) to accumulate in the channel (see below) would allow water levels to rise locally. However, these are small-scale changes that cannot be expected to remediate what is very significant damage to the instream habitat of the river. If funds were available, it would arguably be easier and more effective to cut a new channel across the flood plain.

- The impact of grazing sheep on the Lower Llantrothy reach had resulted in a dramatic and damaging increase in the rate of bank erosion, largely due to a loss of valuable binding vegetation. As a consequence, the banks were continually eroding, forming a heavy burden of fine sediment on the bed.

The solution to this problem is straightforward. The number of sheep having access to the river banks must be significantly reduced, either by an overall reduction in numbers of animals in the flood meadows or by the erection of fencing to keep them away from the river bank.

Fencing is likely to be problematical as large flood events may sweep away sections of any new fence line. Erection of fencing parallel to the river will reduce the impact of flood damage. This issue has been addressed in details on Cumbrian rivers with similarly fierce floods. For instance, in some reaches of the River Derwent, sections of 'sacrificial' fence are provided in areas known to be vulnerable to damage. Short sections of fencing are thus regularly lost and replaced, rather than having to replace a whole length of fence. In addition, any fencing erected would need to be 40m-50m from the river to enable the growth of protective vegetation before erosion threatened the fence line. It may be possible to fence off meander loops and provide a degree of

protection to banks within these areas. Small numbers of sheep could then be allowed to lightly graze these enclosures, maintaining a dense sward of rough grass but preventing the development of dense scrub.

- Under the new farm payment schemes, an element of cross-compliance is required by farming interests. Part of the cross-compliance includes the requirement for a soil management self-assessment form to be submitted to the Welsh Assembly by 28 February 2005. The form should contain a time-scale by which soil conservation issues will be addressed. The guidelines also specifically state that 'stock should not be allowed unrestricted access to watercourses where this causes erosion'.

In conjunction with the farming interests of the worst affected reaches, the club should work with the Welsh Assembly's Department for the Environment Planning and the Countryside, in order to develop an acceptable soil management strategy for the floodplain fields. There appeared to be a real interest amongst the major landowners to address this issue and find a solution that protected the river from damaging erosion, whilst preserving agricultural income.

Details of the new Single Farm payment scheme for Wales and associated cross-compliance requirements can be found on

http://www.countryside.wales.gov.uk/fe_news/news_details.asp?newsid=66.

The Environment Agency should be encouraged to become engaged in any dialogue with farming interests and the Welsh Assembly regarding the erosion problem. It is likely that the Agency has a dedicated agricultural officer on its staff who may be able to provide specialist input.

- It must be appreciated that removal of grazing pressure, either by a reduction in the number of sheep or by fencing will improve instream and riparian habitat. However, the increased rate of bankside vegetation growth will create an access issue for the club. Members are likely to find it hard to get to the river to fish, due to the stands of nettle, brambles and other bankside plants. It may be necessary for some localised path cutting to be undertaken if access is to be ensured.
- One of the most significant impacts on the fishery was the heavy shade cast in places by riparian trees. This shade was restricting the growth of marginal vegetation, with associated damaging impacts on the rate of erosion, the provision of marginal cover for fry, and water flow velocity. In order to address overshading, the establishment of a regime of limited, rotational coppicing would be of great benefit. Increasing light penetration into presently overshadowed river sections would be of benefit to instream vegetation and valuable fringing marginal vegetation. The conservation value of the existing trees should not be under-estimated and great care should be exercised in the selection of trees to be cut. A felling licence will be required from the Forestry Authority.
- If it proves possible to prevent unrestricted access of stock to the river, then tree planting offers the potential for speeding up restoration of the eroded river. Sacrificial bands of fast growing trees such as alder *Alnus glutinosa* and goat willow *Salix caprea* can be used to slow down erosion rates across the floodplain. The Welsh woodland charity Coed Cymru, based at Tregynon, has undertaken studies in conjunction with research institutions of the benefits of floodplain tree planting. They

also have considerable experience in the marketing of small diameter timber in order to maximise its financial value. Contact their director David Jenkins on 01686 650777 or <http://www.coedcymru.org.uk/staff.htm> for further information.

- The club and landowners should adopt a policy of retaining LWD where possible. The benefits for retaining it are clearly laid out in the recent Environment Agency R&D document, “Large Woody Debris in British Headwater Rivers”. Key conclusions of the report include:
 - An increase in both mean flow depth and velocity and variability of both parameters.
 - The development of high physical habitat diversity both in-channel and in the floodplain. Removal of LWD reduces both habitat quality and availability for juvenile and adult brown trout.
 - Although active LWD dams may impair upstream migration of fish at low flows, they rarely do so at high flows.
 - LWD have significant benefits to the control of run-off at the catchment scale.
 - River and riparian management has important effects on the distribution and character of dead wood accumulation within the river system.

The report also provides recommendations for the management of LWD, the most important of which is “although there are certain situations that may require wood removal to eliminate stream blockage, the wisest management is no management”.

Building on this simple truism, it is recommended that before any future work to remove LWD from river channels is undertaken, the wider implications of the proposal on the whole river system are considered, rather than just the potential (in many cases unproven) benefits to salmonid populations. In addition, the impact of planned riparian tree work on the supply of LWD to the river should be considered. In some circumstances, it may be beneficial to allow trees to fall into the channel. Provided that the tree can be stabilised in the river channel, there appeared to be little risk of increased local flooding. Stable LWD of this sort is of particular long term value, allowing the build up of debris rafts and associated beneficial macroinvertebrates that are vital components of the energy cycle of river systems. There is no problem with continued cutting of small overhanging branches for angling access.

- It is important that the EA is made aware of any adopted policy to retain LWD in the channel, both in order to prevent its removal during routine management operations undertaken by the Agency and to gain assurance that this policy does not compromise the Agency’s flood management of the river. The Agency should be asked to produce a reasoned justification for any removal of LWD from the river. Current EA national flood defence policy is to promote the attenuation of peak flood events on low value agricultural land. Retention of LWD would assist this process.
- There have apparently been considerable changes in land use within the catchment over the past 20 years, with a big increase in arable cropping particularly of maize. Cultivation methods for this crop are notorious for causing ‘capping’ of soft soils, encouraging increased rates of surface water run-off and erosion of soil from fields. In combination with increasing amounts of intensive dairy farming and climate change, this is likely to have resulted in a peakier hydrograph (more intense spates,

longer periods of low flows), and increased inputs of damaging fine sediment into the river. These changes can only be addressed by control of agricultural operations on a catchment scale, probably under the Tir Gofal scheme or via the cross compliance measures required under the Single Farm payment.

- Seed corn funding may be obtainable for implementing some of the recommendations of this report. This money could be used to generate more income from a partnership project with the EA, the Welsh Assembly, and landowners.
- Any works to the bed or banks within 8m of a river require the previous written consent of the Environment Agency. In addition, the Agency's consent is required under Section 30 of the Salmon and Freshwater Fisheries Act 1975, for the introduction of any fish or eggs to any inland water.
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