Advisory Visit

River Wye, Buxton Flyfishers Club, Derbyshire

17th 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 Wye near Buxton, Derbyshire on 17th March 2009. Comments in this report are based on observations on the day of the site visit and discussions with Paul Richardson of Buxton Flyfishers Club (BFFC), and David Percival, riverkeeper for Cressbrook & Litton Flyfishers Club (CLFFC) which controls the water immediately downstream of this reach.

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

BFFC control the fishing on the River Wye between the footbridge at Blackwell Cottages (downstream limit, National Grid Reference SK 112727), and the bridge at the Devonshire Arms (Silverdale Plant Ltd.) (NGR SK 081724), a length of approximately 4 km. A schematic diagram of the river is shown in Figure 1. The water is owned by the Chatsworth Estate and leased to BFFC.

The club has 24 members, and stocks 250 12-14" brown trout (diploid) per annum into the lower third of the fishery (downstream of Topley Pike car park). No stocking has taken place upstream of this point, nor any rainbow trout been introduced, for several years. The fishery contains excellent self-sustaining populations of brown and rainbow trout throughout, although it is felt that there is a predominance of small fish. The majority of BFFC members practise catch and release, and few fish are killed.

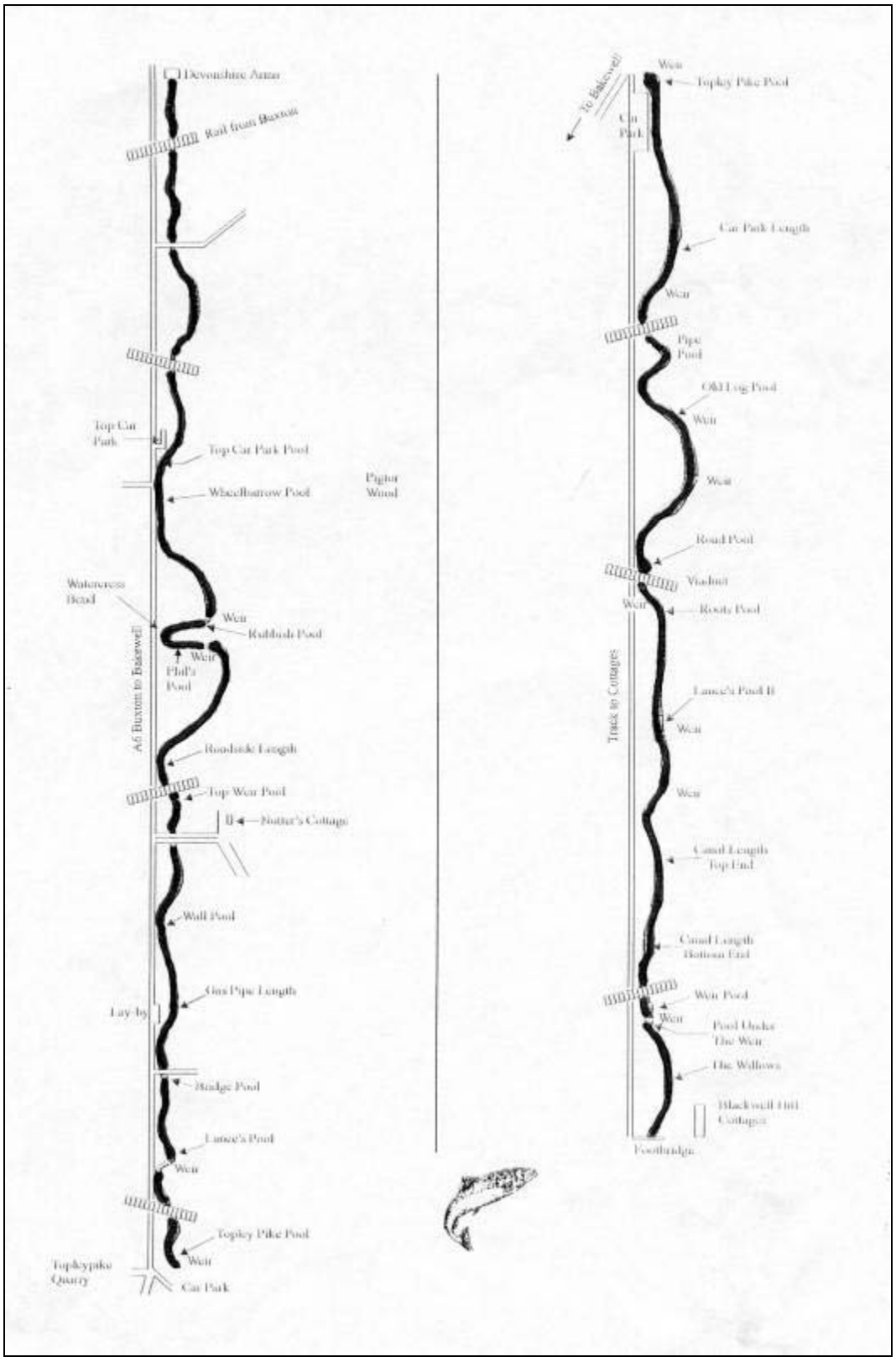

Figure 1 Schematic diagram of Buxton Flyfishers Club water on the Wye.

The Wye runs off Carboniferous limestone, and has a distinctive limestone stream character: clear water, plentiful water crowfoot (*Ranunculus* sp.), and a good base flow (being fed by groundwater from numerous springs). This reach of the Wye is located downstream of Buxton, a town of approximately 21,000 people, and receives the effluent from Buxton sewage treatment works (STW). In years gone by, sewage from Buxton caused considerable pollution in the river, as evidenced by Gallichan (1905) who described it thus:

The Wye come down from the moors, and at one time there were fish in it close to the town. But with the growth of Buxton the town sewage has polluted the river for nearly five miles down. It is lamentable that such a lovely stream should be the receptacle for poison. The beauty of the scenery, when one is well away from the town, is unimpaired, and the Wye flows merrily through Ashwood Dale, Wye Dale, and Chee Dale. But the fish have taken leave of its tainted water, and several miles of fine fishing have been lost to the angler.

Fish of 2 pounds were common, and good baskets could be made near to the town. This is all past history. The Wye has been prostituted to the service of a drain. In the Report of the Annual Meeting of the Trent Conservators for 1903 it is stated: "Buxton: Additional works completed; can't say whether they will be satisfactory."

Walter M Gallichan, ***Fishing in Derbyshire and Around*** (1905), Chapter VII The Upper Wye.

Improvements to the STW, especially the upgrade in 2004 by Severn Trent Water plc, has much improved the water quality in the river. This has been reflected in the invertebrate community in the river, demonstrated by EA sampling results, the successful re-introduction of Mayfly (*Ephemera danica*) by David Percival and associates, and the natural re-colonisation of pollution-sensitive species like stoneflies (Plectoptera). Litter originating from Buxton is an ongoing problem and both BFFC and CLFFC expend considerable effort each year removing large quantities from the river.

The river flows through a steep-sided, wooded valley containing largely ash, wych elm, hazel and beech. Parts of the river are located within or close to Sites of Special Scientific Interest (SSSI) including Wye Valley SSSI (www.english-nature.org.uk/citation/citation_photo/2000186.pdf), and Topley Pike and Deepdale SSSI (www.english-nature.org.uk/citation/citation_photo/1000145.pdf). The features of interest in these SSSIs are largely terrestrial vegetation associated with the

carboniferous limestone geology. The sites also form part of the Peak District Dales Special Area of Conservation (SAC) (www.jncc.gov.uk/protectedsites/sacselection/sac.asp?eucode=uk0019859) (Figure 2).

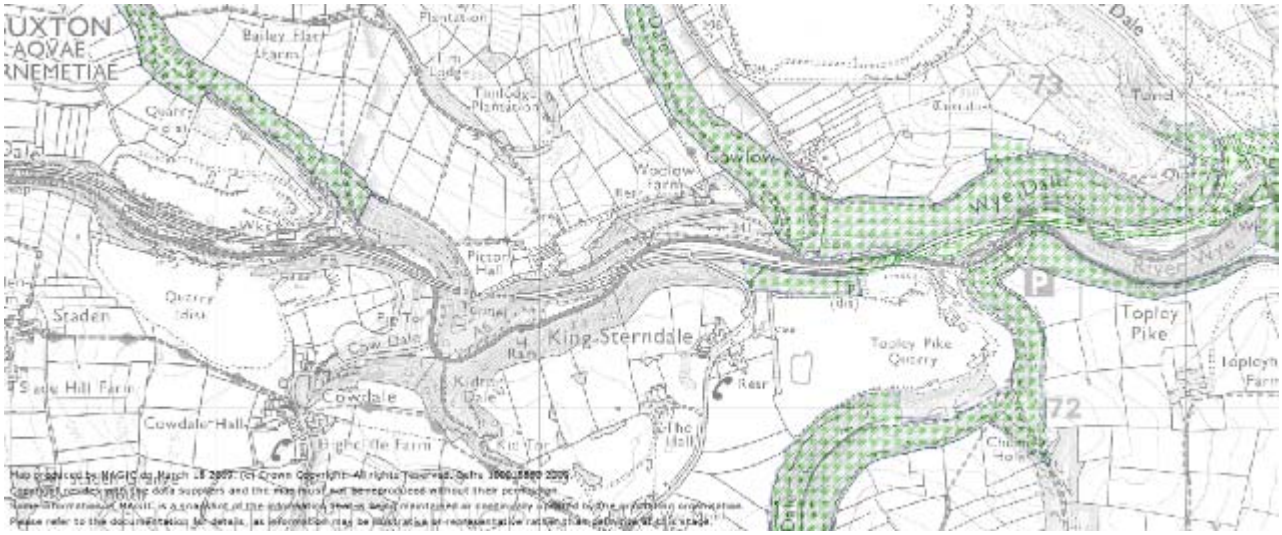

Figure 2 Green shaded areas are SSSI, blue hatched area is SAC.

3.0 Habitat Assessment

This reach of river has a steep gradient, a bed comprised largely of gravels and cobbles interspersed with some boulders, plenty of shallow broken runs, plentiful water crowfoot, and a good base flow (Photos 1 and 2). This provides excellent spawning and juvenile habitat and leads to very good recruitment of trout.

Many sections of river are long and straight (for example in areas alongside the A6 road), and stone revetment at the toe of the bank is widespread throughout the fishery; this indicates the river was straightened in the past, probably because of road or railway engineering works (Photos 3 and 4). This has lead to long, shallow, high gradient stretches, with little depth variation; these provide habitat which is suitable for spawning and trout parr, but they lack deeper habitat which suits larger trout.

Photo 1 Broken runs of water, gravel and cobble substrate, and woody debris – excellent habitat

Photo 2 Water crowfoot (*Ranunculus* sp.)

Photo 3 Straight, shallow sections of river are common

Photo 4 Stone revetment is present along the toe of the bank for long lengths of the river

In contrast to the straight sections, there are a few areas where there is less stone revetment and sinuosity is present in the channel; here the natural processes of erosion (on the outside of bends) and deposition (inside of bends) is occurring creating what are known as lateral scour pools. This natural variation in depths provides areas of deep water which is good habitat for larger, adult fish. A good example is Phil's Pool (Photo 5)

BFFC have recognised that deeper water habitat is limited and built some low stone weirs to impound water and create depth (Photo 6). The club used to build up the height of these every spring to retain water depths. The weirs were usually reduced in height by winter floods, so BFFC decided not to continue with annual repairs as it felt the effort outweighed the benefit.

The construction of weirs, even low structures such as these, is generally not recommended. Raising upstream water levels leads to a corresponding reduction in water velocities, often causing the upstream section to accumulate finer sediments and leading to the section becoming shallower over time as the river bed re-grades itself (this is evident above some existing structures on the Wye). The reduction in water velocities and changes to river bed composition will also see changes in the in-stream plant communities, with the loss of flow-loving species like water crowfoot (*Ranunculus* sp.) and water moss (*Fontinalis antipyretica*).

There are relatively few impounded sections on this fishery - two or three 'canal' stretches are present above impoundments, including the significant mill weir at Blackwell Cottages. Some of these areas provide easy access for less able club members, and do hold some larger fish (including stock fish). These areas could be improved further by managing bankside trees and shrubs (willows) to create some low cover over the water (Photos 7 and 8).

Low cover is very important for both adult and juvenile trout – overhanging and submerged boughs, marginal vegetation, tree roots, etc. significantly increase the 'carrying capacity' of a river; that is it will hold more fish for a given length or area. This applies throughout the fishery, not just on the impounded sections. In some areas the club have cut back willows to improve access for angling; this has been over zealous and removed valuable marginal cover, reducing the potential for these areas to hold fish. An example of this is the area known as "The Willows" just upstream of Blackwell cottages (Photos 9 and 10).

Photo 5 "Phil's Pool" – good adult trout habitat: deep water created by lateral scour on a bend

Photo 6 Low stone weir

Photo 7 Good, dense, overhanging low cover on the far bank of the "Canal Length"

Photo 8 Example of an area where bankside willows could be laid, rather than cut back, to create marginal cover comparable to Photo 7, i.e. extend the effect created by this tree.

Photo 9 "The Willows" near Blackwell Cottages where overhanging trees have been cut back for angling access. Leaving a strip of cover in the margins is important; the low cover here is more important than higher branches.

Photo 10 (Downstream of Photo 9) The exposed margin following willow clearance will no longer hold fish.

An alternative to weirs for creating depth and adult habitat is using in-river structures such as flow deflectors, groynes and large woody debris (LWD) to concentrate flows and create localised scour of the river bed; another option is to encourage meandering of the river to create lateral scour pools as described above. The latter option will be constrained by the adjacent land use in many sections (e.g. alongside the A6), although there are some areas where the river has cut behind stone revetments and has begun this process; this could be encouraged where appropriate. (Photo 11).

Figure 3 shows the effects of instream structures on flow patterns and scour (wood is illustrated, but the same principles apply to stone structures). Generally upstream pointing structures are recommended to concentrate scour on the river bed, rather than on the banks as occurs with downstream deflectors. However, the latter may be appropriate if the aim is to increase meandering of the river channel.

There appears to be a policy of removal of large woody debris (LWD) which falls into the channel. The Environment Agency has removed large trees in the past, and smaller items have been removed by the club. 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 non-native, invasive plant species Himalayan balsam (*Impatiens glandulifera*) and Japanese knotweed (*Fallopia japonica*) are known to be present on this section of the River Wye. The main issue with both of these invasive species is their rapid rate of spread and the physical damage that they cause to river systems. Japanese Knotweed causes problems during times of spate as the stems and rhizomes block flows and impede drainage. Himalayan balsam blankets river banks but provides no soil retention over winter leading to erosion problems. CLFFC riverkeepers have expended considerable effort tracing Himalayan balsam upstream and attempting to eradicate it.

Photo 11 The river has got behind stone bank revetment in some areas. This material could be re-used to create groynes and deflectors to promote depth variation.

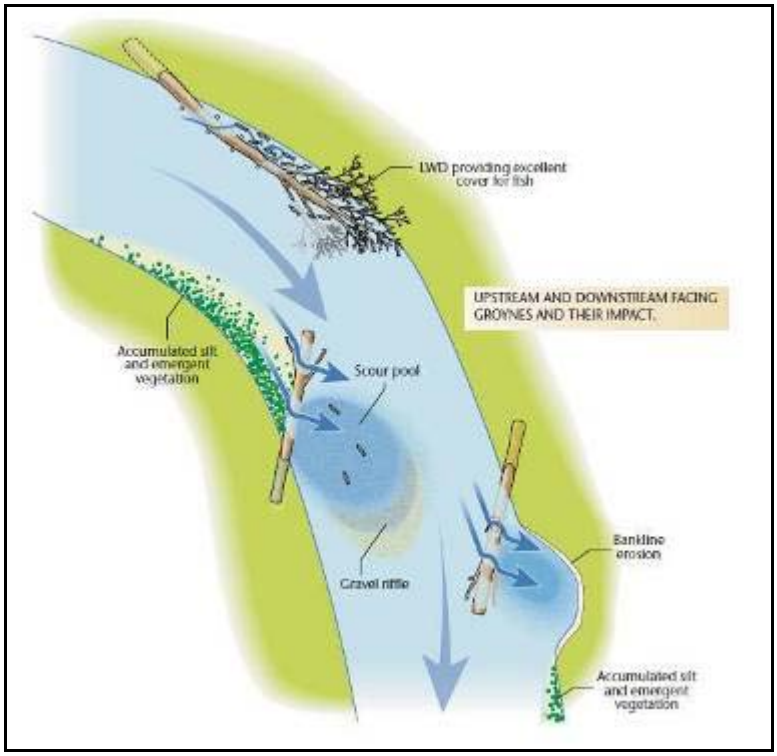

Figure 3

The non-native signal crayfish (*Pacifastacus leniusculus*) are known to be present in the River Wye at the upstream end of the BFFC water. Their presence and spread has been monitored by Stephen Moores, CLFFC riverkeeper. Their presence is undesirable as they are a threat to the native white-clawed crayfish through competition and carrying disease (crayfish plague); however, there are no known means of eradicating this species and no evidence it has a detrimental impact upon trout stocks. Trapping tends to be selective towards larger individuals reducing the self-regulating pressures (cannibal predation) on the population, leading to increased numbers of smaller individuals.

4.0 Conclusion

The River Wye generally has very good trout habitat, especially for spawning and juvenile life stages. The straightened nature of the channel tends to limit the availability of deeper water which favours larger adult trout. This can be improved by promoting the formation of deeper areas through careful management (favouring retention) of LWD or deliberate introduction of structures, and by encouraging the formation of low cover over the water.

5.0 Recommendations

- 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 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.

- Consider using large tree trunks or branches that could be fixed into the areas where the channel has been straightened to promote some local pool habitats.

- Retain some refuge areas where fish can hold up without necessarily being available to anglers.

- When trimming riverside willows for angling access leave about 20% of the channel with low cover in the margins. Mimic hedge laying techniques to create a border of willow alongside the river, rather than coppicing the willow to ground level (Photo12). CLFFC keepers have carried out such works on their waters and it would be worth visiting to see an example.

Photo 12 Willows laid along the bank on CLFFC waters.

- 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. Stephen Moores (Riverkeeper with CLFFC) has been carrying out sampling further downstream and would be a good source of advice and guidance. Suitable nets for sampling macroinvertebrates can be obtained from Alana Ecology www.alanaecology.com Tel: 01588 630173

- Take steps to control Himalayan balsam and Japanese knotweed, in conjunction with other fishery interests on the Wye (CLFFC). 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 or cutting 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.

- The club should consider an early switch to using non-breeding (triploid) brown trout as their 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.

Important: 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.

Operations which could affect the status of a SSSI or SAC also require prior written approval from Natural England.

6.0 Making it Happen

This report makes a series of recommendations that will improve both the biodiversity and status of the wild trout in this reach of the Wye. The WTT can provide further assistance to implement the recommendations, including:

- Assistance with preparing a worked–up project proposal and Land Drainage consent application
- Support at pre-application meetings with the relevant departments of the EA.
- Seed-corn funding to help kick-start the project, in the form of an AV bursary (usually £500 - £1500).
- Physical works could be kick-started with the assistance of a WTT 'Practical Visit' (PV) to demonstrate the appropriate techniques to club

volunteers. The WTT will fund the cost of labour (two-man team) and materials. Recipient clubs will be expected to cover travel and accommodation expenses of the advisers. The use of specialist plant will be by separate negotiation.

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

7.0 Acknowledgement

The WTT would like to thank the Environment Agency for providing the support that made this visit possible.

8.0 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.