



Advisory Visit

River Hamps, on behalf of Leek & District Fly Fishing Association

12th July, 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 Hamps, Staffordshire on 12th July 2008. Comments in this report are based on observations on the day of the site visit; discussions with Malcolm Cunningham, Tony Locker and Graham Stevens of the Leek & District Fly Fishing Association (www.ladffa.com); and the author's experience of the water as a member of LADFFA of 12 years.

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.

The River Hamps rises in North Staffordshire near Mixon (east of Leek) in the South West Peak area (www.countryside.gov.uk/lar/landscape/cc/east_midlands/south_west_peak.asp), and flows south east and into the White Peak area near Winkhill. At Waterhouses the river corridor turns north, and the change in geology from grit to limestone creates sinkholes; here the river becomes seasonal, flowing underground during dry weather and reappearing during wet weather to follow its course down to join the River Manifold.

Land use in the majority of the Hamps catchment is farming for livestock (sheep and beef) and small intensive dairy units. The river has a history of water quality problems of agricultural origin, including acute deoxygenation from spills of slurry and silage, pesticide pollution from sheep dip, and organic enrichment (eutrophication) from diffuse sources (slurry spreading). The catchment is included in a Catchment Sensitive Farming (www.defra.gov.uk/farm/environment/water/csf/index.htm) priority catchment (Peak District Dales) which is addressing these issues.

2.0 Fishery Overview

LADFFA's fishery is located between Winkhill and Waterhouses near the boundary between the South West Peak and White Peak landscape character areas. The fishery is just outside the boundary of the Peak District National Park. LADFFA own the fishing rights to the majority of the river upstream of the field boundary (SK 06672 50526) on the left bank upstream of Dukes

Lane Bridge (SK 06817 50582); downstream of this point LDFFA rent the fishing down to Steps Cottage. The fishery is approximately 3 km long.

The river contains wild brown trout and grayling and is not stocked. The river was extensively restocked with farmed brown trout in the mid-1980s following a severe fish kill caused by a slurry spill. A study into trout genetics in the wider Dove catchment by the EA in the late 1990s found the Hamps to have one of the highest levels of introgression of farmed fish genes of the 26 sites sampled. A small number of trout fry originating from wild brood stock from the River Lathkill were introduced by LDFFA about five years ago.

The river contains the non-native signal crayfish (*Pacifastacus leniusculus*). This appeared in the river in the early 1980s, probably having escaped from a pool near the head of the catchment. A fisheries survey at Ford in 1984 by the then Severn Trent Water Authority recorded large numbers of dead native crayfish (*Austropotamobius pallipes*); these were most likely affected by crayfish plague which is carried by signal crayfish.

North American mink (*Mustela vison*) are present on the River Hamps and the author has observed them whilst fishing. These are hunted occasionally by mink hounds. In this area there has been no control of mink using rafts and traps, as carried out on the Dove and Manifold by Derbyshire Wildlife Trust (to protect water voles).

Goosander (*Mergus merganser*) are present throughout the Hamps catchment and the author has observed females with broods of young on the LDFFA section on numerous occasions in the spring and early summer. This saw-billed duck feeds on fish and is thought to be responsible for a measurable reduction in trout and grayling numbers in many Peak District rivers. The Swainsley Club on the River Manifold have experienced a large fall in numbers of grayling and small trout in catch returns over the last 18 years, and have held a licence to shoot small numbers of goosander (as an aid to scaring) for the last six years; this does not appear to have been effective in improving fish numbers.

3.0 Habitat Assessment

3.1 Upstream of Dukes Lane Bridge

For much of this stretch the river is shaded from either one or both banks by a single tree line of alder, sycamore, willow, hawthorn, rowan, wych elm and ash. Some of the willows are bay-leaved willow (*Salix pentandra*), a characteristic upland species uncommon in the region. Land use is generally grazing pasture or mowing grass on both banks, with some wet areas in lower lying fields with stands of rush (*Juncus* sp.). Upstream of Papermill Farm the river becomes more open and trees are less frequent.

This section of river is characterised by stone pitching against one or both banks of the river (Photo 1). This bank reinforcement is obviously many decades old (probably pre-Victorian), and has mature trees growing on and though it; it is likely to be associated with the milling which historically occurred in this area:

..and at the hamlet of Winkhill are two paper-mills, a flax-mill, and an iron forge and foundry..

[From: 'Watchett - Waterstock', A Topographical Dictionary of England (1848), pp. 484-486. URL: <http://www.british-history.ac.uk/report.aspx?compid=51381>]

The stone walls laterally constrain the river within a fixed channel, restricting the natural processes of erosion and deposition. This can be seen by looking at the planform of the river from maps or satellite photos (see Google maps), and comparing this section with the more meandering reach downstream of Dukes Lane. Where it is between stone walls the river tends to lack meanders and bends, and hence lacks pool habitat. Pools form on the outside of bends where erosion takes place, and the resulting material is deposited on the inside of bends creating gravel side-bars and riffles.

Much of the river habitat upstream of Dukes Lane is therefore shallow and rocky, and whilst this provides good habitat for juvenile stages of trout there is a dearth of deeper areas which would be suitable habitat for adult trout.

Near Papermill Farm (SK 06546 50747) there is stand of snowberry on both banks, and just upstream is a nice example of some Large Woody Debris (LWD) in the channel where some bay-leaved willows have 'hinged' into the channel but remained attached to their stumps (Photo 2). This is exceptional and there is generally little LWD in the river channel in this reach.



Photo 1 Stone pitching on the banks of the river



Photo 2 Natural LWD in the river channel

There are cattle crossings across the river (at SK 06459 50752 and SK 06361 50868) where the dairy herd from Papermill Farm cross the river regularly. Both are reinforced with concrete, but the steep access track to the upstream crossing has previously been a source of organic enrichment to the river when rain has washed accumulated cattle faeces down the track and into the river (Photos 3 and 4).

Between the cattle crossings is an Environment Agency fisheries survey site. The river is quite heavily shaded here with sycamore and alder in a single tree line along both banks. The left bank is a field of mowing grass protected from grazing by an electric fence. A small tributary enters the river on the right bank (SK 06318 50780), and upstream of here is one of the few areas of pool habitat on this reach, where the river makes a sharp left turn against a high bank.

Above Papermill Farm the river is again constrained between stone reinforced banks. Another small tributary enters from the right bank (SK 06264 50943) via a short section of concrete pipe adjacent to the river. This may cause access difficulties if trout wished to run up this stream to spawn, if the pipe becomes perched above the main river channel.

The meadow upstream of this tributary is fenced on the right bank, and there has been some willow spiling carried out on the outside of a bend to protect it from erosion (Photo 5). Progressing upstream the margin between the fence and the river widens and there is an excellent strip of tall marginal vegetation alongside the river, comprising rose bay willow herb, meadowsweet, butterbur, cow parsley and tall grasses (Photo 6).

The right bank fence and marginal vegetation continues into the next meadow, opposite the private house and garden on the left bank, although the fence is closer to the watercourse. Just downstream of the house the river turns a sharp right and creates another deep pool: valuable adult trout habitat. There are some nice low-growing small willow trees on the left bank in the garden providing some good low cover over the river (Photo 7).

There is another private dwelling on the left bank at the upstream end of the right bank meadow. Here the river turns sharp right, and the wall at the edge of the dwelling forms the bank on the outside of the bend. Here, the



Photo 3 Steep track from Papermill Farm leading down to cattle crossing (below)



Photo 4 Cattle crossing - a source of organic enrichment



Photo 5 Willow spiling on right bank upstream of Papermill Farm



Photo 6 Excellent riparian vegetation



Photo 7 Low cover provided by willow trees (far bank) and a good, although narrow, strip of marginal vegetation (near bank)



Photo 8 Willows planted on the outside of the bend and protected by electric fencing to arrest erosion

right bank barbed-wire fencing gives way to an electric fence which continues to where the land rises up a steep embankment.

On the right bank between the private dwelling and the embankment, willows have been planted on the outside of a bend in the river to protect the bank from erosion. The willows have become well-established and are perhaps 10 ft high in places. The LADFFA top boundary occurs about halfway along the steep embankment upstream of these willows.

3.2 Downstream of Dukes Lane

This section of river is more open than the upstream section, with few trees on the left bank, and three wooded areas on the right bank. There is higher ground on the right bank and some steep, shale cliffs drop down to the river in several areas; in contrast the left bank is low-lying and is used for dairy cattle grazing and grass meadow.

There is no stone bank revetment in this section and the river has a more meandering planform. Deeper pool habitat is more frequent than on the upstream section, and this tends to occur on bends where erosion is occurring on the outside of the bend, and deposition on the inside and downstream of the bend creating gravel side bars and riffles.

The left bank is not fenced and is accessible to livestock right up to the water's edge. In limited areas cattle have access into the river to drink (for example just below the large pool downstream of Dukes Lane bridge), but for the majority of the length the high vertical banks prevent stock access to the river. Stock grazing to the fall of the bank has restricted the growth of marginal vegetation on the left bank, and left it more vulnerable to increased rates of erosion. The increased rate of erosion has led to an overwidening of the river channel in some areas. There are numerous areas of vertical earth bank, and some of these are utilised by kingfishers for nesting (Photo 9).

In some areas, the vertical earth banks and grazing have lead to a lack of cover for trout in pool areas. The lack of cover in these areas prevents adult trout from utilising otherwise suitable areas with a good depth, and leaves them vulnerable to predation, particularly by goosander (Photo 10).

There are one or two areas with LWD in the river channel, but generally it is lacking in this reach. LADFFA tend to remove fallen timber from the river



Photo 9 Earth bank with hole used for nesting



Photo 10 Contrast between banks with and without livestock access



Photo 11 LWD in the river channel

channel during annual working parties. The presence of LWD has been shown to be extremely important in several respects:

- An increase in the diversity of flow, depths and velocities
- Development of high in-channel physical habitat diversity
- Significant benefits to the control of run-off at the catchment scale
- Good habitat for a variety of invertebrates (river flies) including 'shredding' species
- Increased habitat quality and availability for juvenile and adult trout and grayling
- Refuge areas for fish to escape predation

4.0 Conclusions

Spawning and juvenile habitat are generally good throughout the fishery.

Tree cover is good on the upper part of the fishery and there is a nice mix of tree species and shading. The lower part of the fishery is more open and would benefit from more low cover on the left bank.

The upper section of the river (above Dukes Lane) is generally confined between stone-walled banks and hence lacks a diversity of depth; the river tends to be shallow and lacks deeper pool habitat.

The lower section has more pool habitat, but grazing pressure and lack of cover on the left bank is preventing this from reaching its full potential for holding adult trout.

There is generally a lack of LWD in the river channel throughout the fishery.

5.0 Recommendations

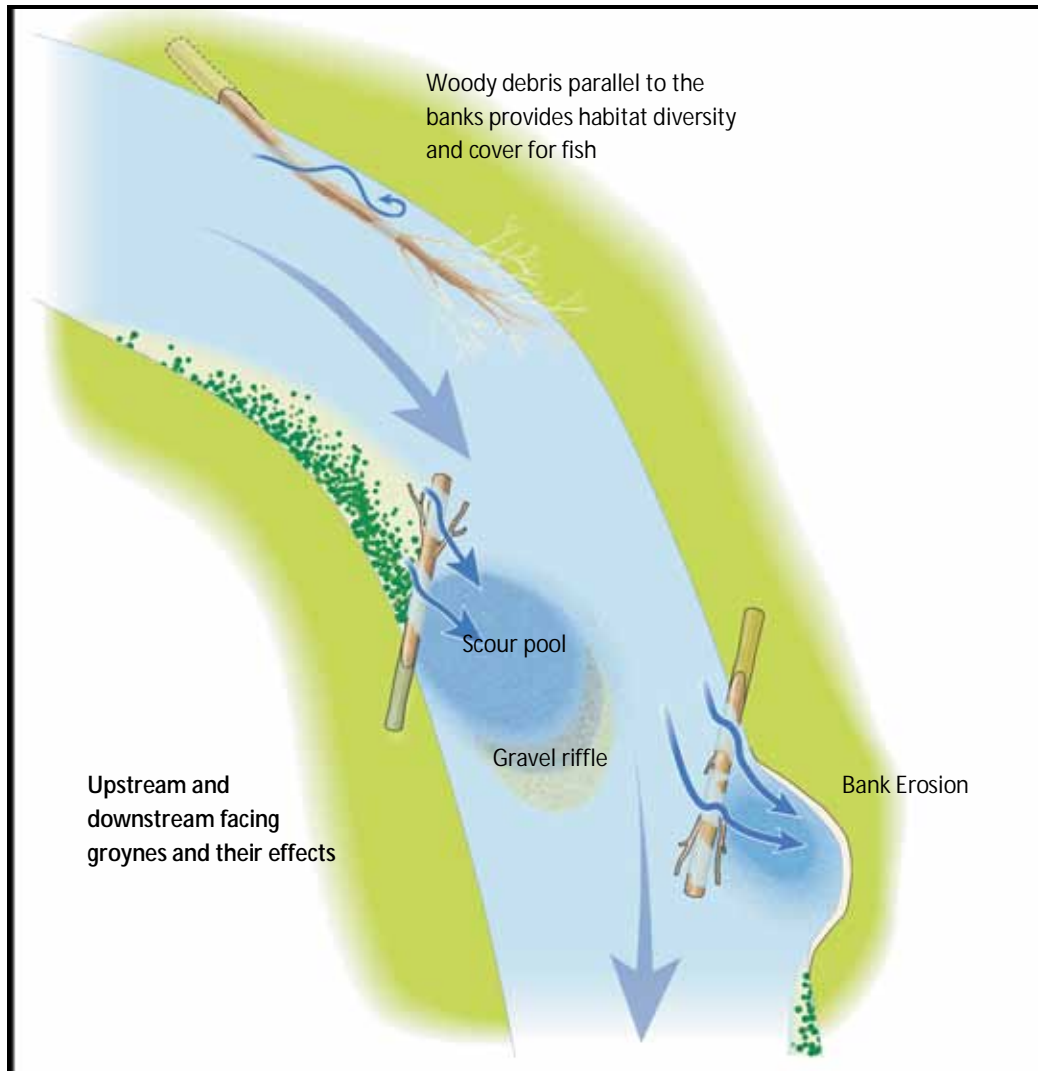
5.1 Increase the amount of instream cover for fish, to increase the carrying capacity of the fishery and provide refuge for fish from predation (particularly by goosander). This can be achieved in a number of ways:

- Adopt a policy of retaining natural LWD in the river channel unless it is causing significant problems. 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 a 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.

- Deliberately introduce LWD to the river in selected areas to improve habitat diversity and cover for fish. There are abundant opportunities for hinging selected trees into the river on the more heavily shaded section of the river (upstream of Dukes Lane). This involves partially cutting through the trunk and pushing the tree over, leaving it attached to the stump (mimicking the effect seen in Photo 2). Woody debris groynes can be fixed parallel to the bank, or facing upstream (see diagram). Downstream facing groynes are not generally recommended as they may cause bank erosion.



- Introduce brushwood to the river in to provide refuge for fish from goosander predation. Brushwood could be cut locally or sourced from trees being introduced to the channel as LWD. Brushwood bundles can be staked alongside banks and may also provide additional benefit by

reducing rates of erosion in some areas; for example the two large pools downstream of Dukes Lane bridge. This technique would also benefit the club's water on the Dove at Crowdecote.



Photo 12 Brushwood bundles can be easily constructed by working parties

- 5.2 Fence the left bank downstream of Dukes Lane. A fence well back from the edge of the river would improve marginal vegetation and help to increase the stability of the bank. The fence could be a permanent two-strand barbed wire fence, or electric fencing which would be cheaper, but require regular attention. It is recommended that the club liaise with Andrew Heath of the Trent Rivers Trust who can advise on landowner liaison and Catchment Sensitive Farming grants for riverside fencing.
- 5.3 Introduce low cover against the left bank in selected pool and glide areas downstream of Dukes Lane (e.g. Photo 13). It is suggested this could be achieved using a combination of logs and brushwood fixed along the base of the vertical banks just at or slightly beneath summer water levels (see Figure 1). This needs to be done in combination with fencing, and willow whips could be planted on top of the bank. It is recommended these are goat willow (*Salix caprea*), grey sallow (*Salix cinerea*) or bay-leaved willow (*Salix pentandra*) which can be pruned to create low bushy growth, rather than taller species. Cuttings from local plants are recommended.

Caution should be exercised not to damage areas of earth cliff used by nesting birds such as kingfisher. Professional advice should be sought regarding this.



Photo 13 Example of location which would benefit from increased instream and overhanging cover on the grazed bank.

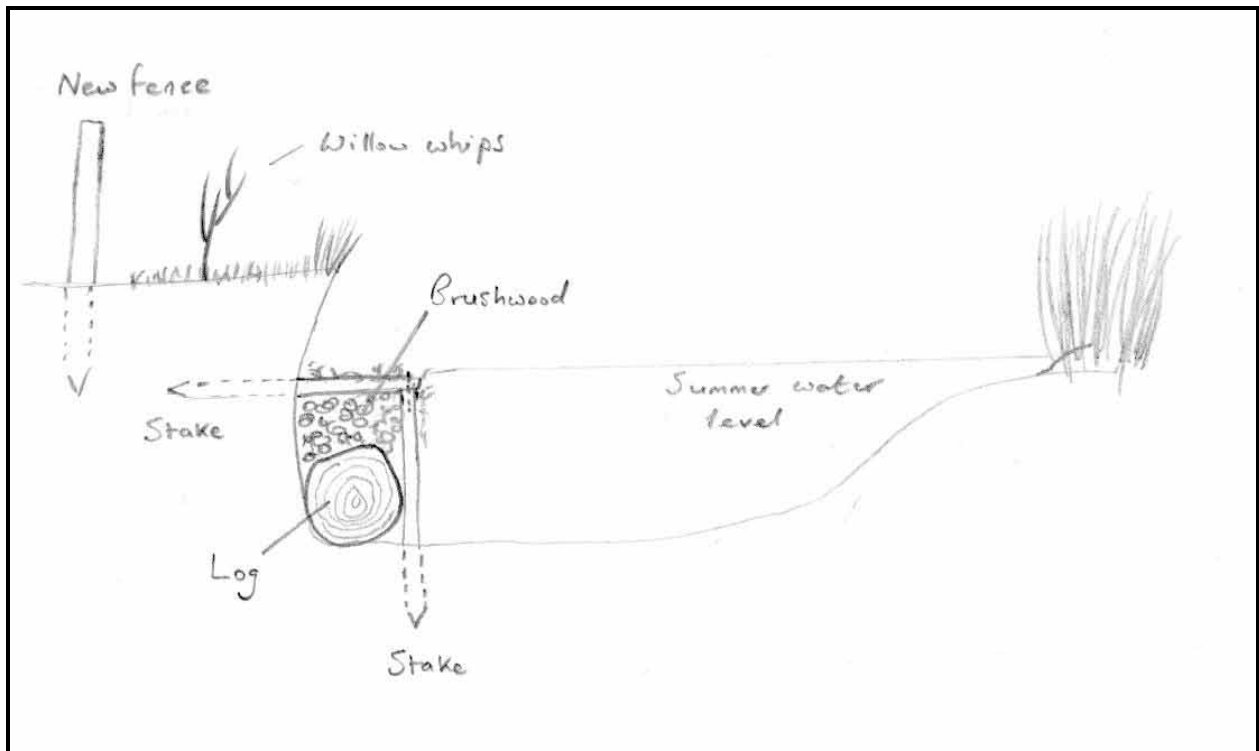


Figure 1 Log and brushwood narrowing, cross-section view

- 5.4 Stabilise quickly eroding banks in selected areas. There are a small number of areas where erosion of the river banks is taking place at a rate above that which is considered natural or desirable (Photo 14). These areas would benefit from stabilisation to prevent over-widening of the river channel. 'Log and Christmas tree' type revetment is recommended in these areas. Professional advice should be sought regarding this. The same comments regarding nesting birds as above apply.

In the areas where willow spiling has already been installed, this would benefit from laying to the level of the top of the bank to prevent water pressure blowing-out whole trees in floods, and to fill in existing gaps between the trees. Further willow spiling is not recommended (e.g. on the lower section of the fishery) because its vigorous growth may mask earth banks used by nesting birds, and it incurs a burden for future maintenance.



Photo 14 Area of rapidly eroding bank

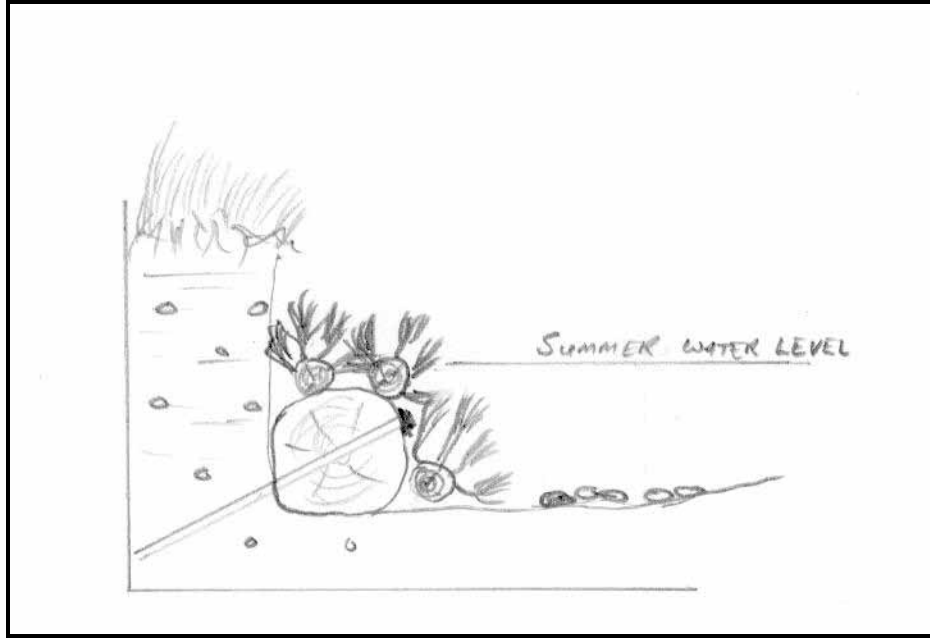


Figure 2 Log and Christmas tree revetment, cross-section

- 5.5 It is recommended that pool habitat is created on the walled section of river upstream of Dukes Lane. Ideally this would be achieved by the removal of the stone revetment allowing the river to create features through natural processes. This has the disadvantages of being likely to be unpopular with landowners, disrupting the good tree cover that is inextricably linked with the stone revetment, and taking a long time to achieve the desired objectives.

If the revetment remains in place, more pool habitat can only be achieved by the construction of some type of weirs or channel constrictors. This is potentially a controversial suggestion, because the construction of weirs in a natural river channel is not generally beneficial to the overall geomorphology and biodiversity of the river. However given the above circumstances, it is felt justified to recommend carefully designed and positioned structures of this kind.

The types of structure that would be suited to this stretch include notched log weirs, so-called K-or V-dams, and single notch or vortex stone weirs, and channel constrictors (O'Grady 2006). Certain basic principles should be followed including

- Weirs should be constructed downstream of gradient break points where they will not significantly impound flows upstream and cause siltation
- If there are numerous gradient break points in the walled reaches, the steepest should be selected for weir construction
- The structures should be at least seven channel widths in distance apart
- The structures should be only slightly higher than summer water levels; they are intended to create depth by creating scour downstream of the structure, not by impounding water upstream.

Professional advice should be sought on the design, positioning and construction of these structures.

- 5.6 It is recommended that club members and guests ensure their fishing equipment (especially nets, waders and felt-soled wading boots) are thoroughly dried (preferably in direct sunlight) or disinfected after use on the river to prevent the spread of the crayfish plague. Further details can be found at http://publications.environment-agency.gov.uk/pdf/GENW0606BLAI-e-e.pdf?lang=_e.

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.

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 Hamps. This AV represents one of several ways the WTT can provide assistance to implement the recommendations. Others include:

- 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. 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.
- 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 should 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 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.

8.0 References

O'Grady, M.F. (2006) Channel and Challenges. Enhancing Salmonid Rivers. Irish Freshwater Fisheries Ecology & Management Series: No. 4, Central Fisheries Board, Dublin, Ireland.