River Whitewater – Whitewater Syndicate

An advisory visit carried out by the Wild Trout Trust – January 2012

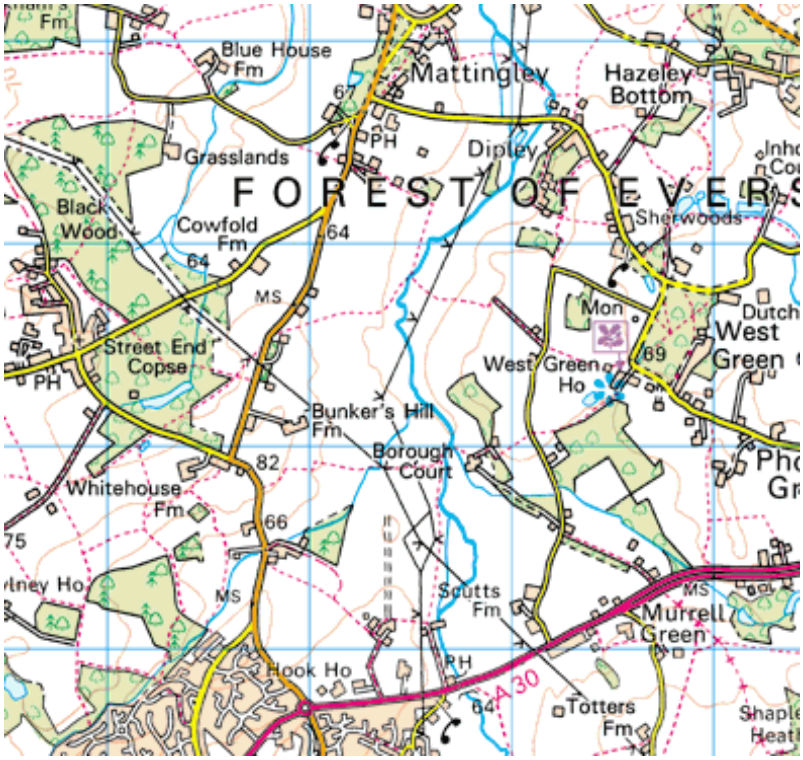
1. Introduction

This report is the output of a Wild Trout Trust advisory visit undertaken on a 3-km reach of the River Whitewater between Dipley Mill (NGR SU 741 575) and the Crooked Billet at Hook (NGR SU 736 551).

The request for the visit was made by Mr. Patrick Mitford-Slade, who leases the fishing rights and manages the fishery on behalf of the Whitewater Syndicate.

Comments in this report are based on observations on the day of the site visit and discussions with Mr. Mitford-Slade and Mr. Dominic Martyn, who is the local Fisheries Technical Officer with the Environment Agency.

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.



The Whitewater running down from Dipley Bridge to the mill just downstream of the Crooked Billet pub.

2. Catchment overview

The River Whitewater, along with the River Lyde and the upper reaches of the River Loddon, form a network of north-easterly flowing Hampshire chalk streams. The Whitewater rises from the underlying chalk aquifer and bubbles up as springs in the Greywell area. The spring water percolates into a large, peaty fen habitat (Greywell Fen), which is an important nature reserve and designated as a Site of Special Scientific Interest. From here a single channel is formed and the river flows north where it joins the Blackwater before flowing into the Loddon near Swallowfield.

Near to its source in the Greywell and Odiham area, the Whitewater has classic chalkstream characteristics of stable flow and clear water. The underlying geology changes once the river reaches the Hook area, where the river passes over a mainly clay/gravel substrate, which results in a more unstable flow regime, slightly steeper banks and a tinge more colour to the river than is found in the upper reaches.

The River Whitewater is currently a priority water body for improvement action under the Water Framework Directive, where, according to monitoring work undertaken by the Environment Agency, the river is failing to achieve Good Ecological Status (GES) due to poorly performing fish populations. A number of factors are thought to be responsible, including diffuse pollution pressures, and fragmented habitat mainly caused by the numerous barriers found throughout the system.

3. Fishery overview

The 3-km reach controlled by the Whitewater Syndicate has been managed as a stocked brown trout (*Salmo trutta*) fly fishery for more than 30 years. Reasonable numbers of wild trout are found throughout the fishery but stocking with hatchery derived fish has always been felt to be necessary on this beat to augment the numbers of wild fish.

Angling pressure is limited to 25 rods, who are able to fish mainly the LB for two named days a week. Monthly introductions of fish take place throughout the fishing season, with a total of five separate stockings of up to 180 fish on each occasion.

Mr. Mitford-Slade has managed the fishery for many years and has carried out works designed to improve the trout holding capacity of the fishery through the construction of a number of small stone weirs. The value and performance of these weirs is discussed in more detail in the section below. Other initiatives include stock fencing to reduce bank grazing pressures.

During his tenure, Mr. Mitford-Slade has seen the quality of the fishery decline, with what appears to be reduced flows and the resulting implications of poor in-channel weed growth and reduced fly life. It is thought that the expanding conurbation of Hook is threatening the quality of the fishery through increased demand for water resources and through increased pollution risk. Mr. Mitford-Slade is looking for options for habitat management that will help the river to

adapt to the likely reduced water resources in the future and is keen to explore options that will improve habitat for both wild and stocked trout.

4. Habitat assessment

The very bottom section of river upstream of Dipley Bridge is heavily impounded by the structure at Dipley Mill. This has resulted in a long, slow flowing section of river, passing gently over a mainly soft silt river bed. It is understood that this bottom section is popular with members, which is surprising given that the in-channel habitat for trout is rather poor. The popularity of this beat may reflect the easy access for angling.

The LB in particular is heavily lined with mainly alder trees and the lack of in-channel weed growth, due in part to significant shading. The lack of weed growth may be compensated for to some extent by the presence of extensive alder root systems which will be providing useful cover for adult trout.

Bottom beat just above Dipley Mill. Poor habitat for flow loving fish species.

Sections of RB (non fishing bank) between the mature alder trees have been closely mowed and in several sections there was evidence of bank erosion. Some attempts to address bank erosion have been made by driving in vertical wooden poles into pockets of a non degradable geotextile. These defences will provide some short term protection, but the nature of the bank and the significant shading prevents the growth of plants with root systems that would provide long term protection from erosion.

Approximately 250m above the bridge there is evidence of the raised channel leaking into the low level parallel water course running adjacent to the LB. Maintaining artificially high milling embankments is often fraught with difficulty

as water inevitably tries to find the lowest point. It is possible that the comparatively recent arrival of non native signal crayfish (*Pacifastacus leniscul*us) is exacerbating the problem particularly as some banks are quite narrow. Signal crayfish tunnel into banks and make them more susceptible to erosion.

A line of posts and geotextile installed on the RB is unlikely to halt bank erosion.

Spillway feeding water down into the small channel running parallel with the LB

Water percolating through the perched LB into the side channel. This area is extremely vulnerable to a complete breach.

A brief discussion took place regarding the possibility of directing more of the current flow through a new structure into the low level channel that bypasses the Dipley Mill impoundment below. This change would undoubtedly create some excellent quality habitat and would have the additional benefit of opening up access for species wishing to migrate up and down this section of river. It was thought that such a diversion would be extremely unpopular with the riparian owner of the RB, who would lose existing river frontage and also the owners of Dipley Mill, who enjoy milling rights.

A key feature of the first 300m of channel is the large number of very mature alder trees. There appeared to be very little variation in these trees, with all the trees set in a single line along the top of the bank and most appearing to be the same height. There is a danger that many of these trees could collapse at the same time, so it would be sensible to undertake some limited coppicing of randomly selected short sections to create a more diverse range of age and height and avoid the possibility of a significant proportion of the tree cover falling during a storm. Coppicing some selected trees will protect the important root systems and promote a valuable dappled light and shade regime. When planning how much coppicing to do, remember that any alder coppice will need to be rotationally reworked on a 5-10 year cycle to avoid intense shading in the future. Little and often is the best approach.

At the end of the wooded section, the river is bordered by grazing meadows on both banks, although the RB meadows appear to be much wetter and the grazing less intensive. On this reach, the characteristics of the river begin to

change as the influence of the Dipley Mill impoundment is lost. The average channel width is narrower than that found in the lower section. This slightly pinched channel and shallower depth encourages elevated water velocities, giving the river a more natural form.

River channel upstream of the lower wooded section.

Slightly raised LB to the river and what might be the remains of the original course of the river meandering through the middle of the meadow.

The route of the existing channel appears to be diverted from the lowest part of the flood plain and there is some evidence of a raised LB margin. It is not clear if this slightly raised bank is still associated with the original diversion to create the head for Dipley Mill, or as a result of extensive dredging work that was carried out on most of the Thames Valley rivers in the post war years. The possibility of rehabilitating a natural meandering channel flowing through the lowest part of the floodplain could be an exciting opportunity but would require agreement from all parties and significant resources.

A little further upstream some good examples of sensitive management can be found. At one point a small tree has blown over and has been lightly trimmed so that the trunk still projects well out into the channel, providing overhead cover and the opportunity for some local river scour when water levels rise.

A small fallen tree has folded into the channel pinching the width and promoting local bed scour. A great lie for an adult trout.

Submerged in-channel plant growth in the lower half of the fishery was surprisingly sparse. The occasional bed of starwort (*Callitriche palustris*) was evident, and a few isolated beds of water milfoil (*Myriophyllum sp*) were also seen. Good thick stands of marginal emergent plants were present, including: reed canary grass (*Phalaris arundinacea*) and reed sweetgrass (*Glyceria maxima*).

Although the LB was unfenced, there did not appear to be any evidence of severe bank damage caused by grazing animals. There is often a desire to fence all sections of river from grazing livestock but provided stocking densities are kept low, some grazing can reduce bank maintenance requirements.

A section of channel which works well. A lightly grazed margin creating a low level berm below a section of naturally pinched channel.

Dead annual herbs gently folding into the channel and providing very good winter cover for juvenile trout. Strimming river banks in the autumn is an activity often carried out on some sections of Hampshire chalkstream but is a practice that is damaging to habitat for small wild trout.

Towards the middle of the beat, some shallow gravel bottomed glides and occasional riffles were found. Unfortunately, the spawning habitat on some sections of the reach is quite poor, with much of what appears to be gravel being made up of nodules of tufa (calcium carbonate deposit). Trout will attempt to spawn in these areas but the bed material is often very compacted and naturally cemented, making the construction of viable redds for trout very difficult. Some

cleaning of gravels in strategic areas can significantly help to improve the conversion of eggs to fry.

Tufa deposits can give the appearance of good quality gravel beds. If loosened, to break up the crust and blow out the silt then trout can successfully spawn on this bed material.

A redd at the head of a gravel riffle where some good quality gravel was found. Providing enhanced cover in the margins of shallow riffles is important to provide cover for juvenile trout once they emerge from the gravels.

A comparatively rare riffle habitat that should provide ideal habitat for trout fry and parr. Currently only a thin fringe of cover is available on the RB. Carrying capacity could be significantly boosted by laying in woody brashings adjacent to the LB.

At this point the first in a series of stone and concrete bagwork weirs can be found. The weirs were originally installed to raise water levels and provide some deeper holding water for adult trout. Many of these weirs are failing to provide increased water depth because the river has regraded its bed upstream of the weir and filled the impounded sections with fine deposits. In addition, some structures have been configured in a way that has encouraged lateral bank scour, resulting in an overly wide channel immediately downstream of the structures. Both of these effects are the river's natural (if unwanted) response to the weir.

Small log and rock weirs are often installed by fishery managers in an attempt to create holding water for adult trout. Many of these structures, rather than providing an improved habitat for trout, result in a degraded habitat where the natural gradient of the channel is replaced with a series of steps. One or two good quality lies can often be found in the scour holes downstream of such structures but this is often at the expense of long sections of flat and impounded channel upstream, where flows are slowed and sediment deposited. A more sustainable approach to creating better lies for trout is to restore the gradient and locally pinch the channel with large woody debris flow deflectors that promote downward bed scour. This will enable some depth for lies to be created. Typically, a section of glide can be transformed in this way to provide many holding lies and provide a much better environment for plants, invertebrates and flow loving fish species.

A notch in a bag work weir causing erosion to the LB.

A typical low weir found on the beat. Cutting a notch in the middle will help to pull the water through faster above the structure.

One or two other weirs have breached and where narrow flumes of water have blown through some good habitat has developed. These examples provide a model of how some good lies can be created with large woody debris flow deflectors. The advantage of the log deflectors is that they do not impound the flow as much as whole width weirs and the woody material provides a source of food and habitat for a range of aquatic invertebrates.

A more valuable and alternative option would be to drop and pin a tree trunk to do exactly the same job.

Another weir ripe for notching

Towards the upper half of the fishery the first signs of beds of water crowfoot (*Ranunculus spp*) were seen. This is an iconic chalkstream plant and is very valuable, especially for some species of upwing river flies.

Crowfoot will generally only flourish in reaches where there is a firm, gravelly river bed and vigorous flows. Sections that are currently impounded by low weirs will not be conducive for crowfoot growth.

Luxuriant crowfoot growth in the upper reaches of the fishery. A valuable plant for trout and fly life.

Valuable bankside trees for trout include thorn bushes and elder. These species and goat willow or sallow can promote water-level, scrubby cover which is extremely valuable as a comfortable holding spot for adult fish and as a safe refuge from predators for juvenile trout, particularly in shallow margins.

Some sections of channel provided reasonable bank-side cover for adult trout, although there were a few sections where some planting of sallows (*Salix caprea*) to create low level cover would be beneficial. Whips can be easily cut from other local trees and pushed into the toe of the bank, just above the normal water level at a 45 degree angle.

A good trout lie. A sallow, sympathetically trimmed to provide some access for a cast.

One or two sections of bank were damaged by cattle poaching.

On the whole the river banks were in reasonably good condition , although there was some evidence of cattle damage near to the top of the fishery. A brief conversation took place with the farmer, Mr Tony Foster from Bunkers Hill Farm.

He did not rule out the possibility of stock fencing but would require purpose build cattle drinking bays.

On the RB near to the top boundary of the fishery the landowner has carried out some inappropriate work by scraping the bank with an excavator. It is believed this work was carried out as routine maintenance by the land owner opposite but the work is damaging riparian and in-channel habitat. It is understood that the Environment Agency are aware of the work.

All the plants and bankside cover in a 100m section of RB have been scraped out with a machine leaving an over wide channel devoid of any useful cover

A more sustainable method of controlling the encroachment of emergent plants is to locally clear some short sections and plant small blocks of riverside trees to promote local shading. Willow would be the obvious choice.

Some potentially good quality spawning and nursery habitat exits on the very top section but the recent work carried out on the RB has seriously damaged the potential for good recruitment during this spawning season.

A section of channel where reed encroachment is beginning to close the channel. Sections like this benefit from the odd clump of willow to help shade the channel and limit emergent reed growth.

Potentially a great reach for juveniles but now desperately lacking cover.

5. Conclusions

The section of Whitewater flowing between Hook and Dipley has significant scope for enhancement.

The lower 400m of channel is heavily influenced by the Dipley Mill impoundment and any opportunities to enhance this reach are strongly linked to how the mill is managed in the future. A reduction in the head height at the mill would significantly improve habitat quality upstream.

The greatest scope for improvement lies within the reaches where the series of low weirs have been installed. Removing some or all of these structures would pull water through faster and enable a different approach. Improved lies could be created through downward bed scour rather than trying to hold up water levels. We would recommend to identifying two or three existing weirs and replace them with either single or paired log flow deflectors.

If large woody debris deflectors are used, the bankside section must be well keyed into the bank and they should be configured to point slightly upstream, to encourage scour to the centre of the channel rather than towards the bank.

Small paired deflectors with narrow central notch

As well as using woody debris to promote bed scour, whole trees and brashings can also be usefully used to create in-channel refuge areas. This is particularly important when trying to build the wild component of the stock, where coarse woody debris brashings can either be laid or pegged and wired into shallow runs.

There were long sections of river inspected that would benefit from much more in-channel cover of this type.

An example of brashings pegged into the margins to provide enhanced cover for juvenile trout on the upper Loddon

Some efforts to improve gravel quality, particularly near the top end of the fishery, would pay dividends. Much of the gravel seen was flat, compacted and heavily infiltrated with sediments. Blocks of LWD pegged onto shallow gravel runs can help to sort and loosen compacted gravels.

A short upstream facing “V” structure pegged onto a gravel run and designed to improve spawning opportunities. These structures also create small holding pots for spawning adults and holding lies for juvenile trout

There is plenty of scope to improve lies for adult trout throughout the fishery. Most of the current shading on the fishery comes from tall trees which do not provide the low-level, scrubby cover favoured by trout. Some planting of sallows jutting out form the toe of the bank to overhang the water would be extremely valuable. When coupled with a large woody debris (LWD) flow deflector to promote some local bed scour, sites can be created to provide superb holding lies. Some low level shading will also help to control excessive reed encroachment and might also help with maintenance, rather than just creating more work.

A rare sallow overhanging a section of the River Test –a fantastic holding spot for trout. Note the trunk swings out almost parallel with the water level before sprouting upwards. Similar whips or small stakes can be planted to create great lies within a season or two.

Very little in the way of large woody debris was observed within the channel on the main fishing beat. 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. Streams with adequate LWD tend to have greater habitat diversity. Therefore, LWD is an essential component of a healthy stream's ecology and is beneficial in maintaining the diversity of biological communities and physical habitat.

Traditionally, many land managers and riparian owners have treated LWD in streams as a nuisance and have removed it, often with uncertain consequences. Stream clearance can reduce the amount of organic material necessary to

support the aquatic food web, remove vital in-stream habitats that fish will utilise for shelter and spawning. In addition, LWD improves the stream structure by enhancing the river bed make-up and diverting the stream current in such a way that pools and sometimes spawning riffles, where underlying gravel is present, are likely to develop. A stream with varied river bed material is ideal for benthic (bottom dwelling) organisms as well as for fish species like trout.

Increasing the number of attractive lies for adult trout will not only improve the quality of the angling experience, it could also save the club money. If any fish, including stocked fish, cannot find a comfortable lie, then it is highly likely to turn downstream and keep moving in search of one. The more secure lies you can create the more fish you will retain. An additional benefit is that when angling, if a fish is spooked, it is less likely to bolt long distances upstream, unsettling other fish on the way.

6. Recommendations

- Consider the removal or modification of a number of the installed weirs.
- Harness increased water velocities obtained through weir removal to use against LWD flow deflectors. This will create more variation in the bed topography and better lies for trout.
- Consider planting low goat willows to manage emergent plant encroachment and to provide better winter cover and improved lies for trout.
- Use tethered brash bundles installed in the margins, especially in the margins of shallow runs.
- Consider undertaking some work to improve gravel quality and hence spawning success right at the top end of the fishery. Pegging in short sections of woody debris at right angles to the flow is a good option to keep gravels clean. An October programme of raking sediments from likely spawning spots is also recommended. Do not clean all of the gravel but 1 to 2m^2 sections on the tail end of likely looking glides.
- Consider coppicing some of the blocks of mature alder near the bottom boundary of the fishery

It is a legal requirement that some works to the river may require written Environment Agency consent prior to undertaking those works, either in-channel or within 8 metres of the bank. Any modifications to hard defences will require a land drainage consent on any river designated as "main river". Advice can be obtained from the EA's Development Control Officer.

7. Making it happen

There is the possibility that the WTT could help to start an enhancement project. We could potentially help to draw up a project proposal (PP) which could be used to support any application for Land Drainage Consent. The PP might also be used as a document to be shared with potential partners as a vehicle for raising project funding.

Alternatively, physical enhancement works could be kick-started with the assistance of a WTT 'Practical Visit' (PV). This approach is probably more appropriate for works to the side carriers. PV's typically comprise a 1-3 day visit where approved WTT 'Wet-Work' experts will complete a demonstration plot on the site to be restored. This will enable project leaders and teams to obtain on the ground training regarding the appropriate use of conservation techniques and materials, including Health & Safety, equipment and requirements. This will then give projects the strongest possible start leading to successful completion of aims and objectives.

Recipients will be expected to cover travel and accommodation expenses of the contractor.

There is currently a big demand for practical assistance and the WTT has to prioritise exactly where it can deploy its limited resources. The Trust is always available to provide free advice and help to clubs, syndicates and landowners through guidance and linking them up with others that have had experience in improving trout fisheries.

Acknowledgement

The WTT would like to thank the Environment Agency for supporting the advisory and practical visit programmes.

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