



## River Whitewater – Greywell Fly Fishers



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

## 1. Introduction

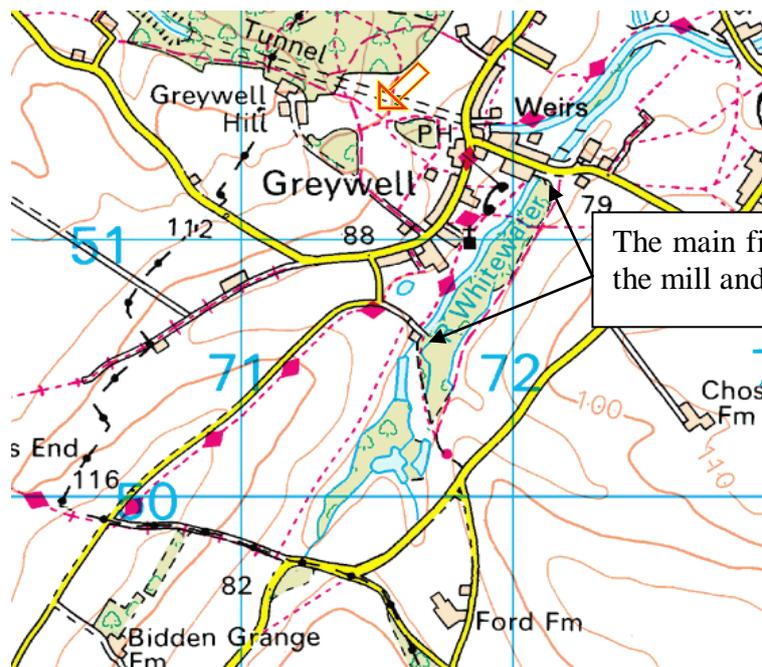
This report is the output of a Wild Trout Trust advisory visit undertaken on the River Whitewater at Greywell (NGR SU717508 down to SU721512).

The request for the visit was made by Mr. Trevor Ashton, who serves on the committee of the Greywell Fly Fishers, lessees of the fishing rights. Comments in this report are based on observations on the day of the site visit and discussions with Mr. Ashton and Mr. John James, representing GFF and Mr. Mike Moreton, who is the Reserves and Grazing Project Officer with the Hampshire and Isle of Wight Wildlife Trust. At the time of the visit, work to coppice trees on the Fen was imminent and Mr Ashton wanted to explore any possible opportunities for utilising local woody material to enhance river habitat.

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. Catchment overview

The River Whitewater, along with the River Lyde and 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 the channel is formed and the river flows on north, where it joins the Blackwater, before flowing into the Loddon near Swallowfield.



Source of the Whitewater at Greywell

The River Whitewater is currently a priority water body for improvement action under the Water Framework Directive. 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 fishery managed by the GFF is very unusual. Some wild brown trout (*Salmo trutta*) are found throughout the fishery but stocking with hatchery-derived fish has been carried out for many years on this beat to sustain a viable fishery. The majority of the fishery sits within the area of the flat fen, where the river gently flows through soft peaty soils, with little gradient and precious little river bed gravel. Opportunities for significant augmentation of the stock via any upstream production and subsequent displacement of juvenile trout are also very limited. On the plus side, the fishery enjoys superb water quality, sitting as it does, right at the very source of the river.

### **4. Habitat assessment**

The section of river lying between Deptford Bridge upstream to Greywell Mill forms the main part of the fishery. Here the channel is dominated by smooth laminar glide habitat, over a mainly soft silt river bed. The channel shape has been largely maintained through the soft, peaty fen by installing log and faggot revetment. Beds of marginal emergent plants, such as Norfolk reed, (*Phragmites sp*) common sedge (*Carex nigra*), great tussock sedge (*Carex stricta*), as well as beds of reed canary grass (*Phalaris sp*) and sweet reed grass (*Glyceria sp*) are present. All of these plants, where established, provide a biologically rich and very robust river margin.

Significant shading by mainly alder and willow does limit riparian and in-channel weed growth in some areas but overall there is a nice balance of dappled light and shade. This has resulted in a mosaic of habitat favourable to many species, including brown trout. Within the channel itself, cover was available via marginal beds of water cress (*Rorippa sp*) and fools cress (*Apium sp*) which have encroached out from the margins in places to form thick floating mats. The marginal cress mat generally dies back quickly once frosted. Significant beds of starwort (*Callitriche spp*) were evident, this plant being a classic chalkstream plant preferring benign flow and a soft sediment bed.

In one or two areas, where the marginal emergent plants have radically pinched the channel, the very soft sediment has been blown away to reveal a thin layer of gravels. Although the gravel here might be too thin for spawning purposes, these sections will undoubtedly provide attractive holding areas for trout. Further adult trout holding habitat was found under the few overhanging trees that were present, however low scrubby branches at water level were very much at a premium.

The remains of some old corrugated tin revetment were evident in one location. This material was popular with some river keepers for bank defence works but is

now considered to be a poor substitute for a soft, planted fringe. The hard revetment is biologically sterile and provides poor quality bank defence.



A low overhanging branch providing an attractive lie for an adult trout



An encroaching fringe of cress promoting a slightly cleaner river bed by pinching the flow – again an attractive lie for an adult trout



A short section of bank revetted with corrugated tin. A poor quality margin for plants, invertebrates and fish

The channel has become excessively wide and shallow in a few sections, particularly where high level shade has restricted significant weed growth. These areas do not provide any decent quality habitat for holding trout. There is scope to improve some of these sections by introducing large woody debris (LWD) which can be configured to energise flows and create some local bed scour as well as providing in-channel cover.



A flat open glide providing precious little in-channel cover for trout

Getting the right balance between providing a safe and accessible bank from which to fish and providing optimum habitat for fish and invertebrates is difficult. Wading this beat is not an option and providing safe areas to fish from is obviously very important. The physical nature of fen habitat and the sensitivity and value of the riparian habitat means that perhaps a slightly different approach is needed. Rather than trying to maintain two fishable margins, it is appropriate to always leave one bank virtually unmanaged. A possible alternative to the current regime is to construct a footpath set well back from the RB of the river with regular spines/ narrow walkways leading off the path to small access points where fishing is possible. This will reduce the requirement for bank reinforcement and the requirement to manage a fishable access path adjacent to the whole length of the river. Selecting the number and location of suitable fishable areas will depend very much on the water that needs to be covered. Designing and creating good quality holding lies upstream of suitable access points is a sensible approach. Sections where it is impossible to cast a fly should be viewed as valuable refuge areas which will only help to improve the quality of the fishery.

At the Greywell Mill the channel splits into two, one via the mill race and another via a side hatch. Both routes look to be a significant block to upstream fish migration. Some downstream migration is possible and wild fish are found in the reach above, although good quality spawning and nursery habitat looks to be very limited. The cost of improving upstream fish migration is probably not justified by the cost at this particular site, and so would probably not be a priority for action under the WFD.

Some limited spawning and nursery opportunities are available in the channels immediately downstream of the mill and it is understood that the club regularly rake and loosen the bed gravels at the end of each season in an attempt to improve spawning success.



Decent spawning and nursery habitat available in the left hand channel below the mill.

Where the two channels meet below the mill there is a long concrete structure running downstream within the channel. It is not clear what this structure was for but it is possible that it is the side of an old raceway or stew pond. Access to better quality spawning is thought to be available via the LB channel. However, the concrete spine may well be acting as a flow deflector, pinching the channel and creating an attractant flume for fish moving up on spawning migrations. Placing a tree trunk flow deflector across the channel from the left bank could help to create a narrow flume which will help to draw fish up to the better quality spawning sites.



Confluence of the milling channels. Manipulating the flow velocities here will determine which route spawning fish are more likely to take.

The Mill pond and the braided channels above the mill pond were also inspected. Some very interesting habitat was seen, however habitats for trout were largely restricted to holding water. It is understood that there might be some shallow gravel runs on some of the small channels feeding into the fen and these may well warrant further inspection with a view to enhancement and boosting wild production. Some of these might be ephemeral (winterbournes) but still be valuable for wild trout production.



A typical section of channel up above the mill pond. Wonderful habitats for many species but not especially valuable for trout.

## 5. Conclusions

The section of Whitewater managed by the Greywell Fly Fishers supports a unique and very interesting trout fishery. The river here will always be reliant on some trout stocking to sustain the current level of angling activity but there is undoubtedly scope to improve wild trout production and also enhance the quality of lies for adult fish, both wild and stocked. The fishing club is privileged to be able to enjoy their sport in such a wonderful environment but it also brings challenges in the way access for fishing is managed in such a sensitive site.

Two actions are required to significantly enhance the fishery. The first is to undertake some work to improve the limited areas for wild trout spawning. As these areas are comparatively small, it is even more important that the spawning gravels are in good condition. There is only room for a limited number of trout redds and converting those eggs to as many viable fry as possible is important. Currently the quality of the gravels in the two channels downstream of the mill is questionable. The gravels appear to be thin, heavily infiltrated with sediment and a tad on the small side. Ideally the gravels should be in the 10 to 50mm size range and there is scope to import fresh material onto areas where the existing bed material is thin. Vehicular access to the mill is good and gravels could be augmented with barrow and spade.

Both channels could be enhanced, but it would appear the left channel is longer, has a nice steady gradient and appears to have the most potential for successful spawning. Encouraging brood fish up to this channel might also be an issue and it is worth exploring if a combination of manipulating flows and pinching the

channel at the confluence might help to draw more fish into the favoured locations.

Providing some enhanced overhead cover on these potential spawning sites is also a priority as they are currently very open. If permanent cover is not desirable, then using temporary cover is useful and will provide spawning fish with more comfortable lies and provide some protection from fish-eating birds.



Fallen tree brush placed over a likely spawning site on a tributary of the Wylfe



Brushings pegged into the margins to provide enhanced cover for juvenile trout on the upper Loddon

Adjacent to and immediately downstream of the spawning sites it is advisable to create some improved cover for juvenile trout. Any juvenile trout dropping back into deep glide habitat, where there is little cover, will suffer very high levels of mortality. It is recommended to line both margins with thick brush bundles to create a matrix of micro habitats capable of supporting very small trout. This method works best in shallow water so at this location the channel should be encouraged to broaden out, with very shallow, slow flowing margins packed with cover.

There is plenty of scope to improve lies for adult trout throughout the fishery. Most of the shading on the main part of the fishery is provided by tall trees which do not provide the low level scrubby cover favoured by trout. This habitat is present on the upper reaches, but some planting of willows (*Salix caprea*) jutting out from 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 local bed scour, sites can be created to provide superb holding lies. Some low level shading will also help to control excessive cress encroachment and might also help with maintenance, rather than just creating more work.



A rare willow 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 swinging 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 substrate 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 a heterogeneous substrate 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 they are highly likely to keep moving in search of one. The more 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.

Installing traditional LWD flow deflectors may not necessarily work here in the same way that they do on most rivers. The Whitewater at Greywell is an incredibly stable environment and the river will rarely have enough energy to carve out new features. The sediments, however, are extremely soft and mobile and the introduction of LWD flow deflectors will definitely create variations in depth and flow patterns, which will create improved lies and enhance the angling experience.

The amount of woody material throughout the site means that if work is contemplated then there is no need to haul tree trunks from all corners of the fen. Simply selecting nearby trees for coppice is all that is required. Some hinging of whole riverside trees into the channel might be possible, or simply cutting trunks to shape and pegging them where desired.

Some photographs of examples of LWD installed into channels for both refuge and also to promote bed scour are set out below:



A freshly installed LWD deflector adjacent to some good overhead cover will create a good lie. The mid-channel end of the deflector points slightly upstream.



A small upstream "V" deflector designed to promote mid channel bed scour. Note the post designed to catch weed and provide cover.

In light of the difficulties associated with the very soft margins, it might be useful to have a radical appraisal of exactly where the paths are placed and maintained and how fishing access to the water is provided. The fen does not lend itself to a conventional riverside path and a long boardwalk running parallel with the bank would be ugly and inappropriate. Setting the path well back from the river and providing "T" access points where a rod can stand or kneel to either cast to a close fish, or perhaps to lengthen the cast to cover fish sitting further away without moving upstream to cover the fish. The frequency and number of these access points is of course up for the club to decide but could be linked with providing improved lies for trout. It must not be too contrived but there is scope for reducing maintenance costs and improving riparian and in-channel habitat. Maintaining a fishable bank on both sides seems at best a lot of unnecessary work and expense and may be damaging the prospects of holding more fish in the reach.

## 6. Recommendations

- Harness water velocities using LWD flow deflectors to 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
- Re-evaluate how access to the river is managed
- Use tethered brush bundles installed in the margins, especially on the section immediately downstream of the mill to create cover for both spawning adult trout and any emerging fry.
- Consider importing some fresh gravel of appropriate size to create enhanced spawning opportunities in the mill channels
- Consider manipulating flow via the mill sluices to optimise spawning success.
- Consider installing a flow deflector at the confluence of the mill streams to encourage fish to find the best quality habitat
- Continue with an October programme of raking sediments from likely spawning spots. Do not clean all of the gravel but clean 1 to 2m<sup>2</sup> sections every 4 to 5m of channel length

**It is a legal requirement that some works to the river may require written Environment Agency consent prior to undertaking any 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.

## **Disclaimer**

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