River Test, Fulling Mill, near Whitchurch, Hampshire

An Advisory Visit by the Wild Trout Trust June 2015

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Introduction

This report is the output of a visit undertaken by Mike Blackmore of the Wild Trout Trust on approximately 1km of the River Test at Fulling Mill, near Whitchurch, Hampshire national grid reference (NGR) SU 46095 47687 to SU 45899 47109). A walk-over of the site was requested by Mr Richard Maitland who is the land owner and was accompanied by Mark Burns who is the river keeper for the fishery. The visit was primarily focussed on assessing habitat for wild trout (*Salmo trutta*) and biodiversity in general.

Comments in this report are based on observations on the day of the site visit. 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.

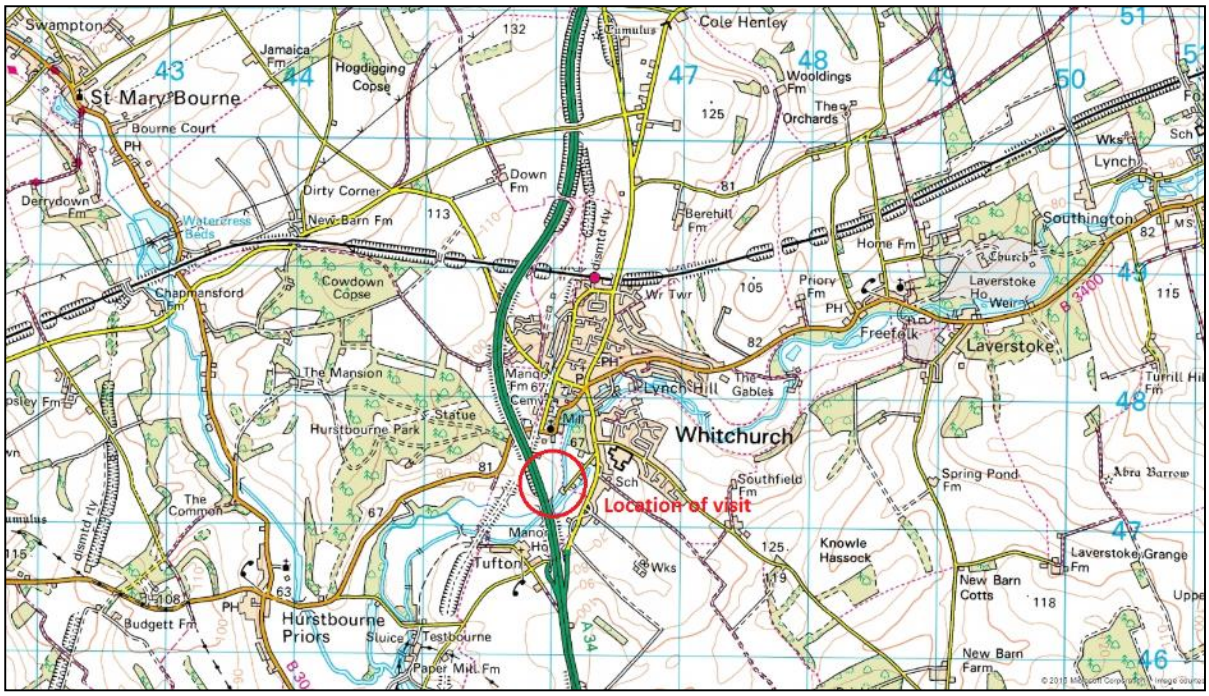

Figure 1: Map showing the location of the water visited

Catchment and Fishery Overview

The River Test is not only synonymous with the cradle of English fly fishing but is also ecologically important; designated for most of its length as a Site of Special Scientific Interest (SSSI).

The Test has a world-wide reputation for being a first class brown trout (*Salmo trutta*) fishery. Much of the middle and lower river is heavily stocked with

hatchery-derived trout to support a high level of angling activity; however, where good quality habitats are maintained, the river has the capacity to produce abundant numbers of wild fish.

Major bottlenecks to wild trout production include poor in-gravel egg survival and limited nursery habitat for juvenile fish. Where good habitat exists, survival rates of fry are usually very good in the naturally food-rich chalk stream environment.

Habitat quality on the Test varies enormously. The river channels are virtually all heavily modified, originally constructed for milling, water meadow irrigation or to consolidate flows into distinct channels to improve land for agriculture. Flow is rarely contained within a single channel and frequently flows are diverted via a plethora of side-channels and carriers, many of which are impounded (dammed) or perched (raised above the level of surrounding land), and controlled by a multitude of weirs and hatches. This situation has enabled many historical landscape features to be preserved and allowed many riparian habitats to benefit from raised water levels. It has, however, also resulted in poor and fragmented (i.e. inaccessible) in-channel habitats for flow loving fish species such as trout and salmon (*Salmo salar*) and the impoundment of flows, often leading to uniform channel dimensions and reduced flow diversity.

In more recent times, the character of the river has been heavily influenced by land drainage, urbanisation and intensive management regimes designed to facilitate fly fishing (primarily for farm-reared stocked trout). Estimates vary for the economic value of the fishery but the river is undoubtedly an important economic resource for land owners and the local rural economy in general. Some of the middle beats of the river in particular are very intensively managed and fished; in some cases, this has reduced the overall quality and diversity of in-channel and riparian habitats.

The Upper Test (Waterbody ID: GB107042022710) is classified under the European Water Framework Directive (WFD) as being in 'Good' ecological condition. This is an improvement on the 2009 classification of 'Moderate' which was driven by the failure of the river to produce the fish populations expected during that year's cycle of surveying. The biological and chemical quality of the River Test becomes generally poorer further down the catchment with some

sections failing for fish, macroinvertebrates, specific pollutants or a combination of factors. The upper Test is therefore an extremely important habitat for chalk stream wildlife.

Table 1: WFD information for the River Test visited (environment.data.gov.uk/catchment-planning/WaterBody/GB107042016460)

	2009 Cycle 1	2014 Cycle 2	Objectives
Overall Water Body	Moderate	Good	(Cycle 2) good
Ecological	Moderate	Good	(Cycle 2) good
Biological quality elements	Moderate	Good	(Cycle 2) good
Fish	Moderate	-	-
Invertebrates	High	High	(Cycle 2) high
Macrophytes	-	-	-
Macrophytes and Phytobenthos Combined	-	Good	(Cycle 2) good
Hydromorphological Supporting Elements	Not-high	Not-high	(Cycle 2) not high
Physico-chemical quality elements	High	Good	(Cycle 2) good
Specific pollutants	High	High	(Cycle 2) good
Chemical	Does-not-require-assessment	Good	(Cycle 2) good
Other Pollutants	Does-not-require-assessment	Does-not-require-assessment	-
Priority hazardous substances	Does-not-require-assessment	Good	(Cycle 2) good
Priority substances	Does-not-require-assessment	Good	(Cycle 2) not assessed

Note: Anything classified as less than 'good' is failing quality targets

Habitat Assessment

For the purposes of this report, the water visited will be described from the upstream to the downstream extent.

At the upstream limit of the reach, the river flows alongside a public footpath with the river frequented by many as a local amenity. Although there is often resistance from fishery managers to allow public access to the fishery, usually from fear of people poaching, spooking fish or otherwise disturbing anglers, allowing people to access the river at this location may have some positive outcomes. Public access is extremely limited to most of Wiltshire and Hampshire's chalkstreams. However, many of the major problems affecting chalkstream ecology, such as diffuse pollution, are catchment-wide issues that require the co-operation of whole communities to overcome.

In rural parts of the catchment in particular, effluent from old and poorly-functioning household septic tanks contribute significantly to elevated levels of phosphate in the river. Over-abstraction for domestic water supplies is also a major issue effecting chalkstreams. Although mounting pressure is being applied to water companies from the Environment Agency and various NGOs, reducing the inefficient use of water in households within the catchment is key to the reduction of abstraction from chalk aquifers. Ensuring that local people are able to appreciate and enjoy and value rivers is an important step towards safeguarding the future of England chalkstreams.

Allowing a certain degree of public access to the river can also open up sources of funding for river habitat improvements that may not be available to completely private fisheries. Of course, a balance will always need to be struck so that public access to the river does not have a negative impact on the river's ecology or the health of the fishery. Allowing the general public to observe and enjoy the river along the footpath whilst ensuring that public access into the water is limited to one or perhaps two locations (where disturbance to fish and anglers is limited) is probably the most manageable option.

At the top of the reach it is apparent that, at some point in the recent past, a line of marginal brushwood faggot bundles has been installed. This may have been to introduce additional marginal habitat or simply an attempt to abate bank erosion.

The faggots have long since degraded, leaving only the stakes that held them in place (Figure 2). Whilst it is true that relatively high concentrations of people visiting riverbanks to feed ducks, walk their dogs or even just to paddle in the river can elevate the rate of bank erosion, the erosion in this location is not necessarily an immediate cause for concern. However, marginal vegetation can sometimes struggle to flourish against the impacts of trampling by people and dogs and browsing by waterfowl; this is probably why the hazel faggots were not replaced by marginal vegetation as they biodegraded.

Figure 2: An upstream view of the upstream extent of the fishery

The reach downstream from here to Fulling Mill is very uniform in width and depth (Figure 3). This is not particularly surprising considering that the river would have functioned as a leat when the mill was in operation. Channel uniformity is a major limiting factor affecting abundance and diversity of the habitat features required to support a healthy wild trout population. In a completely natural river system, the meandering plan form of the river, in combination with natural width variation and flow deflection from submerged structures such as fallen trees, ensure that bed material is regularly scoured from the bed and banks and deposited downstream. This creates a natural sequence of pools, riffles and glides as well as a range of micro-habitats and lies for fish.

Trout require very different habitats at different life-stages and rely on a good diversity of those habitats to support the various invertebrates and fish upon which

they predate. Different plants and animals are evolved to favour different habitats within the river. For example, mayfly (*Ephemera danica*) and brook lamprey (*Lampetra planeri*) prefer silty conditions in slackened flows towards the river margins; flat-headed mayfly (Family Heptageniidae) are adapted to cling to pebbles in faster flows, hence their colloquial name 'stone clinger nymphs'. Wild brown trout, favour areas of slightly slackened flow directly alongside faster currents, ideally with overhead cover nearby. This enables them to conserve energy whilst darting in and out of the faster flow to snap up passing prey. For these reasons, a healthy river system is reliant upon a good diversity of flow patterns and channel widths and depths. Good habitat diversity is also good for anglers as a more rich and diverse river will provide a better abundance and diversity of river flies and provide prolonged periods of good fly fishing.

Figure 3: The river is straightened and overly-uniform in width and depth

Fortunately, the uniformity of the channel is mitigated to a certain extent by occasional fallen willow limbs (*Salix* sp.) which provide excellent cover for trout and introduce some flow deflection and scour. The low, shrubby goat willows (*Salix caprea*) in particular along the LB, ensure that the low and trailing, marginal cover that trout favour is abundant (Figures 4 and 5). These also collect valuable rafts of weed that create further shade and cover for large adult trout. Rather than clearing these rafts to 'tidy' the river, as was historically the practice, such rafts

should be encouraged as an easy way to greatly increase habitat availability and improve the fish carrying capacity of a reach.

There is also an abundance of bankside alders (*Alnus glutinosa*), providing opportunities to introduce valuable large woody habitat features which will also enhance flow diversity and, with time, will scour the bed and introduce variation in depth and create holding lies for trout.

Simply felling a number of large alder limbs into the river, positioning them with the branches downstream at ≤45° from the bank and securing with sweet chestnut stakes and galvanised fencing wire or thick biodegradable twine could greatly enhance the quality of habitat within this reach. Additionally and if possible, alder limbs could be hinged (cutting partially through the back of the trunk and kneeling the limb over in a similar fashion to hedge-laying), so that the limb remains attached to the bank and alive. Hinged limbs are more secure, requiring less effort to fix to the bed and will have a longer life-span in the river.

Another simple technique is to secure logs into the river as flow deflectors. Ideally, these should be of such a diameter that the log is positioned just below water level, forcing the surface water to roll over the log. Water flowing over a log in this fashion will be deflected at 90 degrees from the position of the log so deflectors should be positioned 45° in an upstream direction from the bank. This will ensure that flow is deflected across the channel as opposed to towards the bank. The bankside edge of the deflector should also be thoroughly keyed into the bank to prevent flows cutting around the log and eroding the bank.

Figure 4: Naturally occurring woody habitat features help to diversify conditions

Figure 5: Low-lying, shrubby willows provide excellent bankside cover

The uniformity of the habitat is further compounded by the channel being generally over-wide for its average flows. Shallow, wide points within a river are important features in themselves that provide good habitat for juvenile salmonids and other smaller fish; however, too great a length of wide channel can cause flows to become sluggish.

In this case, sluggish flows have allowed fine, sandy sediment to settle uniformly over the bed throughout much of the channel (Figure 6). This scenario can result in the gravel bed becoming smothered, infiltrated and compacted, making it difficult for salmonids to cut their redds (nests) and significantly reducing the survival rates of eggs and alevins (newly hatched salmonids still carrying their yolk sacks) with the gravel. Eggs and alevins require a constant flow of cool, well-oxygenated water to survive; if the interstices between the gravel grains become smothered with fine sediment, eggs and alevins can quickly suffocate. Deposition of fine sediments can also smother flow loving aquatic vegetation like water crowfoot (*Ranunculus* spp.), greatly reducing its health and abundance.

In some very alkaline watercourses, this problem is often further compounded by the natural precipitation of calcium carbonate minerals (known as 'tufa') which can cement gravels together. Successful spawning and egg/alevin survival is normally the most significant life stage 'bottleneck' acting on trout populations in chalkstreams and so improving spawning habitat can often significantly boost wild trout populations where habitat conditions are good for subsequent life stages.

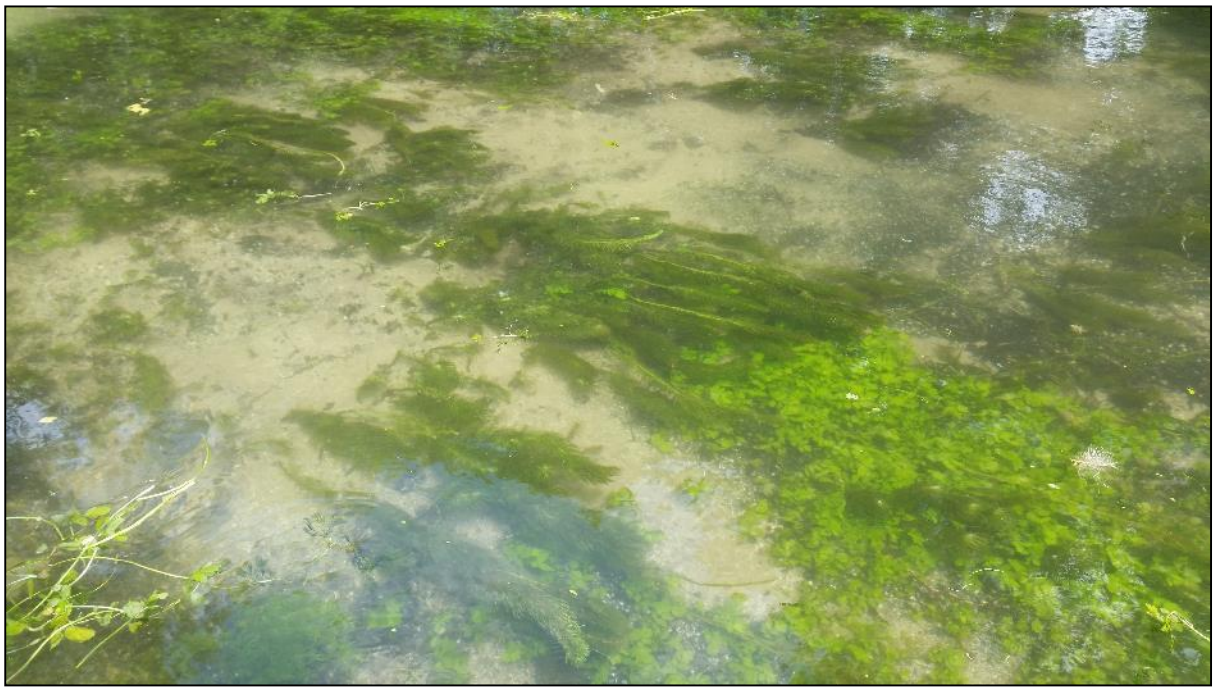

Figure 6: The uniform conditions have caused the bed to become smothered in fine sediment in places.

Introducing woody habitat features will help to enhance flow diversity within the reach, and if positioned correctly, will help mobilise fine sediment from the centre channel and allow it to settle in the margins. The introduction of some occasional pinch-points to locally narrow the river will energise flows and could significantly

enhance this effect. This could be achieved by creating some marginal berms, either from brushwood or with imported flint gravel of the appropriate size for the river. Berms can also be used to introduce sinuosity into the straightened channel.

Access to this section of the river from the Hurstbourne Priors road (B3400) is good and it may be cost-effective to introduce additional gravel into the reach. This could be used to create sloping marginal berms which will provide excellent opportunity for a succession of marginal plants to colonise the margin, and could also be used to create a few short sections of shallow glide or riffle habitat. Shallow glides at the tails of pools are the favoured spawning habitat for trout.

Towards the lower end of the reach upstream of the mill, the banks are densely wooded and the river is over-shaded, inhibiting the growth of both marginal and submerged plants (Figure 7). Achieving the correct balance of light and shade over a river is essential. Too much shade and in-stream productivity can be hindered, too little shade and the river can become choked with encroaching marginal plants or vulnerable to spikes in temperature during periods of prolonged dry, hot weather.

In order for most rivers to remain productive yet protected from temperature which can kill temperature-sensitive species such as trout and mayfly, a rough 50:50 ratio of direct sunlight to dappled shade is recommended. However, in chalkstreams, the mineral rich, gin-clear water provides exceptionally good growing conditions for river plants. It is the abundance and diversity of these plants, and the ecosystem they support, that makes them such important habitats. The present recommended ratio for chalkstreams is approximately 70:30 direct sunlight to dappled shade.

(http://www.asfb.org.uk/wp-content/uploads/2012/09/Keeping-Rivers-Cool_Guidance-Manual_v1.-23.08.12.pdf)

Figure 7: The lower extent of this reach is over-shaded, limiting in-stream productivity

A programme of tree works to create some occasional 'skylights' in the canopy would help to boost in-stream productivity. Allowing light into the river over shallower, narrower (faster-flowing) sections of river will encourage the growth of water crowfoot in particular.

Allowing more light onto the river margins will also help boost the abundance and diversity of emergent vegetation. Marginal plants are a vital component of the chalkstream ecosystem, providing food and habitat for a range of freshwater invertebrates that have life-stages in and out of the water (such as river flies), and for terrestrial invertebrates that invariably drop into the river and supplement fish diets. Such plants also provide excellent 'shaggy' marginal refuge habitat for fry.

When introducing new marginal habitat, for example via the creation of brushwood berms, it is important to consider light conditions and ensure that sufficient direct sunlight is available for the berm to become colonised by marginal plants. This is evidenced where stakes mark out the shape of previous coarse woody structures which have failed to become colonised by marginal plants under the heavy shade of bankside willows (Figure 8).

Figure 8: Past brushwood structures have become over-shaded and have failed to become colonised with marginal plants

Much of the RB along this carrier is retained behind shuttering boards, probably installed in an attempt to protect the footpath from erosion. In places, this is in the process of being replaced with brushwood faggot bundles which will provide much better marginal habitat (Figure 9). However, the density of tree cover makes it very unlikely that the faggots will become colonised and eventually replaced by marginal plants. In one location, brushwood faggots have been covered with gravel (Figure 10). This is a good option for protecting the footpath from erosion whilst also retaining a low-level shelf which will remain in place long-term and also create a saturated transitional habitat that will be colonised by marginal plants where light levels allow.

Figure 9: The wooden shuttering is in the process of being replace with brushwood faggots

Figure 10: Gravel on top of the brushwood provides good long-term transitional habitat and bank protection

At the mill, the river is divided between three carriers. The main carrier takes flow around the mill through a straightened but relatively 'wild' channel. The RB in particular (owned by Mr Maitland) provides some good low cover in the form of low, tailing branches (Figure 11) and low growing shrubs. This reach could be enhanced by taking the opportunity to drop already heavily-leaning tree limbs (Figure 12) into the channel to provide some additional flow deflection and marginal habitat. These will then facilitate areas of increased scour and deposition,

providing valuable variation in channel with and depth. Additional log deflectors positioned to alternate flow laterally across the channel would also greatly improve flow diversity as well as providing some good lies for trout.

Figure 11: Low-growing limbs provide excellent cover and flow deflection

Figure 12: Heavy-leaning trees are at risk of falling into the river. This is an opportunity for habitat enhancement.

The footings of an old sluice (no longer present) have scoured a deep pool at the top of this carrier. Gravel scoured from the pool has been deposited a short distance downstream to form a glide and riffle. This is a good potential spawning

site and folding some of the low-lying branches shown in Figure 11 into the margins of the river to provide some refuge habitat for juvenile trout could boost survival rates.

Figure 13: Low branches (highlighted) could be hinged into the water to provide cover for juvenile trout

The second carrier flows under the mill and out through the gardens of the property. Near the mill, the toe of both banks are retained behind wooden shuttering and marginal habitat is absent. However, after a few metres the management of the riverbank is much more sympathetic and a diverse margin of marginal plants has been allowed to flourish (Figure 14).

Figure 14: A hands-off approach to bank management has allowed a narrow but diverse margin to develop

River weed has been cropped in a bar pattern to facilitate angling or in an attempt to raise summer water levels. Cutting some gaps in the bars to create a checkerboard pattern and leaving weed slightly longer could increase the holding capacity of the stream by increasing the number and quality of individual tout lies. A checkerboard pattern will increase the number of small 'runs' which anglers can target with a dry or wet fly. Leaving weed slightly longer and to a less uniform length will increase the diversity of lies, making for a more varied angling experience. A varied-length checkerboard pattern will also give the river a more natural look without necessarily impeding angling. Creating a wilder fishery that supports natural fish stocks may attract anglers seeking a wild trout fishing experience; something which is relatively rare on the River Test but becoming increasingly popular globally.

The third carrier is a short and narrow stream flowing through the garden which would have once been part of the general operation of the mill. This stream has great potential as a spawning and nursery habitat for wild brown trout. Towards the upstream extent of this carrier a good abundance of marginal cover provides excellent refuge habitat for fry (Figure 15) but the banks of lower part of the stream are confined behind shuttering boards and two small weirs impede fish passage (Figure 16).

The alien invasive plant, monkey flower (*Mimulus guttatus*), was observed (yellow flowers shown on Figure 15). This is not a particularly aggressive alien species but should nonetheless be removed.

Figure 15: Native marginal cover is vital habitat for fry, but the alien, invasive monkey flower (yellow flowers) should be removed

Figure 16: Shuttering and concrete weirs limit habitat quality at the confluence

The weirs are probably passable to most adult trout, especially during winter flows. However, the wide crests of the weirs make the stream less accessible during lower flows and are a significant obstacle for smaller trout to overcome. These

structures should be removed but there is a risk that this action could lead to head-cut bed erosion which would strip out gravel and deepen the channel, reducing its potential as a nursery stream. A re-profiling of the stream post-removal, possibly introducing fresh gravel, may be required. This would make the stream more accessible for smaller fish and also improve its 'attraction flow'. Fish will instinctively follow the flow of greatest momentum (discharge x velocity) when attempting to run upstream. Improving the speed of flow emanating out from the confluence of the small carrier could make it more attractive and improve its potential as a nursery stream for the fishery.

The shuttering should be removed and the banks graded back and planted with marginal plants. This will increase the abundance of cover in the stream and should help boost invertebrate populations.

Conclusions

The fishery at Fullng Mill suffers from many of the issues typical of much of the River Test. Historic channel modifications have created a uniform channel cross section and plan form which limits the abundance and diversity of habitat features. Fortunately, an abundance of bankside trees gives rise to plenty of opportunities to improve flow and habitat diversity within the channel.

Good access from the B3400 means that gravel could be imported into the site relatively cost-effectively and used in combination with brushwood faggots to replace the wooden shuttering along the RB upstream of the mill and possibly used to further improve the diversity of width and depth conditions.

Downstream of the mill, the main carrier could also be enhanced by making use of limbs already at risk of toppling into the river and installing woody habitat features and flow deflectors. The old tail race of the mill is benefitting from a more hands-off approach to marginal vegetation management and could be further enhanced by changing the present weed management regime to create a less uniform, checkerboard pattern with greater variation of weed lengths.
The small garden carrier has good potential as a nursery stream and improving marginal habitat and fish passage could help boost wild trout recruitment.

Recommendations:

In order for the River Test at Fulling Mill to achieve its full potential for biodiversity and good quality habitat, capable of supporting healthy, self-sustaining populations of wild brown trout, the following actions are recommended:

Upstream of the mill

1. A programme of tree works should be initiated to open 'skylights' in the canopies of the most over-shaded parts of the fishery, focussing on letting direct sunlight onto the margins and over shallow, faster-flowing parts of the river.
   After these initial works, the remainder of the bankside trees should be put into a 10 year rotation (coppicing or pollarding 10% of the trees a year) to maintain a diverse pattern of light and shade. This work should, ideally, be undertaken on no more than 1 in 3 trees, to prevent a negative impact upon the habitat quality by creating a uniform size structure.

   www.wildtrout.org/content/how-videos#tree

2. Wood arising from these works should be used to create a variety of in-channel habitat features (see examples in Figures 17 to 20) to deflect flows and provide additional cover habitat and lies.
   Naturally fallen tree limbs should be retained where possible. Pulling fallen limbs in towards the bank and securing with stakes should be considered the primary option. Trimming back branches to facilitate angling is not necessarily detrimental if undertaken lightly but low, trailing branches are vital habitat and should be retained wherever possible.
   The complete removal of these features should be a last resort and only undertaken where angling is made impossible or the fallen limb presents a flood risk or impounds the river.

3. Wooden shuttering should be removed from the riverbank wherever possible and, if necessary, replaced with brushwood faggots secured

against the toe of the bank with sweet-chestnut stakes to create a sinuous margin. Covering the faggots with a sloping bank of imported flint gravel (leaving the brushwood exposed under the water) will help protect the footpath and also provide a saturated transitional habitat that will be colonised with marginal plants where light levels are sufficient.

Figure 17: A log and brushwood berm installed on the Hampshire Avon has become colonised with iris (*Iris pseudacorus*)

Figure 18: An example of a hinged live willow diversifying flows and providing excellent cover and fish refuge

Figure 19: A simple log deflector kicks flow across the channel

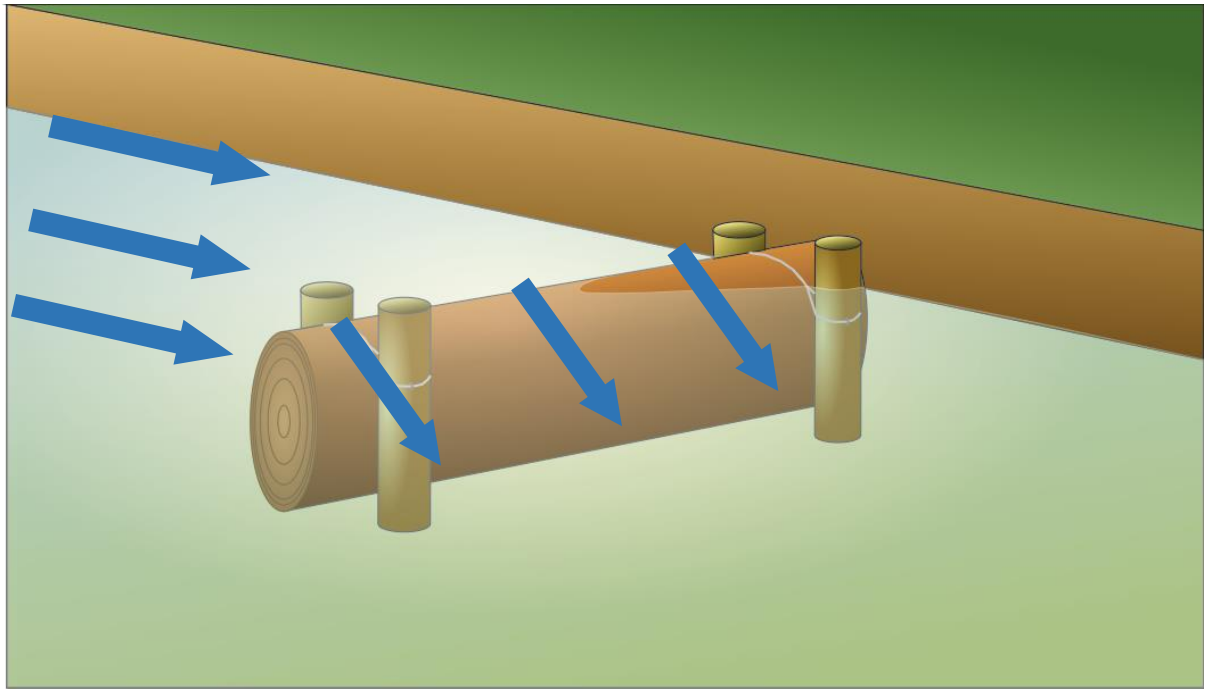

Figure 20: An illustration showing a log deflector secured with sweet chestnut stakes and fencing wire

4. The upstream extent of the fishery, which is frequented by members of the public (Figure 2) might benefit from the installation of a wide berm of gravel. This would form an accessible 'beach' next to the footpath and bench which would create a focal point where local people can enjoy the river. Attempting to completely exclude the public from the river will only result in less regard for the river and may in any case be an almost impossible task. Signage at this location pointing out that this section of the river is for public enjoyment but politely asking people to refrain from entering the river (or allowing dogs to enter the river) may help keep disturbance of fish, wildlife and anglers to a minimum. Displaying information regarding the value of chalkstreams and importance of the River Test as a Site of Special Scientific Interest (SSSI) may facilitate co-operation from the local community in this regard. Tying this sort of public engagement into a wider project could help win funding from public bodies that might otherwise be unwilling to fund improvements on a private fishery.

Main carrier below the mill

5. Take the opportunity to hinge or fell at-risk, leaning limbs into the river in a downstream direction and secure with sweet chestnut stakes. Additional log flow deflectors to diversify flows would also be beneficial.

6. At the old sluice (Figure 13), hinge small bankside limbs into the river to provide refuge for juvenile trout. This technique is similar to hedge-laying (see example Figure 21).

Figure 21: Small limbs 'hedge-laid' into the river and secured with stakes (cut off below water level)

Garden carrier

7. Remove the weirs and monitor head-cut erosion. If required, re-profile the stream plan form and cross section to mitigate against any bed erosion and maximise habitat diversity. Additional gravel may also be required to maintain good spawning habitat.

8. Remove the shuttering boards from the lower part of the stream and grade the banks back. Then plant turfs of marginal plants won from the river nearby into the bank.

Figure 22: An example of gravel introduced into a small stream to create spawning habitat and improve flow diversity

9. Ensure that the quality of the existing gravel bed of the stream is in a good condition. To be viable for spawning the bed should be as free from fine sediment as possible

http://www.wildtrout.org/news/new-how-video-gravel-cleaning

Making It Happen

The creation of any structures within most rivers or within 8m of the channel boundary (which may be the top of the flood-plain in some cases) normally require formal Flood Defence Consent (FDC) from the Environment Agency. This enables the EA to assess possible flood risk, and also any possible ecological impacts. The headwaters of many rivers are not designated as 'Main River', in which case the body responsible for issuing consent will be the Local Authority. In any case, contacting the EA early and informally discussing any proposed works is recommended as a means of efficiently processing an application.

The WTT website library has a wide range of free materials in video and PDF format on habitat management and improvement:

http://www.wildtrout.org/content/index

The Wild Trout Trust has also produced a 70 minute DVD called 'Rivers: Working for Wild Trout' which graphically illustrates the challenges of managing river habitat for wild trout, with examples of good and poor habitat and practical demonstrations of habitat improvement. Additional sections of film cover key topics in greater depth, such as woody debris, enhancing fish stocks and managing invasive species.

The DVD is available to buy for £10.00 from our website shop http://www.wildtrout.org/product/rivers-working-wild-trout-dvd-0 or by calling the WTT office on 02392 570985.

There is also the possibility that the WTT could help via a Practical Visit (PV). PV's typically comprise a 1-3 day visit where WTT Conservation Officers will complete a demonstration plot on the site to be restored.

This enables recipients 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, hopefully leading to successful completion of aims and objectives.

Recipients will be expected to cover travel and accommodation (if required) expenses of the WTT attendees.

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 organisations and landowners through guidance and linking them up with others that have had experience in improving river habitat.

Acknowledgement

The WTT would like to thank the Environment Agency for supporting the advisory and practical visit programme in England, through a partnership funded using rod licence income

Disclaimer

This report is produced for guidance; 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 guidance made in this report.

Appendix 1 – Good Practice Code for Coppicing

Coppicing of riparian trees during the winter is a traditional method of management. This can benefit the river, the farm and the whole catchment area. One of the aims is to increase the amount of light falling on the banks and bed of the river to promote the growth of bankside grasses and aquatic macrophytes and algae. Coppicing should be planned on a minimum of a five to nine year cycle.

1. Before carrying out any coppicing a plan should be drawn up. For this the presence of protected species (including bats and otters) should be determined (see below), and their habitat requirements taken into account.

2. In heavily shaded sections, coppicing should be concentrated in fast flowing shallow 'riffle' areas with lighter work around the glides and pools.

3. Try to leave most of the remaining shading on the south bank along glides.

4. Coppice trees only from November to March and, in any case, well before they come into leaf in the spring.

5. Avoid cutting right back to old growth. Aim to cut to knee height, retaining at least 200mm of new growth. This helps promote good re-growth of the coppice stool.

6. Preferentially leave ivy covered trunks.

7. Leave old and dead trees unless dangerous. Very old or "veteran" trees provide valuable habitat for a variety of wildlife and can contain a rich lichen flora. Some bat species are known to roost under loose bark and in tree holes.

8. Do not take mature timber. It does not coppice well. Any trees with good holes, cavities, splits, or loose bark should be retained.

9. Do not use machinery in the river. There are risks of pollution from fuel, oils and silt associated with use of machinery, which could result in prosecution.

10. Do not damage riverbanks or tree roots with machinery as this may lead to additional erosion. Avoid the use of machinery within 3m of the bank edge or tree stems.

11. Do not work **in** the river between 1 October and 31 March to prevent disturbance to spawning trout, trout eggs and newly hatched fry.

12. Coppiced timber and brash can form valuable habitat for a wide variety of wildlife. Where possible, it should be used to create LWD in the channel, or stacked and secured in such a way as to avoid it washing away and either endangering fences downstream or accumulating on obstructions (bridges etc.) and causing a flood risk. If material cannot be securely stacked then it should be removed from the flood plain completely. Should any material be burnt then this should be done no nearer than 50m to any other tree. In no circumstance should burning take place in the river channel. Ash must not be allowed to enter the watercourse.

13. Leave the stumps in the bank as they help to protect the bank from erosion and provide valuable habitat for fish. Tree roots also provide lying up sites for otters and nest sites for riverine birds such as grey wagtail and dippers.

14. Coppicing should be fenced to prevent damage to new growth from browsing stock.

15. Before working in areas with wildlife designations - Natura 2000 sites, Sites of Special Scientific Interest, National and Local Nature Reserves – you must first consult the relevant authorities, to avoid breaching wildlife legislation.

PROTECTED SPECIES

Many of the animals associated with river corridors (including bats, otters and dormice) are protected under Schedule 5 of the Wildlife and Countryside Act (1981), as amended by the Countryside and Rights of Way Act (2000) (CROW

2000) and The Conservation (Natural Habitats, &c.) Regulations 1994. This now extends the offence in section 9(4) of the 1981 Act to 'subject to the provisions of this Part, if any person intentionally or recklessly kills, injures or takes any wild animal included in Schedule 5, he shall be guilty of an offence.

BATS

All work that may affect bats should be discussed in advance with Natural England as a bat licence is required to survey (licensed consultant/bat worker) or carry out work on roost sites (DEFRA license). Under the Bonn Convention (Agreement on the Conservation of Bats in Europe) the UK is also required to protect their habitats, requiring the identification and protection from damage or disturbance of important feeding areas.

Bank side trees form important habitats for bats, as certain species are dependent on trees. Check trees for signs of bat roosts:

- obvious holes, cavities and splits in trunks and limbs
- dark staining on the tree below a hole
- staining around a hole caused by the natural oils in bats' fur
- tiny scratch marks around the hole from bats' claws
- droppings below a hole - they look similar to those of rodents but crumble to a powder of insect fragments
- noise (squeaking or chittering) coming from a hole
- check holes by inserting a mirror and watching the hole at dawn or dusk
- bats will also roost behind loose bark, which should be checked similarly.

If a roost is identified or suspected a more detailed inspection must be undertaken by someone with the relevant experience and correct license to assess, obtain and implement a DEFRA license where tree roosts will be damaged or lost. Whether bats are found or not, any trees with good holes, cavities, splits, or loose bark

should be retained. An assessment should be made of the impact the work will have on bat roosts, feeding habitats and commuting routes before determining the final coppice plan, which may require alteration to accommodate the requirements of the bats.

OTTERS

Otter holts are found in cavities in large tree root systems, so any work on trees should be preceded by a root inspection. If a holt or resting place is *identified or suspected* a more detailed inspection must be undertaken by someone with relevant experience to ascertain whether otters are present. Coppicing should be carried out so that the coppice cut is taken some height above the stool, to allow for the protection of the cavity. Otter holts are protected by law and a licence may be required if disturbance is likely. All such works should be discussed and agreed with Natural England before proceeding.