River Blackwater, Woodington Fishery

Advisory Visit November 2017

Key Findings

- **This section of the River Blackwater can support a viable fishery that will complement the existing still-water trout fishery on site.**
- **The river does not lend itself to classic chalk stream fishing techniques but could make an interesting mixed fishery, particularly for spring time brown trout and targeting back-end sea trout.**
- **There is significant scope for habitat enhancement that will improve the fish-holding capabilities of the channel.**
- **The reach inspected does not support any significant spawning or nursery habitat. However, this is not an issue for this particular reach of river because there is high quality spawning habitat available a short distance upstream.**
- **Habitat quality will improve once the Himalayan balsam is under control and a marginal fringe allowed to develop.**
- **Stocking is not recommended as a management option.**

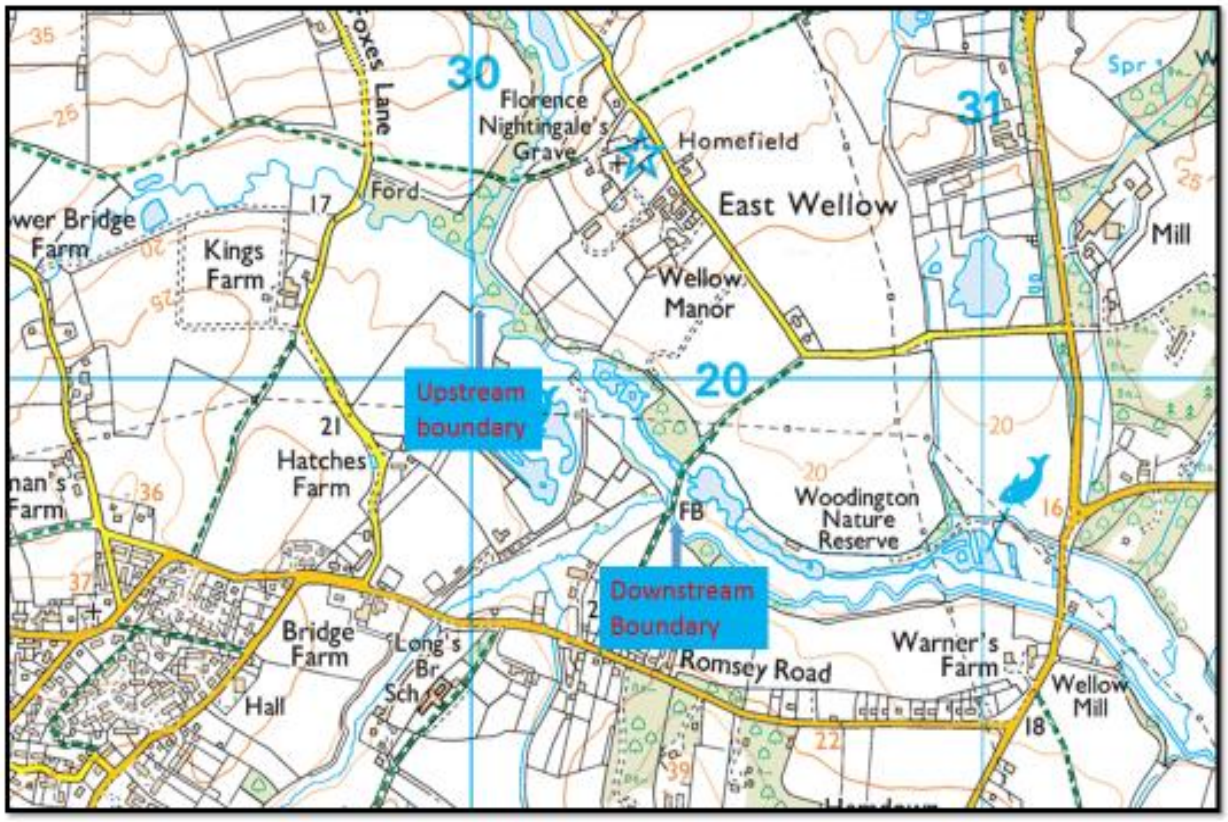
1.0 Introduction

This report is the output of a site visit to a stretch of the River Blackwater located near Wellow, Hampshire. The 0.6km reach of channel inspected runs from National Grid Reference SU 3003120135 down to SU 3039219759. The request for the visit came from Mr. Jim Hoare who has recently purchased the Woodington Fishery, which comprises a section of the river, plus three stillwaters, two of which have been historically managed as "put and take" trout fisheries.

Mr. Hoare is particularly interested in exploring the fishery potential of the river as well as enhancing its nature conservation value.

The Blackwater is classified under the Water Framework Directive as Waterbody ID No. GB107042016791 and is currently assessed as being in good ecological condition.

Comments in this report are based on observations made during the site visit and discussions on the day with Mr Hoare. Normal convention is applied with respect to bank identification, i.e. left bank (LB) or right bank (RB) whilst looking downstream. Upstream and downstream references are often abbreviated to u/s and d/s, respectively, for convenience. The Ordnance Survey National Grid Reference system is used for identifying locations.



Map1. Woodington Fishery. © Streetmap.

River	River Blackwater (Test and Itchen)
Waterbody Name	River Blackwater
Waterbody ID	GB 107042016791
Management Catchment	Test and Itchen
River Basin District	South East
Current Ecological Quality	Good status
U/S Grid Ref inspected	SU 30031200135
D/S Grid Ref inspected	SU 3039219759
Length of river inspected	0.6km

Table 1. Overview of the waterbody. Information sourced from http://environment.data.gov.uk/catchment-planning/WaterBody/GB107042016791

2.0 Catchment Overview

The River Blackwater rises just to the east of Red Lynch, on the northern fringes of the New Forest. From here, it flows south easterly for approximately 16km before joining the River Test at the upstream end of its tidal range. The Test has an international reputation as one of the finest chalk stream fisheries in the world. The Blackwater, by contrast, is not a chalk stream but rises from a network of small, surface-fed streams and gutters running over mainly tertiary clays and gravels. The Blackwater has long been recognised as a crucially important spawning tributary to the main River Test and is thought to be the destination of choice for the bulk of the migratory sea trout (*Salmo trutta*) that enter the system. Unlike the River Test, the Blackwater does not enjoy any high level statutory protection as a Site of Special Scientific Interest (SSSI).

Hampshire is widely regarded as a mecca for trout anglers, due to the world famous chalk stream fisheries that support exceptionally good populations of larger than average brown trout. The Blackwater is not a 'base rich' chalk stream but a mildly acidic spate river. Spate rivers are noted for having big variations in flow with a rapid response to rainfall, and are not inherently stable like chalk streams which are fed largely from groundwater. They are often naturally low in dissolved nutrients and trout in such rivers can often be numerous but of a small average size. A proportion of the trout residing in streams like the Blackwater have developed a life strategy that relies on a migration to sea to feed and grow before returning to spawn. This anadromous lifestyle allows them to reach a size

that will produce a large number of eggs and therefore give the population a better chance of success (sea trout are often predominantly hen fish and will mate with much smaller males, including small resident brown trout). Fish that leave the Blackwater after two or three years as 4 to 6 inch trout smolts, spend one to three years at sea before returning as adult sea trout.

It is highly likely that a large proportion of the trout that are naturally produced in the Blackwater system will eventually migrate to sea. Smolt migrations generally take place at night during April, and sea trout may return at any time during the late summer and autumn to spawn in the winter period, usually from mid-November to mid-January.

The Blackwater supports conservation designated species such as bullhead (*Cottus gobio*) and brook lamprey (*Lampetra planeri*) as well as healthy populations of trout. The fish fauna also includes eel (*Anguilla anguilla*), which have seen stocks diminished in line with a Europe-wide crash in numbers and a modest population of grayling (*Thymallus thymallus*) and various other coarse fish species, some of which are thought to be escapees from the network of stocked stillwater fisheries that are dotted throughout the valley. Recruitment of flow loving coarse fish species occurs in the lower reaches of the river (Ref: Environment Agency SSD Fish Monitoring Report 2012).

3.0 Habitat Assessment.

The section of the Blackwater at Woodington is set within a deeply incised channel. It is highly likely the river was historically dredged during the middle to latter half of the last century. A significant plus point is the fact that the channel still has a meandering planform, supporting attractive deeper pool habitats, some with valuable overhanging tree cover, located mainly on the outside of meander bends (photo 1).

The variation in flow patterns promoted by the diverse shape of the channel does help to create opportunities for fish to tuck themselves out of the main flow without expending too much energy. Food items carried in the flow can be picked off by fish that position themselves in areas where there is a collision between these varied flow patterns. A key habitat component which helps to maintain this flow pattern diversity is woody material, or trailing branches. In addition to the cover from predators that is afforded by woody material, it will also help to create attractive lies for certain fish species, in particular fish like trout and chub.

Between the meander bends, the river is characterised by smooth laminar glide habitat flowing over a comparatively flat river bed consisting of mainly fine sediments. Towards the middle reaches of the beat, the channel has very sparse tree cover and little in the way of low-level shading (cover photo). Where the river is sufficiently shallow, there was evidence of some submerged weed beds (photo 2) which looked to be mainly comprised of water crowfoot (*Ranunculus* sp). This valuable plant demands a firm river bed and plenty of light and although the channel was too turbid to be able to properly inspect the river bed,

it is assumed that some sections have a firm bed made up of unsorted gravels, possibly with a thin layer of fine sediments on top.

Photo 1. Double bend supporting well covered pool habitat.

A substantial length of both banks are currently subjected to a close-crop mowing regime, with little or no developed marginal fringe, or established bank toe present (photo 3). It is understood that the current maintenance regime has been undertaken to control invasive Himalayan balsam. Although there were no signs of any serious bank erosion, steep banks with poorly vegetated slopes and tops are more likely to erode and fail. In other areas, the margins are dominated by dense nettle which suggests nutrient enrichment, possibly as a result of previous annual cutting and composting. To reduce the density of nettle and to encourage a more diverse range of plants, cutting and raking off the nettle is recommended.

Photo 2. Beds of submerged water crowfoot providing valuable in-channel habitat for invertebrates and cover for fish.

Scruffy river margins with trailing dead and dying plants in the winter months may look untidy but can, when left to over-hang the margins, provide important cover. Once the Himalayan balsam is under control it is recommended to allow the fringe to develop. A scruffy margin with trailing plants provides essential habitat for invertebrates and cover for fish, as well as the promotion of well-developed root systems that can help to tie-in the bank soils and prevent bank slippage.

Several coppiced alder trunks have also received close attention (photo 4). Striking a balance to ensure some light reaches the centre of the channel but at the same time maintaining low scrubby cover in the margins is the key to building improved wild fish stocks within this reach of river.

Photo 3. Both margins tightly strimmed and mowed due to invasive balsam dominating the flora.

Photo 4. The low branches removed from this Alder trunk would have enhanced the fish holding capacity of this potentially attractive lie.

Photo 5. Section of bank dominated by nettles. Heavy nettle growth is more desirable than close-cropped grass but cutting and raking off nettle on top of the bank will help to promote a more diverse plant flora.

Some good examples of where to carry out bankside maintenance are depicted in photos 6 and 7 below. The thin, leggy ash tree in photo 6 could be coppiced because it doesn't have the capacity to provide low-level marginal cover, whereas the low scrubby cover developing on what looks to be an alder stump (photo 7) should be allowed to develop further to create a valuable holding area for fish.

Photo 6. This thin leggy ash tree could be coppiced if it is deemed to interfere with angling and also because it will not develop into valuable low-level, marginal shading.

Photo 7. This old stump is starting to sprout multiple stems which if left to develop will create valuable cover.

Towards the downstream end of the beat there is the remains of a low stone weir structure (photo 8). It is unclear what purpose the weir served but it is possible it was constructed to maintain a head of water for the pump house, which is located a short distance upstream. Low stone weirs are often found on rivers and many were constructed as "summer" weirs to maintain a deeper head of water, usually for angling following droughts, or were sometimes built for

ornamental purposes. Unfortunately, these structures also invariably interrupt sediment transport, with the net result of the section upstream of the structure becoming an area of serious sediment deposition. In a comparatively short period of time, any advantages in creating deeper water up-stream of the structure are lost as the bed levels slowly rise over time.

Photo 8. Remains of an old stone weir structure

Removing the central third of the structure will create a narrow flume running through the central third of the channel and facilitate improved sediment transport, as well as promoting downstream bed scour. Settled sediments should be swept away from the river bed immediately upstream of the weir and this may also help water crowfoot to become established and render the reach much more attractive for flow-loving fish species.

4.0 Stocking

A discussion was had regarding the merits, or otherwise, of stocking this section of the Blackwater with hatchery-reared brown trout.

The Blackwater does support excellent numbers of wild trout although it is thought that the majority of the wild trout born in the Blackwater are destined to become sea trout. Whilst many clubs and commercial fisheries still do stock streams with domesticated farm-reared fish, increasingly more clubs and syndicates are realising the benefits of investing in better habitat management and a cessation of stocking, to see increasing numbers of wild trout repopulating the river.

Fishing for wild fish in a wild environment is considered by most to be more rewarding than catching stocked fish in a linear stew pond. With the presence of a stocked still-water fishery on site, the addition of a truly wild fishery to the fishery portfolio provides a challenging and interesting alternative for visiting rods.

The following text has been pulled together by my colleague Gareth Pedley and encompasses many of the issues associated with trout stocking which may help with any decision-making process:

The native trout populations of Britain possess great genetic diversity, being the product of several separate colonisations following the last ice age. Many are now further distinct from each other, having adapted to their local environments over time. The natural genetic variability of these populations makes them amazingly resilient and adaptable to changing environmental conditions, which they should continue to do providing human impacts upon them and their habitats can be limited.

However, over the last 150 years, human impacts upon fish populations has increased exponentially, with major issues arising from the way in which we manage land and rivers. To compound these issues, direct interference with wild fish populations also increased, with large numbers of hatchery bred fish being introduced to rivers.

The artificial mating that occurs within hatcheries bypasses vital chemical and visual aspects of mate selection; a process that exists to ensure mate compatibility and maximises the fitness of wild fish. Stocked fish (both diploid and triploid), are also affected by domestication and natural selection for the farm environment, even within one generation in the hatchery (so this includes fish from wild brood-stock schemes). After all, farmed fish are the individuals that have survived within a concrete raceway, earth pond or tank etc. and are therefore poorly adapted for the very different conditions of a natural river. Adaptation to a farm environment is cumulative, with genetic diversity, natural behaviours, and survival rates when released to the wild all decreasing with each generation in captivity.

Stocking fish therefore produces a *'no-win'* situation: if they don't successfully reproduce in the wild, or are infertile (triploids), they are simply a negative impact upon the ecosystem; if they do survive long enough to breed, their offspring have much poorer survival than the offspring of wild fish. However, stocked fish do still temporarily take up space and resource within a river that could have been used by wild fish. Naïve stocked fish also make an easy target for predators, potentially increasing predator survival rates, attracting greater densities of predators, and increasing the negative impact they have on a river.

So, what is the other option?

Natural rivers (without stocking) have a far greater capacity to produce and hold healthy fish populations. As stated, they were successfully producing an abundance of fish for a long time before we started interfering.

A major key to the success of wild salmonids is their life strategy: over-production of offspring that are then subject to density-dependent mortality. The greater the habitat availability in any year, the greater the number of trout that will survive, thereby mitigating for mortalities and annual fluctuations in the population. This also means that populations can be easily increased by improving habitat quality.

As soon as they emerge from the gravel, trout fry disperse throughout the available habitat, constantly competing to maintain territories. This ensures that the fittest, dominant fish control the best lies, with easy feeding for low energy expenditure. They will then remain there until they challenge for a new territory or are displaced by a more dominant individual. Wild fish production therefore ensures habitat is fully utilised and a river holds the optimal number of fish, with the available space being naturally repopulated each year. Such efficient habitat utilisation is impossible to achieve through artificial stocking or alongside stocking, because stocked fish disrupt the wild population structure and hierarchies.

Wild fish constantly defend their adopted territory and strive to stay within it, while stocked fish have little affinity or suitability to the arbitrary reach in which they are stocked. A large proportion of fish stocked into rivers therefore leave the stocking location or lose condition and die within a short time (particularly during high flows). Consider where the thousands of fish previously stocked into fisheries are at the beginning of each season and why there is even a requirement to restock. In contrast, un-stocked wild fisheries provide some of the best fishing early season, as the fish take advantage of early-season hatches to regain condition after the winter.

Consequently, most angling clubs actually report increased catches after ceasing stocking, as demonstrated by the ever-increasing number of case studies on the WTT website - www.wildtrout.org/content/trout-stocking. There is sometimes a lag period as the wild fish population begins to recover but increased catches of juvenile trout and grayling are often reported from year one. Anecdotal evidence from an increasing number of fisheries also suggests that grayling stocks (where present) proliferate once stocking ceases.

An excellent video produced by Wild Fish Conservancy North West documents how the state of Montana in North America ceased stocking after realising the major negative impact it was having – www.youtube.com/watch?v=U_rjouN65-Q&app=desktop

5.0 Conclusion

Turbid river conditions on the day unfortunately made it impossible to make a full assessment of habitat quality, particularly with regard to spawning opportunities. It was noted that a small tributary entered the reach from the RB near to the bottom boundary. This stream runs off the Forest and looked typical of the shallow, gravelly streams that are synonymous with the New Forest and which provide numerous opportunities for trout on spawning migrations.

There were no obvious areas on the main channel supporting high quality spawning and nursery habitat, however, for an individual fishery this need not be of concern provided there is good quality spawning habitat available upstream, which we know exists on both the main channel and numerous small tributaries.

There is no doubt that the reach has significant potential as a holding habitat for both resident brown and migratory sea trout. These potential holding areas could be significantly enhanced through a slightly more relaxed approach to river margin maintenance. Providing additional low, water-level shading, through a combination of reduced trimming and possibly further tree planting, particularly into the toe, rather than on top of the bank, with low scrubby trees such as goat willow (*Salix caprea*), elder (*Sambucus nigra*) and thorn species can provide valuable low cover without shading the whole channel.

Reducing the impounding effects of the low stone weir will also create slightly faster flowing and shallower water in the reach above. Further improvements to habitat quality can then be created by using strategically placed large woody flow deflectors. These would work very well on this stream due to the high energy that is created during spate conditions. These woody structures will help to create much needed diversity in the shape of the river bed by locally scouring deeper pools and sorting of bed sediments.

Woody flow deflectors must be securely fixed to the river bed and should be keyed into the banks to avoid any bank erosion. Erosion is always at right angles to the deflector so they should also be configured pointing upstream to promote mid-channel bed scour, rather than downstream where they are more likely to blow out the bank. An example of a typical tree trunk deflector is depicted in photo 9, in this case secured with a combination of chestnut clefts and galvanised wire, as well as 18mm steel rebar on the outer edge. Flow deflectors should typically pinch the channel by at least a third of the existing channel width to be really effective. The example depicted is a little more radical but is located in a low risk environment. More information about the value and use of woody flow deflectors can be found on the WTT website at http://www.wildtrout.org/content/how-videos

Photo 9. Typical tree trunk deflector designed to create local bed scour and sorting of bed sediments. This stream is flowing from left to right of shot.

In reality, this reach of the Blackwater would best be managed as an "any method" fishery, rather than purely a fly fishery targeted at brown trout. There is no doubt the river would perform in the spring and early summer for small brown trout with the fly rod but catching late summer, or early autumn sea trout on the fly would be challenging though definitely possible.

Perhaps allowing some trusted rods to also have access for late season sea trout fishing with light spinning gear will enable the full potential of the fishery to be realised. There is no reason why this method shouldn't be carried out with single, barbless hooks to allow effective "catch and release". There is published research which suggests that trout mortality rates are higher when using bait.

A brief discussion was had regarding how anglers might access the fishery. The high nature of the banks will make classic chalk stream style bank fly fishing extremely difficult and probably very unproductive. Bank fishing in a few locations is possible but would be extremely challenging. In many ways, fly fishing via wading would give anglers a much better chance of success. There may be some sections that are too deep to wade safely but the majority of the reach could be easily accessed via upstream wading in chest waders.

Safe access is an issue but all that is required is to create a handful of entry and exit points, with a simple notch or two cut into the bank for a foothold and possibly a knotted rope, either secured to an existing tree trunk, or fastened to a driven post to aid safe entry and exit. An advantage in encouraging wading,

rather than bank fishing, is that there is a reduced requirement for riparian maintenance and further opportunities for allowing high quality cover to develop.

A short section of small stream such as this will not withstand intensive angling pressure and for the stream to perform it will require low-key angling effort, with perhaps angling restricted to a few days a week on a strictly catch & release basis.

6.0 Recommendations

- Take a more relaxed approach to managing the margins once the balsam is under control.

- Target non-native balsam and nettle on bank faces and tops and attempt to encourage a more diverse flora, as well as allowing a thick marginal fringe of cover to develop.

- Retain as much brash and brushwood in marginal zones as possible.

- Remove the central third of the downstream weir structure to bed level.

- Create more channel diversity by installing a few large woody flow deflectors secured into the margins on shallow, uniform glides.

- Consider planting some low bushy trees into the toe of the bank on some of the more open sections, particularly on the outside of any meander bends

- If fishing is to take place, encourage the rods to fly fish via wading and fish "catch and release" with barbless hooks.

- Angling activity should be "low-key" with regular rest days on a weekly basis.

- Possibly allow "any method" fishing from August onwards to potentially tap into any sea trout opportunities. Rods targeting sea trout should have the appropriate migratory rod licence and still be encouraged to "catch and release" any fish caught. In reality, the best time of year to target sea trout here will be late season following a spate in September or October.

- A trout stocking programme is not recommended.

7.0 Making it Happen

The WTT can provide further assistance to help implement the above recommendations. This includes help in preparing a project proposal with more detailed information on design, costs and information required for obtaining consents to carry out the works. If required, a practical visit can be arranged to demonstrate habitat improvement techniques. Demand for these services is currently high but the WTT is able to provide further advice and information as

required. Further advice on fund-raising can be found at www.wildtrout.org/content/project-funding

We have 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 www.wildtrout.org/product/rivers-working-wild-trout-dvd-0 or by calling the WTT office on 02392 570985.

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

8. Acknowledgement

The Wild Trout Trust would like to thank the Environment Agency for their continued support of the advisory visit service which is supported by funding from rod licence sales.

9. 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.