River Rother – Durleighmarsh

Advisory Visit November 2017

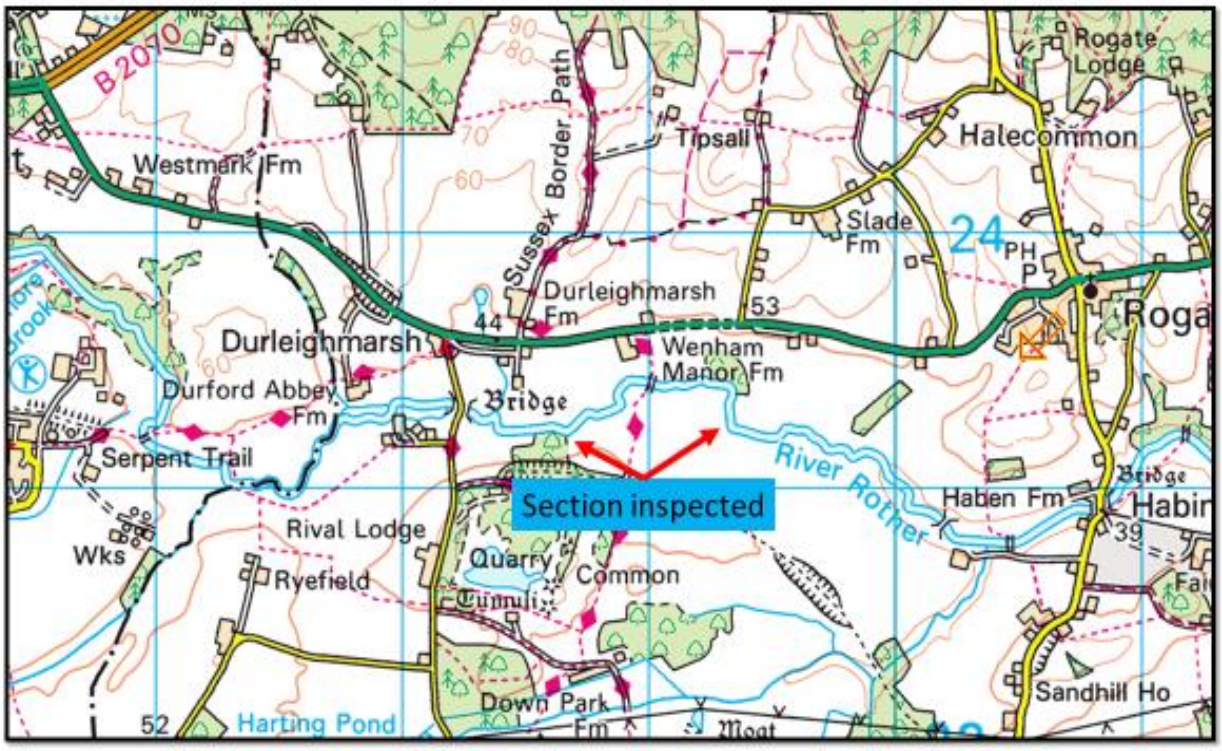
Key Findings

- **This section of the Rother has the potential to provide a more interesting and diverse fishery.**
- **Tree management (both coppicing and planting) is required.**
- **Dividing the beat into "wild" and "stocked" reaches is recommended.**
- **A review of stocking policy is required.**
- **Improved angling access incorporating enhanced habitat quality is achievable.**
- **Water quality checks via invertebrate monitoring is recommended.**

1.0 Introduction

This report is the output of a site visit to the Wenham Manor fishery on the Western Rother at Durleighmarsh near Petersfield. This fishery was the subject of a Wild Trout Trust Advisory Visit back in 2008, however, the syndicate committee are keen to review their management plans. Of particular interest to the syndicate is whether or not there are additional actions they should be taking to improve the habitat quality with a view to enhancing the fishery. The syndicate's current brown trout (*salmo trutta*) stocking programme was also discussed and is explored in more detail section 4. Trout Stocking.

Comments in this report are based on observations made during the site visit and discussions on the day with Mr. Simon Ward and Mr. Roger Mowll from the syndicate and Mr. Ed Eley, Assistant Conservation Officer with the WTT. 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. River Rother. © streetmap

River	Western Rother
Waterbody Name	Rother Durford
Waterbody ID	GB 107041012800
Management Catchment	Arun and Western Streams
River Basin District	South East
Current Ecological Quality	Moderate Status
U/S Grid Ref inspected	SU 7868323199
D/S Grid Ref inspected	SU 7934823283
Length of river inspected	1.0km

Table 1. Overview of the waterbody. Information sourced from

http://environment.data.gov.uk/catchment-planning/WaterBody/GB107041012800

2.0 Catchment Overview

The Rother (Waterbody ID 107041012840) has been assessed as being in 'moderate status' under the Water Framework Directive although the river is known to be both over abstracted and over licensed for abstraction under the EA's Catchment Abstraction Management Plan. The middle and lower Rother are failing WFD targets for siltation pressures and impoverished fish communities. The WFD assessment process for the upper Rother does not reflect the fact that the local trout population is performing well but usually only where suitable habitat is found.

The Western Rother is the main tributary of the River Arun and rises from the chalk hanger near Hawkley. The Rother is augmented by a number of small streams that percolate from springs rising from the chalk to the west and south, as well as springs that rise from the greensand ridge to the north. The Rother then flows due east to join the Arun at Hardham at the head of the tidal river.

Much of the Rother is characterised by a soft sand substrate, a function of the local greensand geology. River bed gravels are relatively scarce here. Those that are present tend to be derived from two principle sources: either from broken outcrops of sandstone, or from the small quantities of flint that have eroded from the streams that drain the chalk slopes. Although strong populations of wild brown trout are to be found upstream of Petersfield, generally low densities of

both trout and coarse fish are found through the middle reaches, where the bed substrate is quite soft and habitat relatively uniform. However, localised sections that possess a firmer substrate and more varied habitat support better fish populations.

The Rother supports a good population of migratory sea trout which run the lower and middle river and tend to spawn in small tributaries. Access all the way upstream to Petersfield is extremely difficult as numerous weirs and milling structures block and delay migration. Some fish have been reported as far upstream as Sheet following a high-flow autumn.

Water quality is generally good, particularly above Petersfield. Occasional pollution incidents have been reported in the area, with several pollution events impacting on the Tilmore Brook, which drains the centre of the town and enters the Rother only a kilometre or so upstream of the Wenham Manor fishery.

The river suffers periodically from low flows, and the intensive nature of the local agricultural land-use downstream of Petersfield can put enormous pressure on the river. Large quantities of water are removed for spray irrigation and intensive arable and salad crop production has led to concerns over increased siltation derived from finely tilled soils in the flood plain and surrounding valley slopes. The huge quantities of fine sediment finding their way into the Rother are thought to be compounded by intense rainfall events, which appear to becoming more regular over the last few decades.

3.0 Habitat Assessment.

At the time of the site visit, river flows were high and the river was carrying significant colour following heavy rain, making any accurate assessment of the quality of the river bed extremely difficult.

This section of the Western Rother is typical of the middle reaches of the river, set within a deeply incised channel lined by soft, friable river banks. Most of the important in-channel cover for trout is provided by the root systems of river-side trees, such as Alder (*Alnus glutinosa)* and goat willows (*Salix caprea)*, which are found mainly on the upper and lower sections of the beat (photo 1).

The central section (cover photo) is lacking in trees and the cover associated with complex root systems. As the first 100m or so of channel upstream of the access bridge flows adjacent to a private property bordering the LB, the scope for tree planting might be limited. If permissions can be secured, planting some bushy tree species, such as goat willow, or hawthorn (*Crataegus monogyna)* into the toe (just above mean water level) of the bank could create valuable low shaggy cover. This is especially important over pools and on the outside of bends and will provide high quality lies for trout, both wild and stocked.

It is understood that in the summer months the shallow reaches on this central section supports submerged weed growth, which would typically be submerged ribbon weeds such as burr reed (*Sparganium sp),* with clumps of starwort (*Callitriche sp)* and occasional beds of water crowfoot (*Ranunculus sp)* in sections where the bed is firm and flow velocities vigorous. Maintaining plenty of sun light to these comparatively rare shallow sections will help submerged plants

to become established. The weed itself is critically important in providing habitat for a range of invertebrate species, as well as proving in-stream refuge for a range of fish species of all life stages. Sections of river bed that are dominated by thick layers of soft, shifting sand will make it difficult for rooted plants to become established. This to some extent is a natural problem for the river Rother and is linked with its geology, however, the sand burden is exacerbated by local land use issues.

Additional cover is available in those areas where fallen woody material has either formed into stable debris dams or where tall, leggy alders have partially fallen into the channel (photo 2). Sensitively managing these trees, particularly near the upstream boundary of the fishery will be important in helping to develop the wild component of the trout population.

Photo 1. An overhanging goat willow upstream of a thorn bush with a super trout lie in between.

Since my last visit in 2008 it would appear that the access bridge has been rebuilt (photo 4.) The design of the bridge is not particularly "river" friendly with an unnecessarily long section of vertical sheet steel piling running upstream of the bridge. Vertical piled banks are a hostile environment for many species of plants bugs and fish and measures to soften the face of the steel to make a more biologically friendly environment is recommended.

Ideally river bridges should have a clear span, providing continuous natural river margins which would normally provide improved opportunities for mammal migration. Areas of bank defended using techniques that help to retain a soft natural bank provide at least some habitat opportunities. On a more positive note, the bridge abutments do act as a hydraulic flume (photo 5) and helps to maintain a large downstream pool that will be attractive to adult trout. It should

be noted that even a large complex pool will still only hold a handful of adult trout, due to their territorial nature. Stocking with large numbers of fish into these attractive areas where angler access is easy will not necessarily result in improved catch rates and could result in a poor return against any investment.

Photo 2. Partially collapsed alder tree in need of coppicing to preserve the tree and the root valuable root systems below the surface.

Photo 3. Another valuable tree providing low, complex cover. Only very light trimming is required to main the combination of fishable access and the retention of a high quality trout lie.

Photo 4. Installing new natural toe to the bank in front of the existing piling will help to offset the negative impacts of vertical steel piling.

Photo 5. The high energy flume which maintains the scour pool downstream of the access bridge

4.0 Stocking

Whilst many land owners, clubs and commercial fisheries still do stock rivers and streams with domesticated farm-reared fish, increasingly more fishery managers are realising the benefits of investing in better habitat management and a reduction or cessation of stocking, to see increasing numbers of wild trout repopulating the river. Fishing for wild fish in a wild environment is infinitely more rewarding than catching stocked fish but there is no doubt it can be a challenge for some, particularly on a river like the Western Rother where wading can be challenging.

The following text has been pulled together by my colleague Gareth Pedley and encompasses many of the issues associated with trout stocking which impact on wild trout and 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.
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> However, over the last 150 years, human impacts upon fish populations have increased exponentially, with major issues arising from the way in which we manage our land and rivers. To compound these issues, direct interference with wild fish populations has also increased, with large numbers of hatchery-bred fish being introduced to rivers.
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> 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-dependant 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 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 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

If trout stocking is to continue at Wenham Manor then it is recommended that perhaps the Syndicate should experiment with the stock densities and frequency of introduction to try and work out an optimal stocking policy. Working out the ratio of catches to the number of fish stocked is critically important for any fishery manager and all rods should be recording the number of fish caught, returned, or killed to enable a detailed catch analysis to be worked up at the end of each season. In well managed stocked fisheries anglers can be expected to catch in excess of 80% of the fish introduced. If the rods are catching less than 20% then it suggests that the fisheries management policies need to be reviewed.

Many factors will influence catch returns, including river flows (at the time of introduction), adult trout habitat, fishing effort, catch and release, individual angler effort, which is also influenced by weather and the competence of the individual rods. The aim of the exercise is to build up a picture of how both stocked and wild fish respond to the policy so that the rods enjoy top quality sport that also ensures value for money. There are a number of case studies on our website which clearly describe angler's catches increasing against a backdrop of reduced stocking.

There are a number of factors to consider when stocking domesticated trout into rivers. The Rother in the early spring will be a comparatively hostile environment, with limited food availability. Even when natural food is readily available, domesticated stocked fish are not always well adapted enough to efficiently exploit it. When stocked too early, or in high densities, domesticated farm-reared fish will either flea downstream, or simply lose condition and/or die.

To maximise catch efficiency and minimise waste and damage to wild stocks it is recommended that stocking should be "little and often" rather than with one or two drops a season. Efforts should be made to spread the stocked fish out, trickling two or three at the most into any likely looking pool. Even at these densities, fish will still be displaced through competition for high quality lies. Shallow, pacey reaches are best left un-stocked, as these will be more attractive for wild fish and can be difficult environments for fish reared in benign stew ponds.

Many anglers these days return their catch, including stocked fish. Returning a stocked fish to be later caught by another rod will obviously boost the catch return but ideally all stocked fish should be killed before the end of the season. Some clubs are now introducing mandatory "catch and kill" for stocked fish in

September and October to ensure that there is less competition for wild fish approaching the crucial spawning time.

To build a more interesting and vibrant fishery on the Rother it will be essential to return all wild fish alive. Many clubs these days have their stocked fish marked or tagged so that rods can easily distinguish between a wild fish, and one that can be taken for the pot.

5.0 Conclusion

All of the comments and recommendations put forward in the 2008 report are still valid today. The fishery at Wenham Manor could be significantly enhanced through a programme of habitat enhancement work. Changes to the syndicates stocking programme and possibly a review of how the rods access their fishing might also lead to a more sustainable and interesting fishery.

Currently significant sections of the beat located at either end of the fishery are probably rarely fished by the majority of the group. The central section offers the easiest opportunities for bank-side fly fishing but even here, covering a fish from the top of the bank is always going to be difficult. Perhaps easier access areas could be created at key holding pools in the 200m of bank running either side of the access bridge. This might be considered as "the stocked" reach, leaving the remainder of the fishery left un-stocked and where wild fish habitats could be developed for the more adventurous rods that might be looking for a more challenging experience.

Improved adult trout holding habitat within the central reach should also be undertaken to ensure that fish that are stocked are encouraged to hold station. Strategic planting of low scrubby tree cover just upstream of a low shelf ideal for angler access would create improved opportunities both for fish and angling.

In areas where the soft banks have failed and collapsed (photo 6), it is recommended to plant up the toe of bank to potentially stabilise the banks. This will help to create a marginal habitat and also a safe, low vantage point for fishing.

Sometimes these "slumped" margins naturally vegetate but on the Rother, where the banks can be pure sand, plants either need to have their roots in wet sand, contiguous with river levels, or have a supporting matrix such as a brushwood mattress to help support them in their early stages of development.

Live willow can be used successfully to halt erosion but will need regular maintenance and may not be desirable in areas where angling access is required. An alternative here might be root wads of local native emergent aquatic plants such as sedge (*Carex sp*), sweet grass (*Glyceria maxima*), reed canary grass (*Phalaris sp*) of emergent burr reeds (*Sparganium erectum*). It is essential that all these plants have their roots permanently wet. These low fringes of emergent plants are rare on the Rother but they do exist and can provide excellent bank protection, as well as crucially important habitat, especially for the adult phases of aquatic insects. They can also provide an ideal front cover for a fishing margin. The toe of the bank will require access to direct sun light for planting to be successful.

Photo 6. A section of typical Rother bank failure, in this case caused by a fallen tree opposite. These low, exposed areas can be stabilised with rooted plants to form a low, natural margin rather than a sandy cliff.

In areas where the channel is shallower the river is likely to be more suitable for supporting wild trout. Improved angling opportunities can be expected for the angler prepared to wade. Creating a few areas where the more active and adventurous rods can slip into the channel in chest waders will help them access areas where bank fishing is virtually impossible. Cutting a few steps into the bank, or strategically deploying rope ladders, secured with driven stakes during the season can help anglers safely clamber in and out of the channel. This type of angling won't be for every member but can provide an effective and interesting alternative to creating difficult bank fishing opportunities and give the rods access to areas favoured by wild trout.

Effective management of the trees and woody material at either end of the fishery will help to create improved habitats for fish and opportunities for the rods. It is essential to retain as much fallen woody material as possible so the key message is to "move it but don't remove it". Woody material can be configured and secured to help maintain diversity in the shape of the river bed and create habitat opportunities for trout of all life stages. Some coppicing of alder trees, particularly those that might be "leggy" or showing signs of disease will help to preserve valuable root systems and also allow in extra light to the channel. The WTT can help with a Practical Visit to demonstrate how these techniques can be successfully employed.

Water quality is likely to be reasonably good at this location but because the fishery is only a short distance downstream of Petersfield Waste Water Treatment Works it would make sense to keep a close eye on effluent quality. A watching brief can be made via periodic surveys of aquatic invertebrates using the kick/sweep sampling technique. More information and training is available via the River Fly Partnership www.riverflies.org . It is understood that the South Downs National Park Authority are keen to help train and recruit volunteers.

6.0 Recommendations

- Consider planting some low scrubby tree species in the central section of the beat to create improved holding opportunities for adult trout.

- Coppice out clumps of trees that are heavily shading the channel to win more sunlight, especially adjacent to shallow runs near the top end of the beat.

- Move and secure fallen large woody material to encourage more diverse pool and run habitat to develop. Consider coppicing marginal trees to win material for pinning into the channel. The WTT can help with a training day via a WTT Practical Visit (PV).

- Retain as much brash and brushwood in marginal zones as possible. Scruffy margins are an essential component of trout habitat.

- Encourage the rods to record all catches and revue fishery performance annually.

- Review the trout stocking programme. Reduced stocking densities may well lead to improved catch rates. Stocking with lower densities but more frequently will result in a better catch return for the same total number of fish stocked and put less pressure on wild stocks.

- Make sure the rods can distinguish between stocked fish and large wild trout. "catch and release" for wild trout will be essential to help build the wild component of the stock. Stocking with rainbow trout (*Oncorhynchus mykiss*) might be an option worth considering but the EA will only consent their stocking where there is an existing record of their introduction.

- Consider dividing the fishery up into "wild wading beats" with no stocking and easier stocked beats but with improved trout holding habitat and access where the older members can still enjoy the fishery.

- Experiment with bank protection measures via planting to create some sustainable low-level margins. Concentrate on areas which receive direct sun light.

- Consider monitoring water quality via invertebrate surveys.

- Note that before undertaking works, Environmental Permits may be required from the Environment Agency.

7.0 Making it Happen

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.

7. 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.

8. 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.