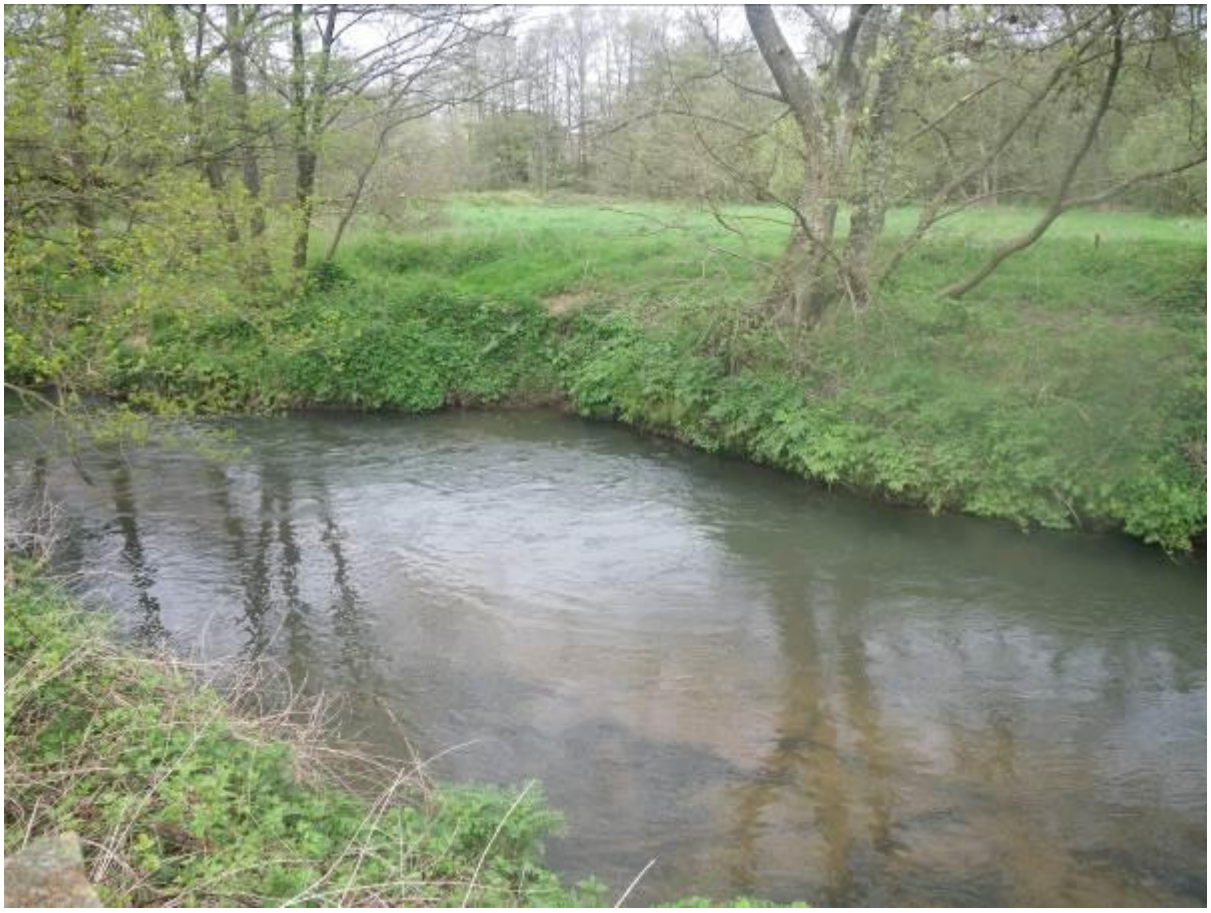
River Rother – Fair Oak Estate – Habin to Trotton



Advisory Visit April 2018

Key Findings

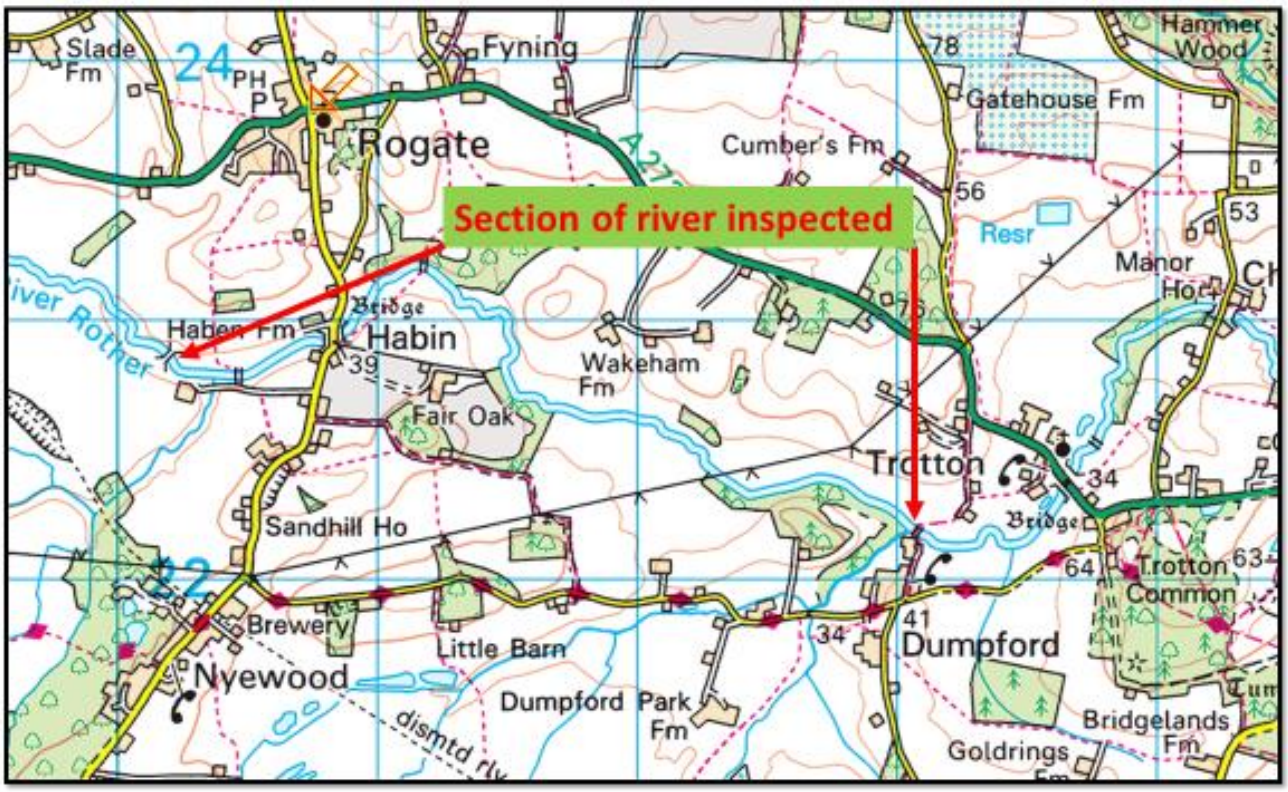
- **The fishery at Fair Oak supports a diverse range of habitat suitable for all life stages of brown trout.**
- **The best quality spawning and nursery habitat is mainly located in the 1km reach below Habin Bridge**
- **Habitat quality in the bottom 0.5km reach is adversely impacted by the milling impoundment at Trotton, which also potentially restricts access for migratory fish.**
- **Fallen woody material provides essential habitat for invertebrates and cover for fish and where possible should be left in place, or moved and secured.**
- **Tree management to preserve bank-top trees and a programme of tree planting is required to provide a succession of river-side trees for future bank defences.**
- **The river here lends itself to a wild fishery rather than a managed stocked fly fishing beat.**
- **If some stocking is to continue. Limit the range of stocking to short sections at either end of the fishery where opportunities for wild fish recruitment are limited.**

1.0 Introduction

This report is the output of a site visit to Fair Oak Estate on the Western Rother between Habin and Totton in West Sussex. The request for the visit came via the fishing syndicate who have access to approximately 3.5km of single and double bank fishing.

The estate owner and syndicate are keen to explore opportunities for improving the fishery and in particular actions that might help to improve the wild component of the stock. The current brown trout (*Salmo trutta*) stocking programme was also discussed and is explored in more detail in section 4. Stocking.

Comments in this report are based on observations made during the site visit and discussions on the day with the land owner and syndicate leader. 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 specific locations.



Map1. River Western Rother. © streetmap

River	Western Rother
Waterbody Name	Western Rother
Waterbody ID	GB 107041012810
Management Catchment	Arun and Western Streams
River Basin District	South East
Current Ecological Quality	Moderate Status
U/S Grid Ref inspected	SU 80554 22819
D/S Grid Ref inspected	SU 83099 22183
Length of river inspected	3.5.km

Table 1. Overview of the waterbody. Information sourced from

http://environment.data.gov.uk/catchment-planning/WaterBody/GB107041012810

2.0 Catchment Overview

The western Rother (Waterbody ID 107041012810) has been assessed as being in 'moderate status' under the Water Framework Directive and 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 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 through the chalk to the west and south, as well as springs on the greensand ridge to the north. The Rother then flows due east to Hardham, where it joins the Arun 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 principal sources: either from broken outcrops of sandstone, or from small lenses of flint. Although strong populations of wild brown trout are to be found upstream of the Petersfield area, 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 draining both the chalk downs to the south and the northern greensand ridge. Access all the way upstream to the headwaters above Sheet is extremely difficult as numerous weirs and old 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 in the upper reaches, however several pollution incidents have resulted in low-level fish mortalities upstream of Midhurst

The river suffers periodically from low flows, and the intensive nature of the local agricultural land-use 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 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.

The Rother has been extensively modified, with the river downstream of Midhurst utilised as a navigation channel, constructed in the late 1700s but abandoned for commercial use in the 1880s. The river still has the legacy of the old navigation with several weir structures still present. Old milling structures also adversely impact on fish migration and sediment transport in the reach from Midhurst to Petersfield, with the old milling impoundments at Steadham and Trotton having no recognised fishways. Upstream access over these and other impoundments is considered to be problematic for all fish species, apart from perhaps the odd large trout on the back of a flood event.

3.0 Habitat Assessment.

Unsurprisingly, this reach of the Western Rother is heavily impacted by the old milling impoundment located at Trotton Mill (photo 1), which forms the bottom boundary of the fishery. The river looks to have been re-aligned and perched, presumably to gain a greater head for milling, the legacy of which is clearly visible with old milling stones set into the floor of wing wall of the impoundment (photo 2).

What looks to be the old original river channel can be seen running in the valley floor a short distance to the north (photo 3), although this channel also looks to have been heavily modified.

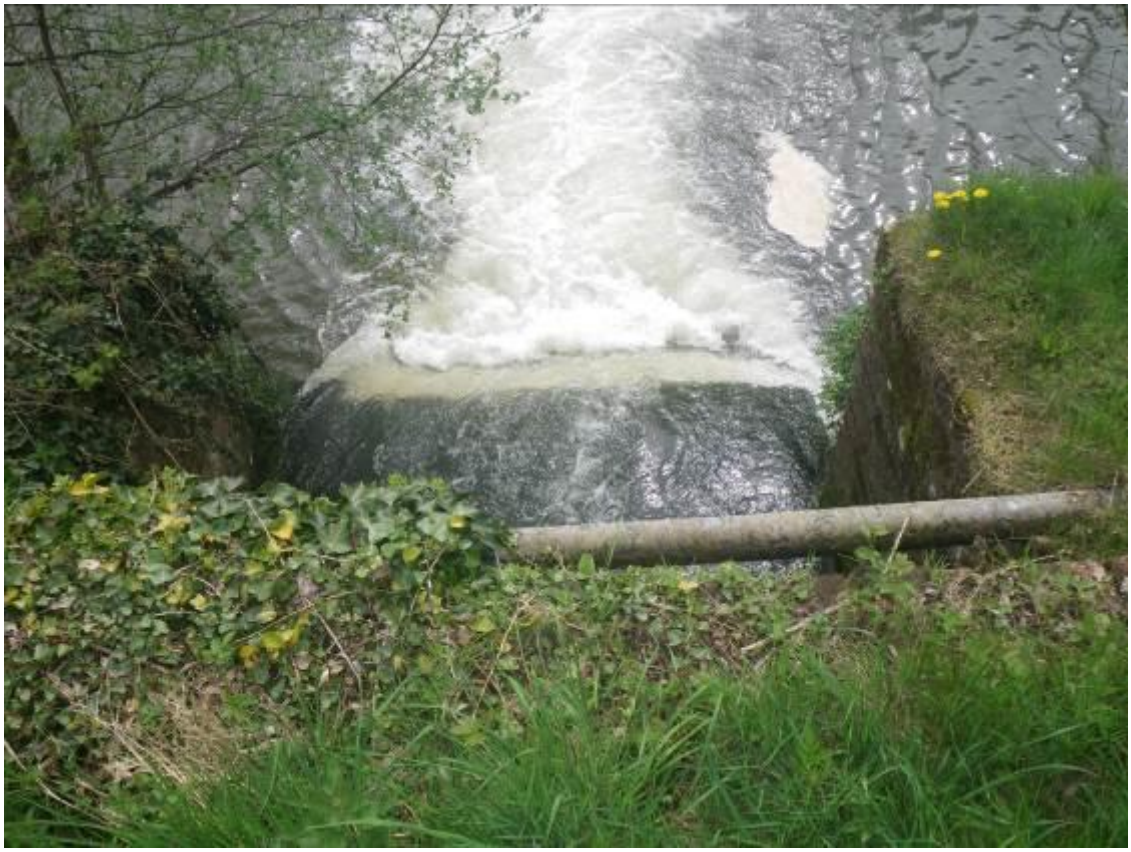


Photo 1 Impoundment at Trotton Mill. Problematic for fish migration

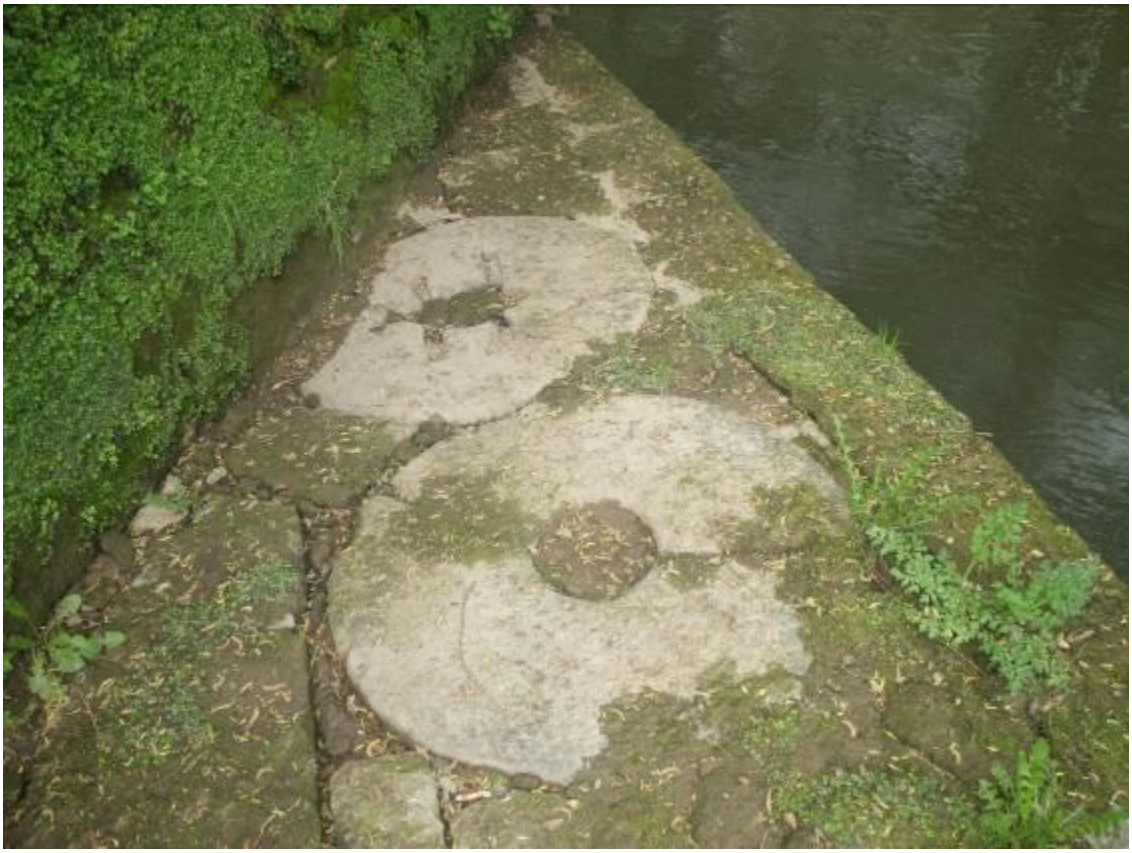


Photo 2. Old mill stones used as part of the weir structure.

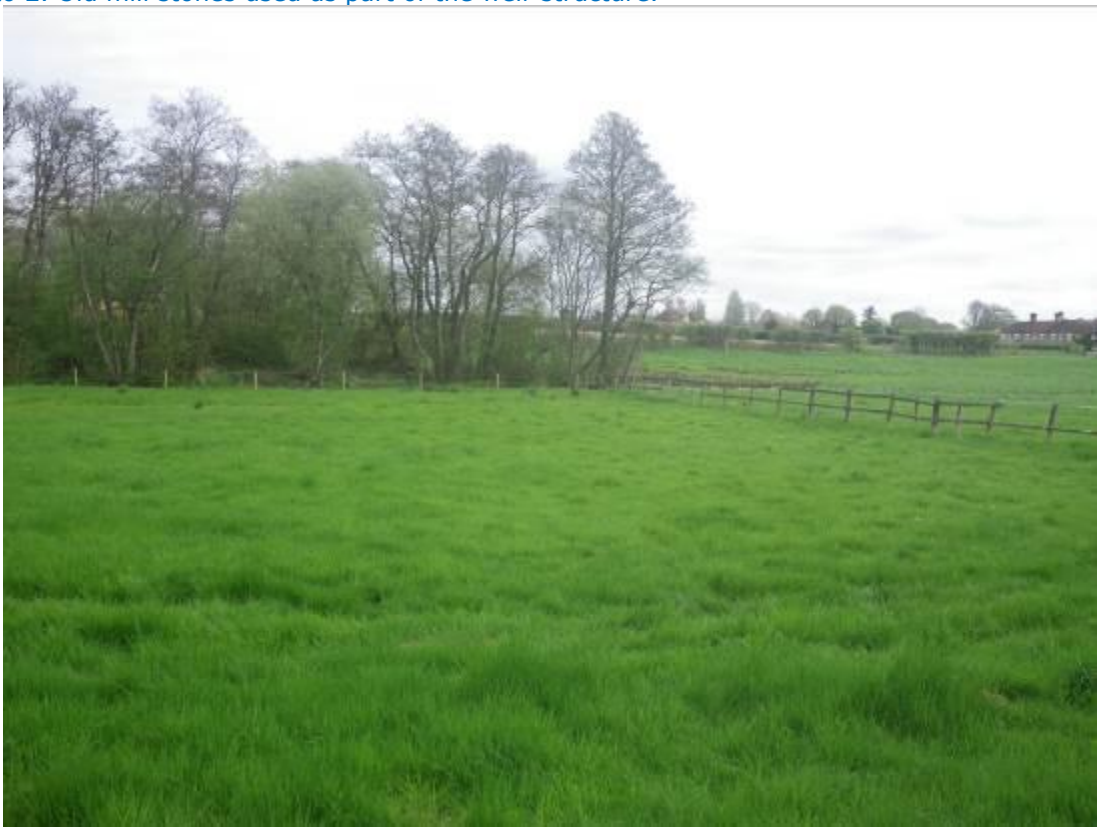


Photo 3. Tree lined ditch line to the north of Trotton Mill may have been on the original course of the river prior to the mill construction.

The milling structure is currently being managed with upstream water levels being run as low as possible, with all of the hatches fully drawn and stop logs removed (photo 4). Never the less, the structure still has an estimated head loss of approximately 600mm, which under the majority of flow conditions would mean that it acts as a block to any upstream fish migration. Even in spate conditions, when the head loss is drastically reduced, the high water velocities generated via the narrow hatch arches would be a challenge for all but the largest, most powerful swimming salmonids.

There is a secondary set of hatches adjacent to the RB (photo 5) with a higher invert than the main hatches and it might be possible to construct a technical fish pass within one of these chambers. The best outcome for the river would be to remove the impoundment completely. It is worth having a conversation with the mill owner to explore options, even if the prospects of complete removal of an historic milling impoundment seem very remote. Fish passage could be improved here with the Mill owners consent and could be the subject of a project proposal where technical and funding options explored in detail.

There is no doubt that if the issues associate with free fish movement at Steadham Mill, located approximately 3km downstream, are ever resolved then improving access for migratory fish at Trotton should become a priority action for the Environment Agency and the Catchment Partnership. There is also a troublesome flow gauging weir located in between Steadham and Trotton at Iping but improved access for fish migration could be achieved here at relatively low cost with EA agreement.

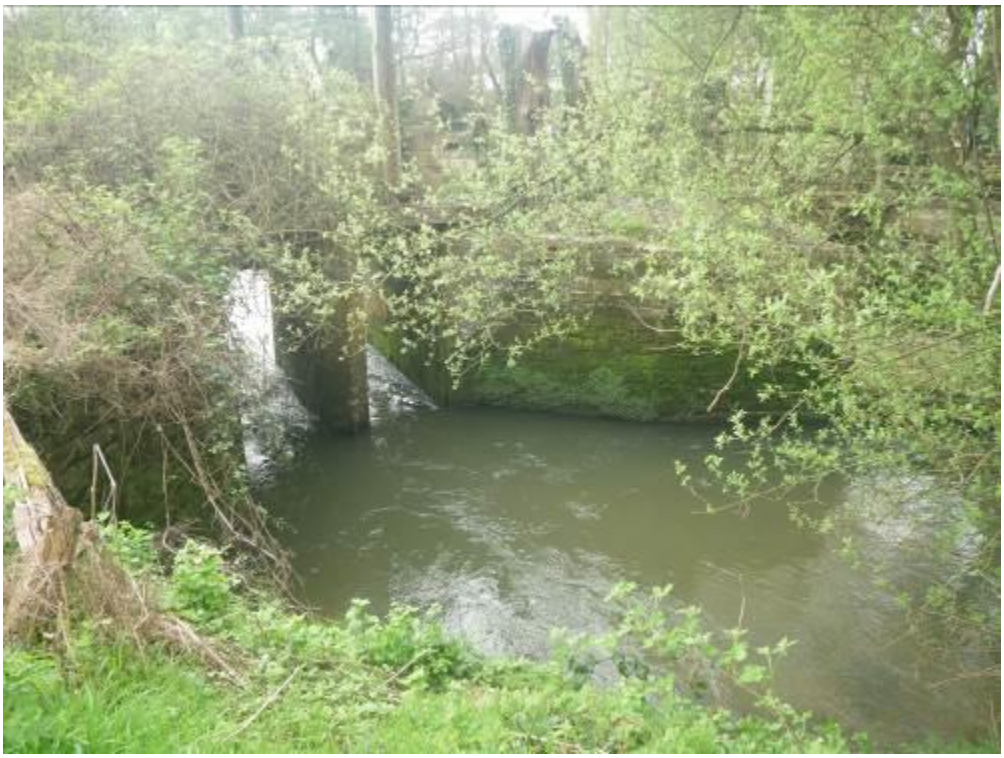


Photo 4. All the hatches are fully drawn, which helps to reduce the impounding effect on the reach upstream.

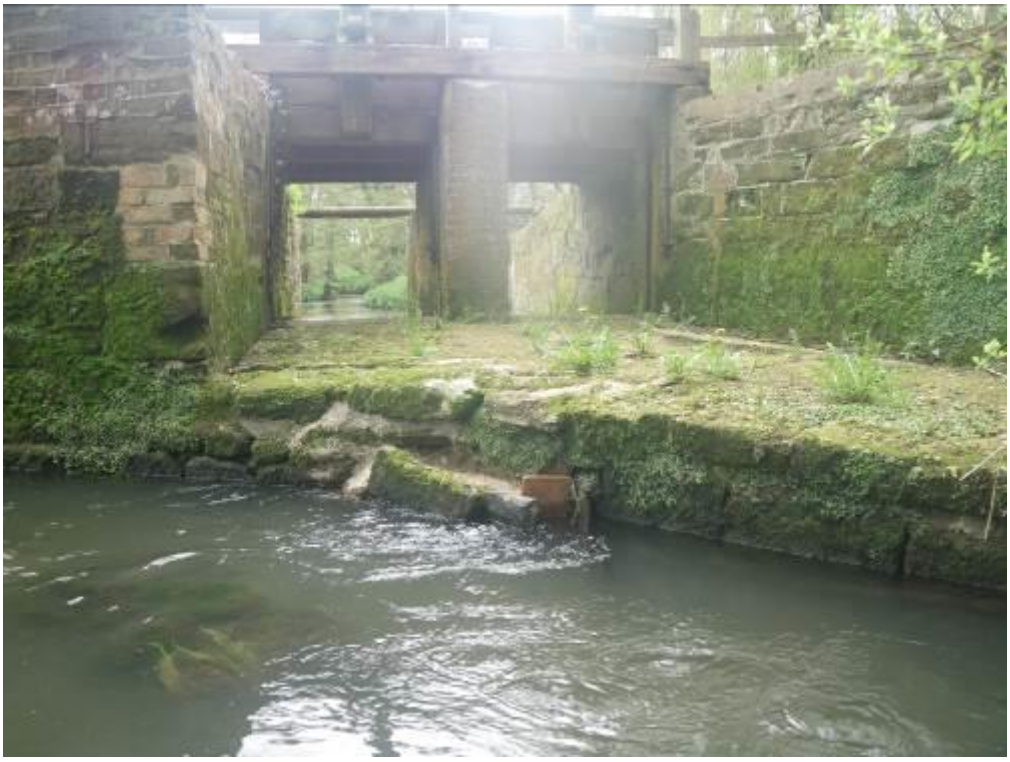


Photo 5. Additional capacity is available via two hatches adjacent to the RB

Habitat quality in this lower reach of the Fair Oak beat is considered to be poor. The 500m of channel above the mill is dominated by shallow uniform glide habitat flowing over a mainly sand-covered bed and lined by soft, friable river banks (photo 6). The only significant in-channel cover for trout is provided by the occasional root systems of river-side trees, such as Alder (*Alnus glutinosa)* and goat willows (*Salix caprea)* and occasional ash trees (*Fraxinus excelsior),* primarily located on the RB. Stock fencing has been installed adjacent to the LB but with a very narrow buffer zone between the fence and the soft bank tops. This lower section of LB is vulnerable to erosion and possibly block failure due to the comparative lack of bank-top trees and associated root systems.

Two habitat features are worthy of mention in this bottom reach. There is a short section of shallow run, with what looks to be a hard, gravel lined bed, colonised by watercrowfoot (*Ranunculus* spp.) growth (photo 7). This provides a short but valuable habitat for invertebrates and presents possible fish spawning opportunities, however the lack of any significant, well covered nursery habitat in the vicinity compromises its value to the fishery.

The location of this gravel outcrop is curious because there did not appear to be any seam of gravels in the toe of the bank. In addition, this riffle is located along a very straight section of channel and it is not obvious how these gravels would have been scoured and deposited in this location. A possibility is that the riffle is man-made with introduced gravels, or they have been previously deposited by the small chalk derived tributary that joins (photo 8) from the south. Although this small tributary now discharges a few metres downstream of the riffle, it is possible that this has also moved, either naturally, or by the hand of man.

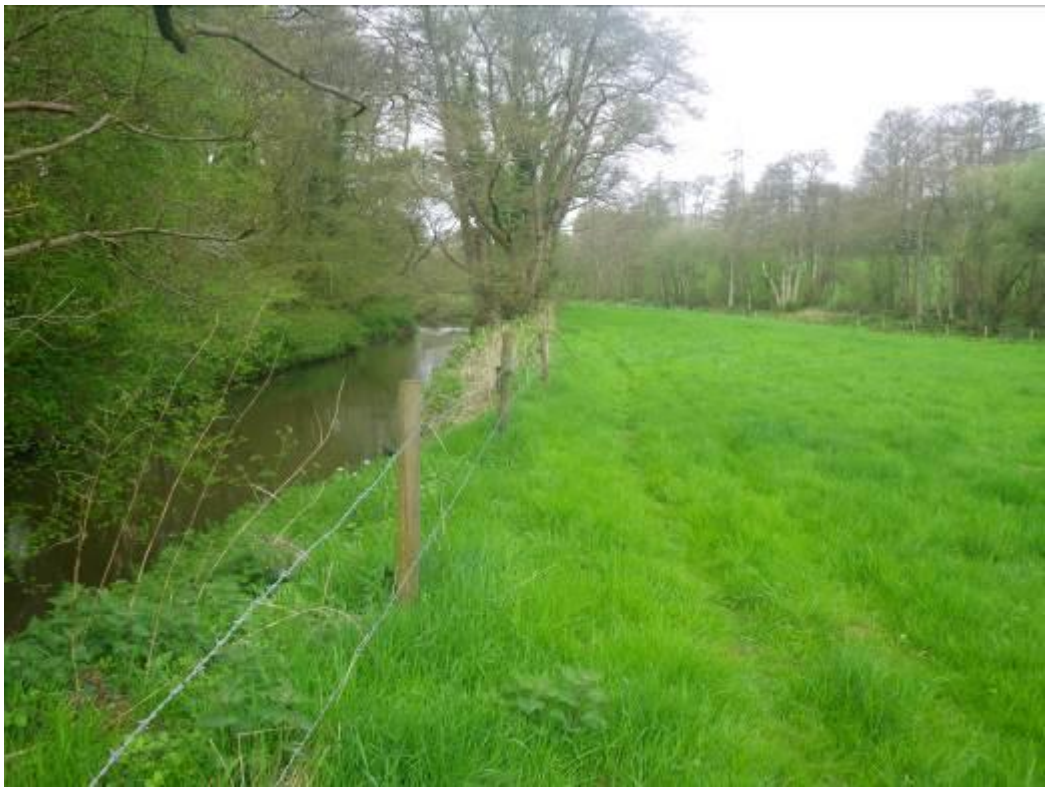


Photo 6. Section immediately upstream of the mill is dominated by shallow glide habitat over a mainly sandy river bed. Habitat quality in this reach is considered to be poor for most fish species.

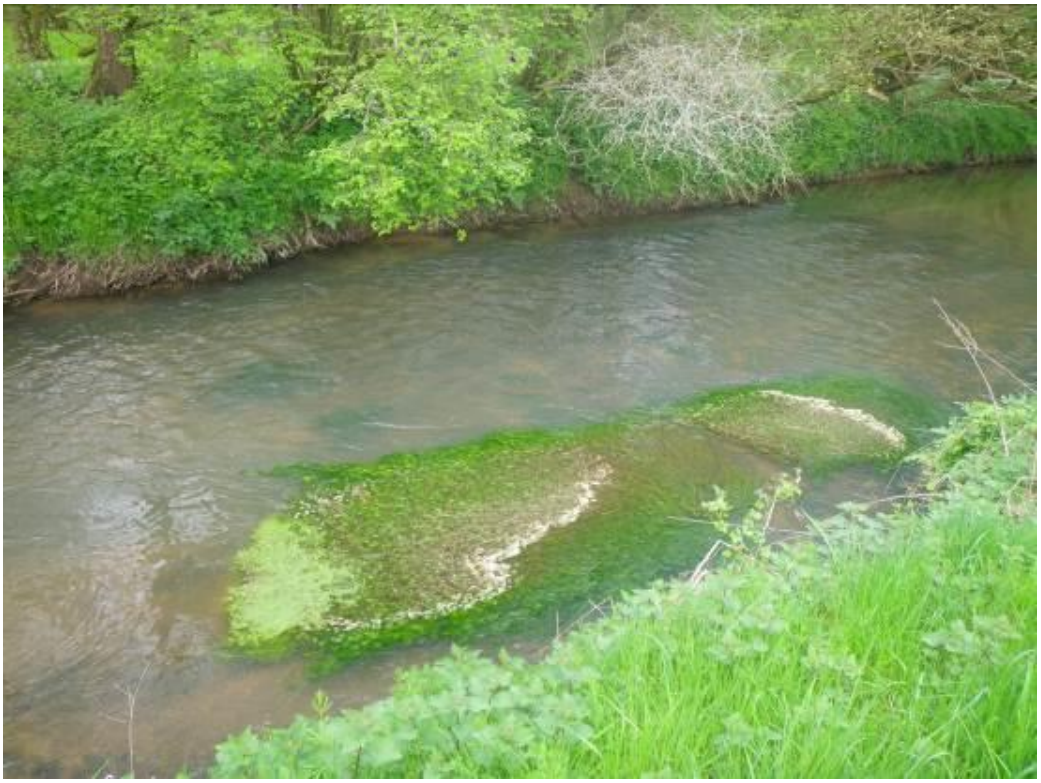


Photo 7. A short section of shallow riffle habitat supporting luxuriant crowfoot growth.

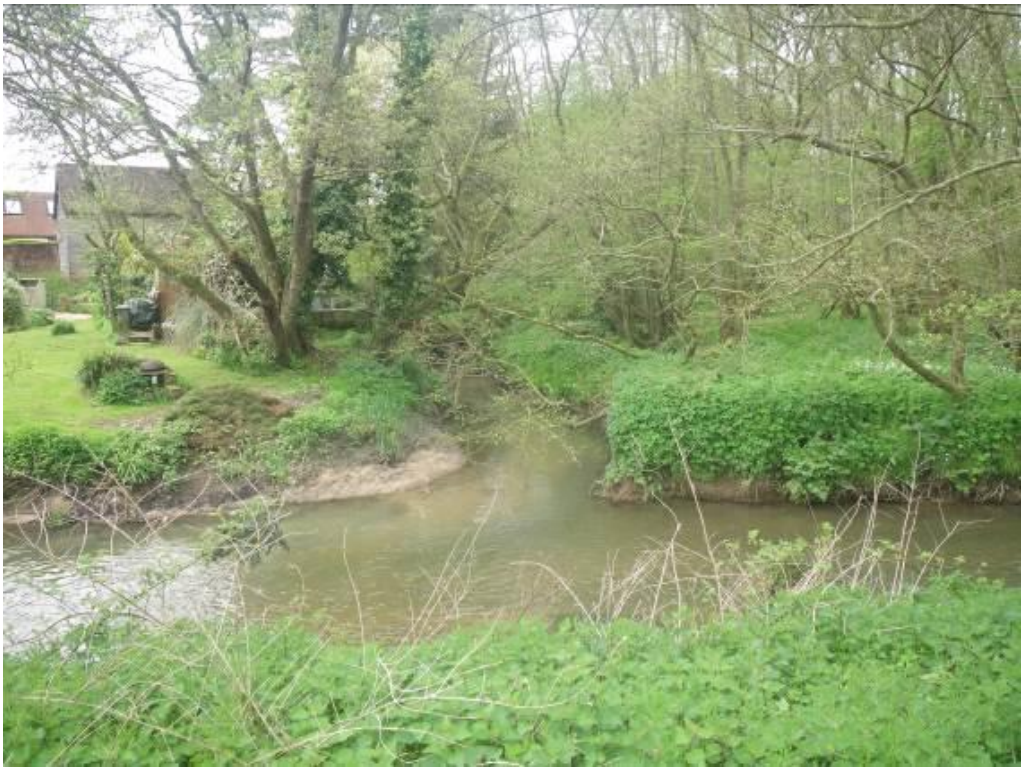


Photo 8. Small chalk stream entering from the south a short distance above the mill.

The tributary itself is a small chalk stream and will be contributing a valuable biomass of both invertebrates and juvenile fish to the main river. Unfortunately its value to the Fair Oak fishery is somewhat limited, discharging as it does at the very bottom of the reach.

It is understood that from the late spring and summer months on, the river supports submerged weed growth, which would typically be submerged ribbon weeds such as burr reed (*Sparganium emersum),* with occasional clumps of starwort (*Callitriche* sp.*)* and water crowfoot (*Ranunculus* spp.*)* particularly in sections where the bed is firm and flow velocities are high.

Maintaining plenty of direct sunlight to those comparatively rare shallow sections of river will help submerged plants to thrive. The weed itself is critically important in providing habitat for a range of invertebrate species, as well as providing 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 Rother and is linked with its geology. However, the sand burden is exacerbated by local land use issues adjacent to many reaches. Fortunately, adjacent land use on the Fair Oak estate is deemed to be river friendly with most river-side meadows put down to either permanent pasture, or left as relatively unmanaged blocks of natural woodland.

Additional cover in the river is available in areas where woody material has fallen into the channel. This woody material, although perhaps considered by some to be a nuisance, is very important in helping to drive valuable changes in the shape of the river bed and banks, as well as providing crucially important habitat for invertebrates and as refuge areas for fish. Winter cover is naturally sparse on

the Rother and a tangled matrix of fallen brushwood can help to reduce predation pressures, particularly providing fish with a safe bolt-hole from winter feeding cormorants (*Phalacrocorax carbo*).

Full channel width debris dams (photo 9) can sometimes be a problem and a watching brief should be kept to ensure that any dam does not get completely occluded with fine material, resulting in a weir forming. All the while the debris dam has some under-shot flow, then it is unlikely that sediment transport is going to be significantly interrupted and free access for migrating fish can also be maintained. As seen from the photograph, full width debris dams can fulfil a useful role in trapping discarded plastics, however these debris dams require regular maintenance to avoid an unsightly build-up of waste material developing. If significant quantities of plastic litter are confirmed to be washing downstream from urban areas or public crossing points like bridges, consideration could be given to installing floating booms to intercept this litter at points which are easier and more accessible for clearance and removal of rubbish.
A key concern to many riparian owners on the Rother is bank erosion (photo 10). As previously stated, the banks are extremely soft and friable and when woody material falls into the channel it can locally exacerbate bank erosion. Equally, fallen woody material can help to protect vulnerable banks when it is packed into the toe of the bank and consists of a tight matrix of brushwood. This very much depends on the orientation of any fallen trees to the flow and whether or not the given tree helps to slow down flows adjacent to the toe of the bank, or conversely force elevated flows against undefended margins, where bank erosion is most likely to occur.

Bank erosion should be viewed as a completely natural process on any healthy river system and should only be a concern when valuable infrastructure is threatened, or when erosion levels significantly change in response to alterations in land management, or changes in bankside flora. On this section of the Rother, it is notable that some banks are vertical (cliff-like) in nature and poorly defended with few well-developed root systems. This was particularly evident on sections where a lack of marginal trees has led to banks being more vulnerable to erosion. The presence of non-native plants such as Himalayan balsam exacerbates these pressures by leaving key bank-side areas potentially devoid of the binding root systems usually provided by a thick under-storey of native plants. Intensive grazing pressures can add to the cocktail leading to bank slumping.

A notable exception to concerns over bank erosion is where there are obvious seams of eroded gravels, either derived from flints, or small local outcrops of eroded sand or iron stone. When these areas are identified, actively encouraging bank erosion via strategically securing large tree trunk sections into the channel to free-up fresh gravels is a good option for promoting improved gravel spawning habitat. These eroded bank and bed gravels normally settle into valuable ramps in the form of gravel bars, or occasionally full channel-width riffles (photo 11). These areas are of critical importance for many species of spawning fish, including trout and are also favoured areas for many specialised aquatic invertebrates.

The presence of significant quantities of gravel were evident from the diggings of a badger very near to the top of the RB (photo 12). It could be assumed that the

gravel seam here extends to the toe of the bank and light bank erosion here should be viewed as beneficial.

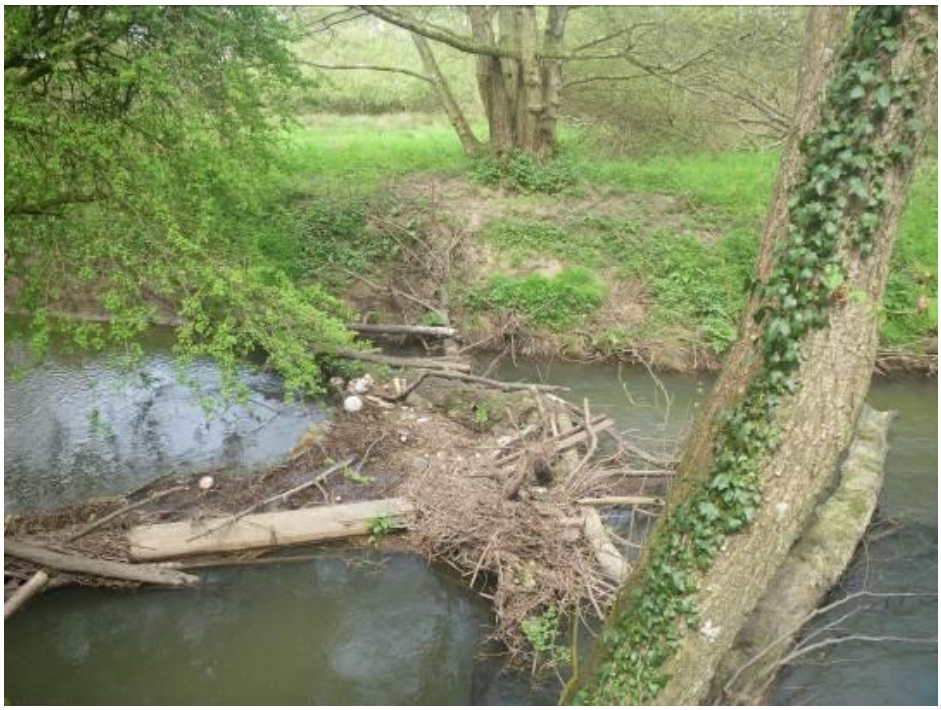


Photo 9. Full channel width debris dams will trap detritus and should be regulalrly monitored to ensure that a differential head in water levels does not form.

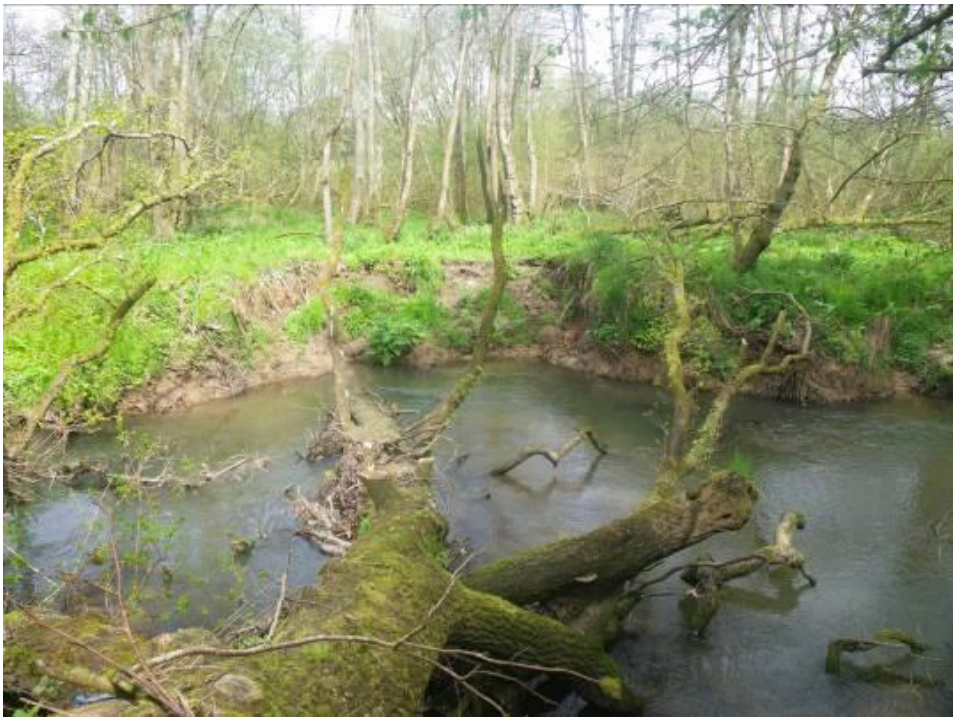


Photo 10. A large fallen tree promoting lateral bank scour

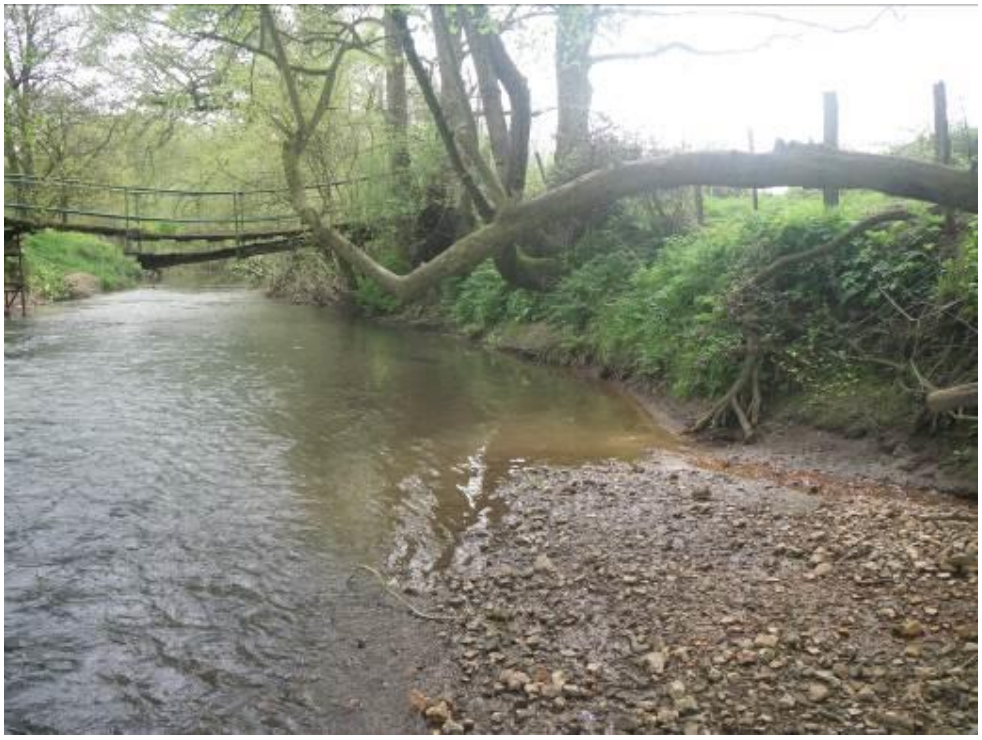


Photo 11. A rare and valuable Rother gravel bar probably freed up as a direct result of fallen woody material promoting bed and bank scour

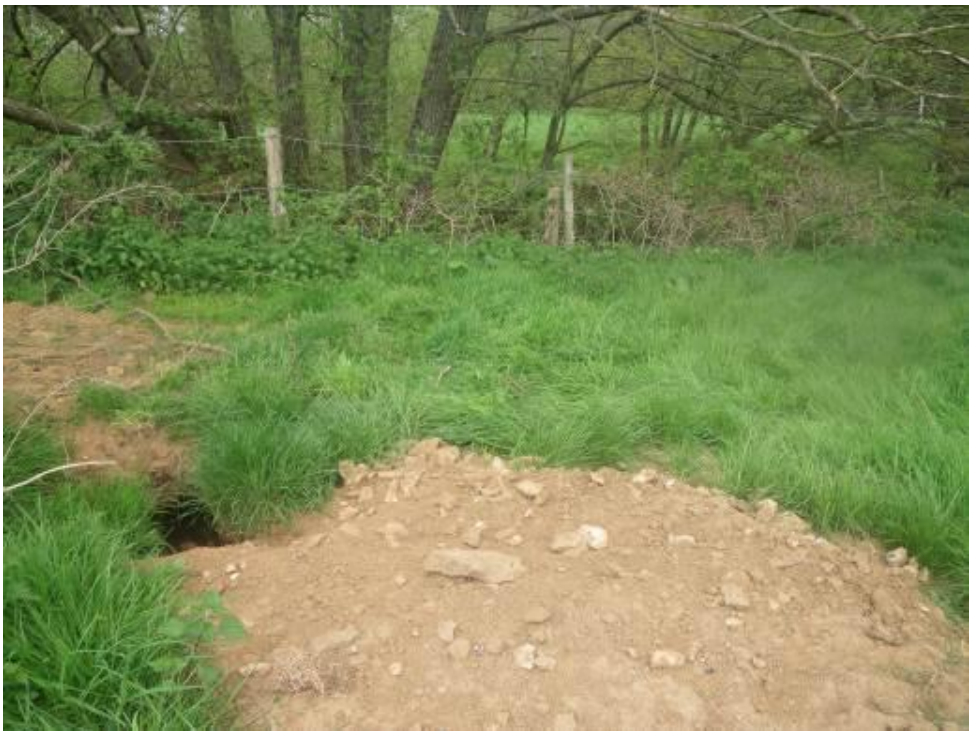


Photo 12. A bank top badger set reveals a seam of gravels.

Habitat quality in the reach running approximately from where the high voltage pylons cross the river, right up to Habin Bridge was generally considered to be very good. Here the river has an active morphology with varied channel depths, substrate diversity and meandering planform. Photo 13 depicts a typically

attractive run and one which my colleague Theo quickly "sampled" at the request of the syndicate leader and which promptly produced a lovely Rother wild brown trout.

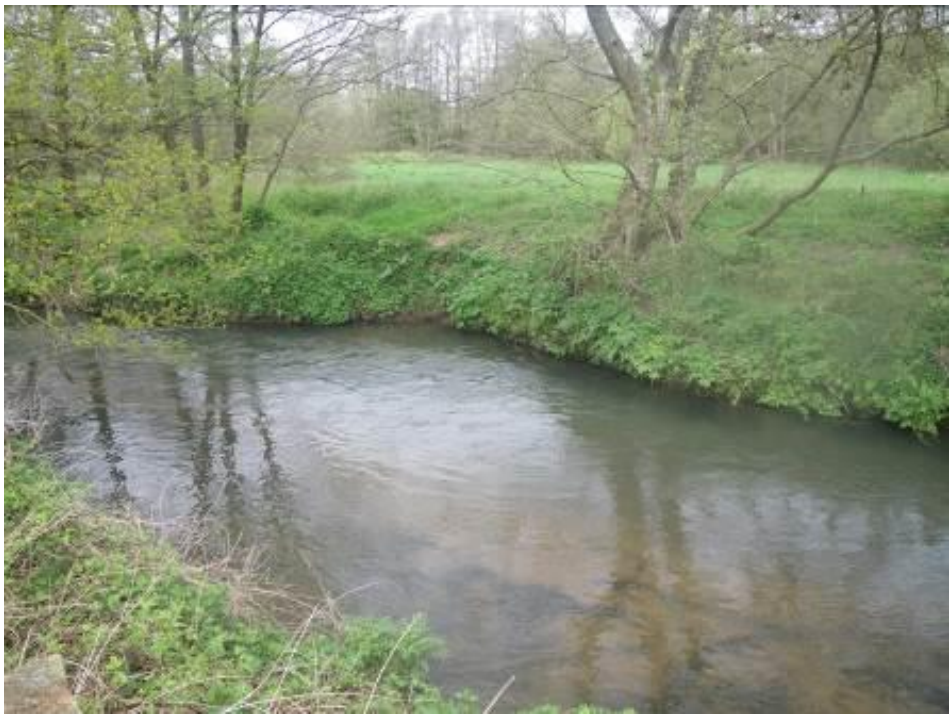


Photo 13. A typically attractive run in the middle reaches. Note the "river friendly" land use on the valley floor adjacent to the LB.

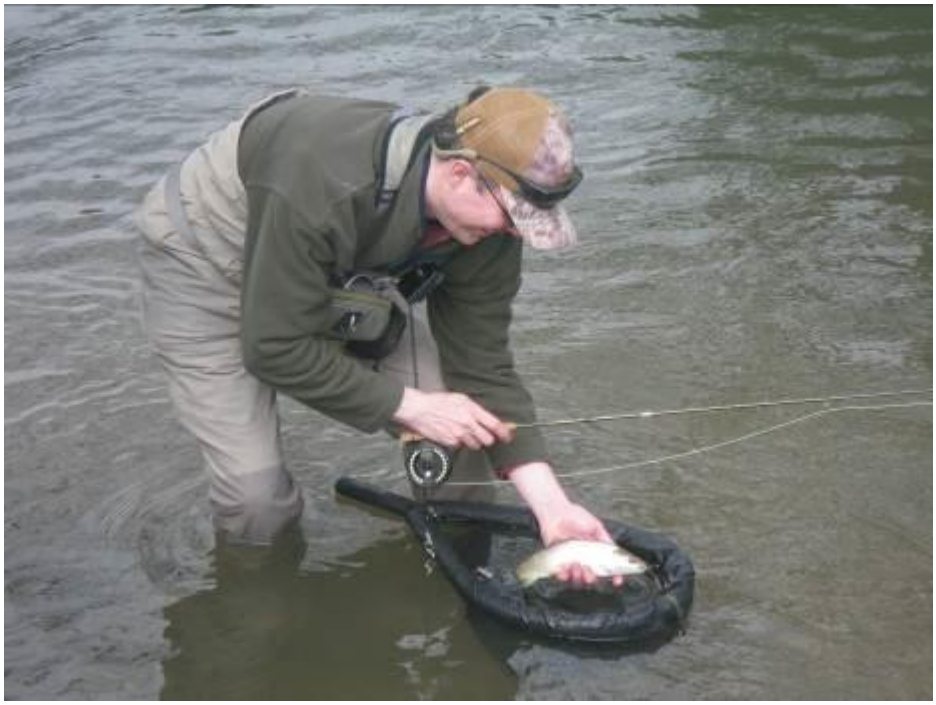


Photo 14. Wild Rother brown trout captured from the run in photo 13 confirming the potential of this section of the river for holding adult brown trout,

Unlike many sections of the Rother below Petersfield, the land use in the valley floor was mainly permanent pasture (photo 15) with occasional blocks of broad-

leafed woodland, wet meadow and amenity fields for horse eventing. There was the occasional glimpse of arable fields (photo 16) but usually behind substantial wooded buffer zones, with no obvious signs of sediment pathways.

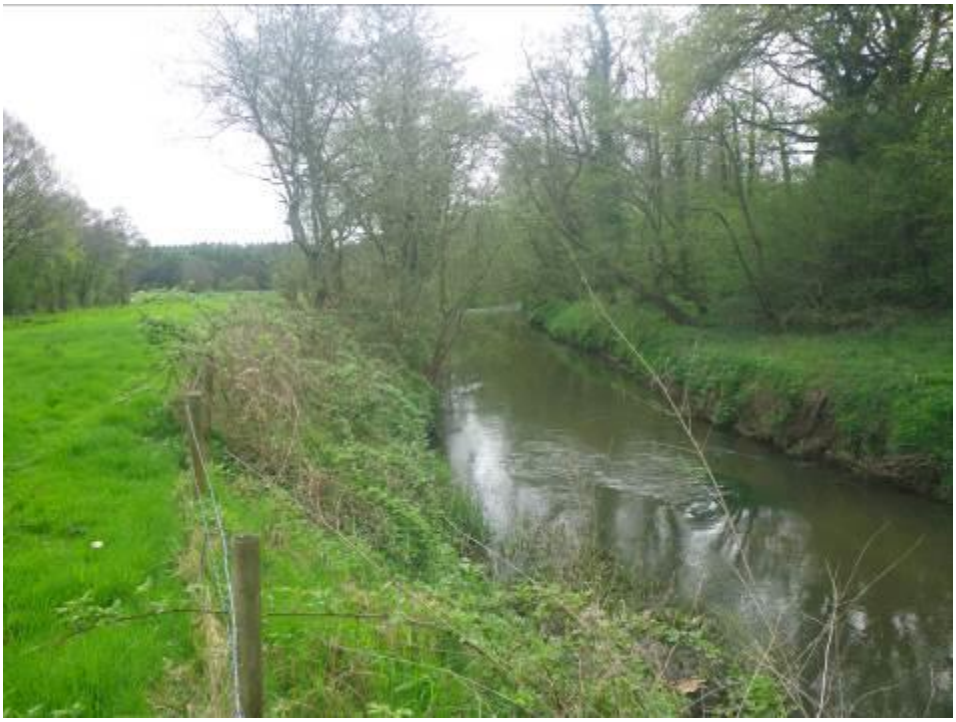


Photo 15. Typical riparian scene at Fair Oak with permanent pasture fenced from the river and blocks of deciduous woodland.

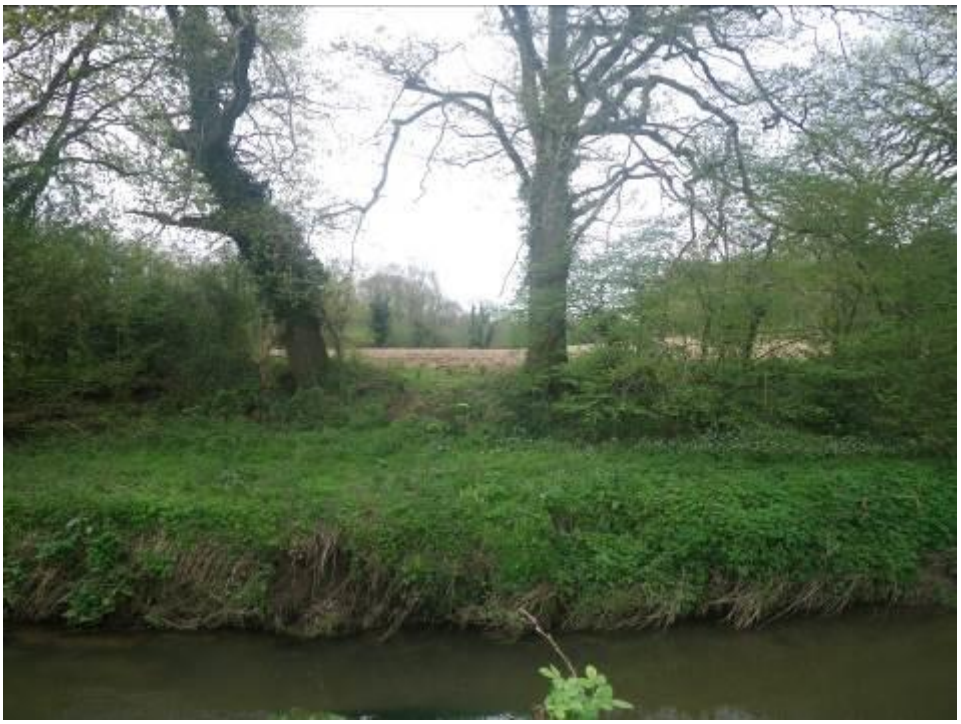


Photo 16. A freshly ploughed arable field behind the tree line but no obvious sediment pathways. Arable fields, particularly on sloping valley sides are source of nutrient rich sediment on many sections of the River Rother.

In several locations the lack of a wide buffer strip, coupled with grazing pressures and a lack of well-developed root systems on the top of the bank are threatening to cause block failure of the bank (photo 17). This is not an uncommon sight on the Rother and often results in lines of hanging fence posts above the river.

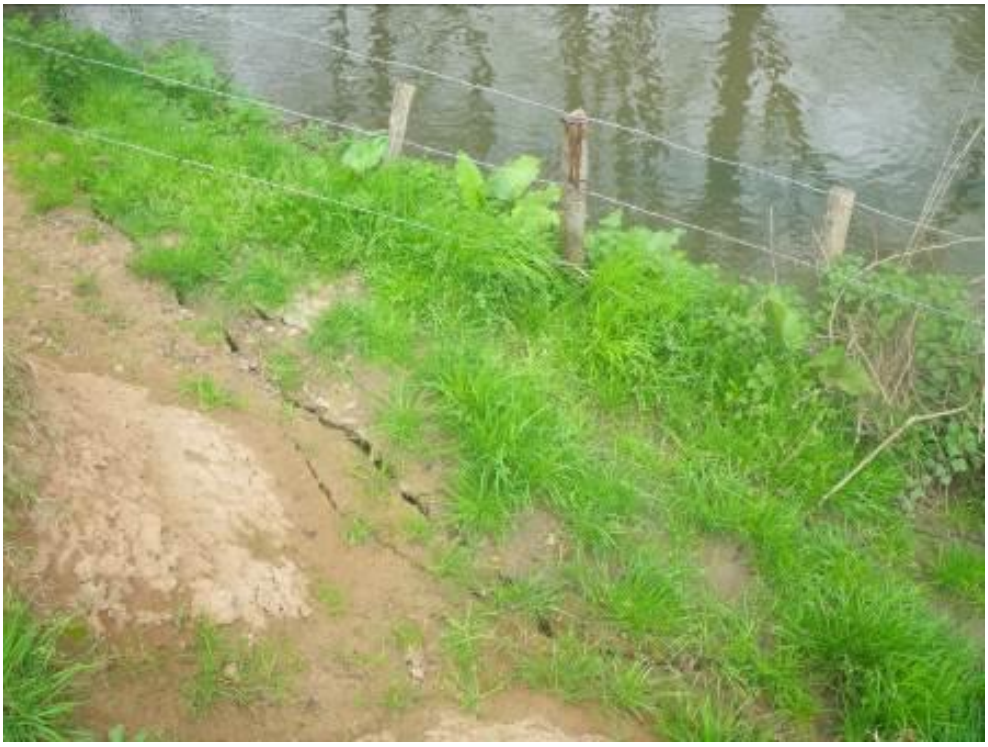


Photo 17. An example of immanent bank failure (block failure) where the buffer zone is far too narrow, coupled with a lack of binding root systems that usually results in slumping.

At one particular location there was evidence of an old oxbow (photo 18) adjacent to the LB which is now gradually reverting from open water to dry land. When still connected to the river, these relict channels often provide superb habitat, particularly for coarse fish species. Creating backwater habitat on rivers like the Rother, where the channel is deeply incised, is extremely difficult and periodically digging out sediment from natural features such as this is one method of providing high quality summer habitat for coarse fish fry, as well as a spate flow refuge area for all life stages.

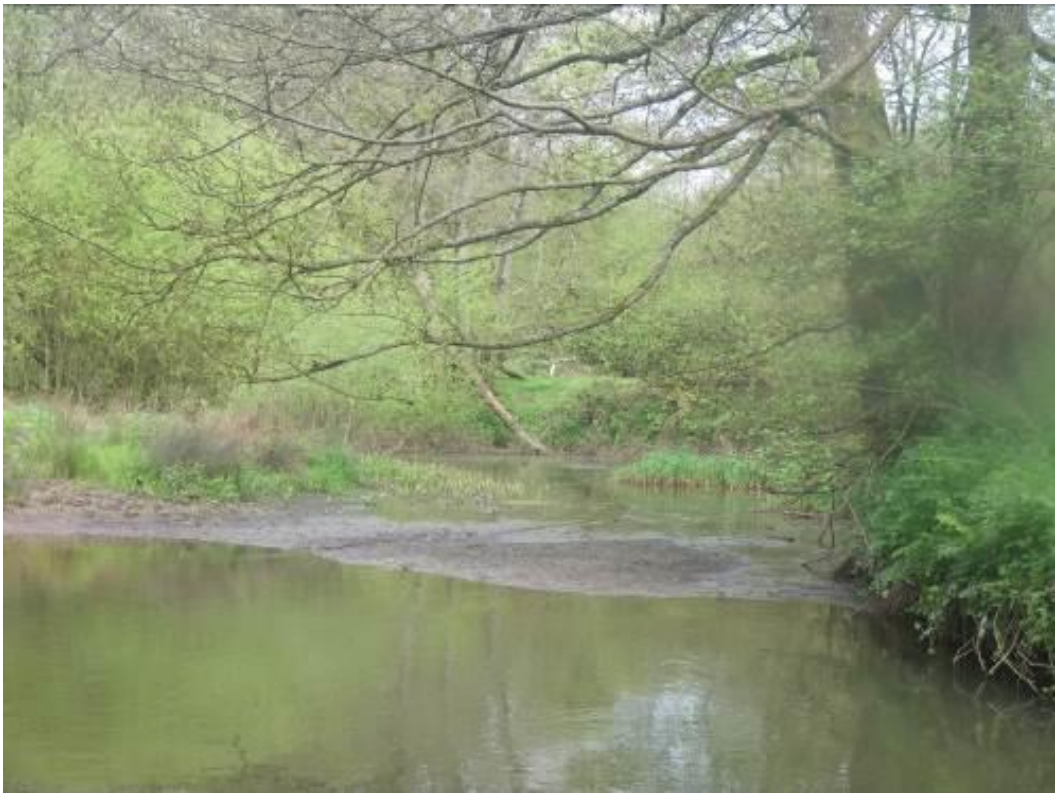


Photo 18. An old oxbow backwater now separated from the river channel. Potentially this could be periodically dug out to create a high quality coarse fish habitat. A project like this could potentially attract Rivers Trust or EA funding.

In general the level of tree shading was considered to be beneficial and not particularly excessive. Tree shading is critically important in helping to moderate water temperatures, essential for any trout river. Where possible, encouraging low-level shading, where branches trail into river margins is considered to be particularly valuable. Certain tree species are more likely to provide this type of cover, with low bushy species such as sallow (photo 19), thorn trees and elder particularly valuable, especially when growing out from near the toe of the bank, rather than on top of the bank.

Alder trees (photo 20) were by far the most dominant bank top species at Fair Oak and these provide excellent bank protection and fish cover via well-developed root systems, which often form a tangled mat of sub surface cover. There is concern in the Rother Valley over phytophthora, a fungal disease which attacks many tree species but which is particularly damaging for alders, with the majority of specimens in the lower valley adversely impacted. When long stands of alder all become mature at the same time it is a good idea to create some diversity in the canopy by selectively coppicing the odd stand here and there. This not only promotes slightly bushy, low-level cover, via multi-stooled re-growth but also preserves the life of the tree and retains the valuable root systems. It is not uncommon for mature unmanaged alders to topple one after another once a single tree is lost, potentially creating a huge work load and a reduction in valuable in-channel cover once complex root systems are lost. Successional planting with a range of low bushy species to potentially compensate for future losses is recommended.

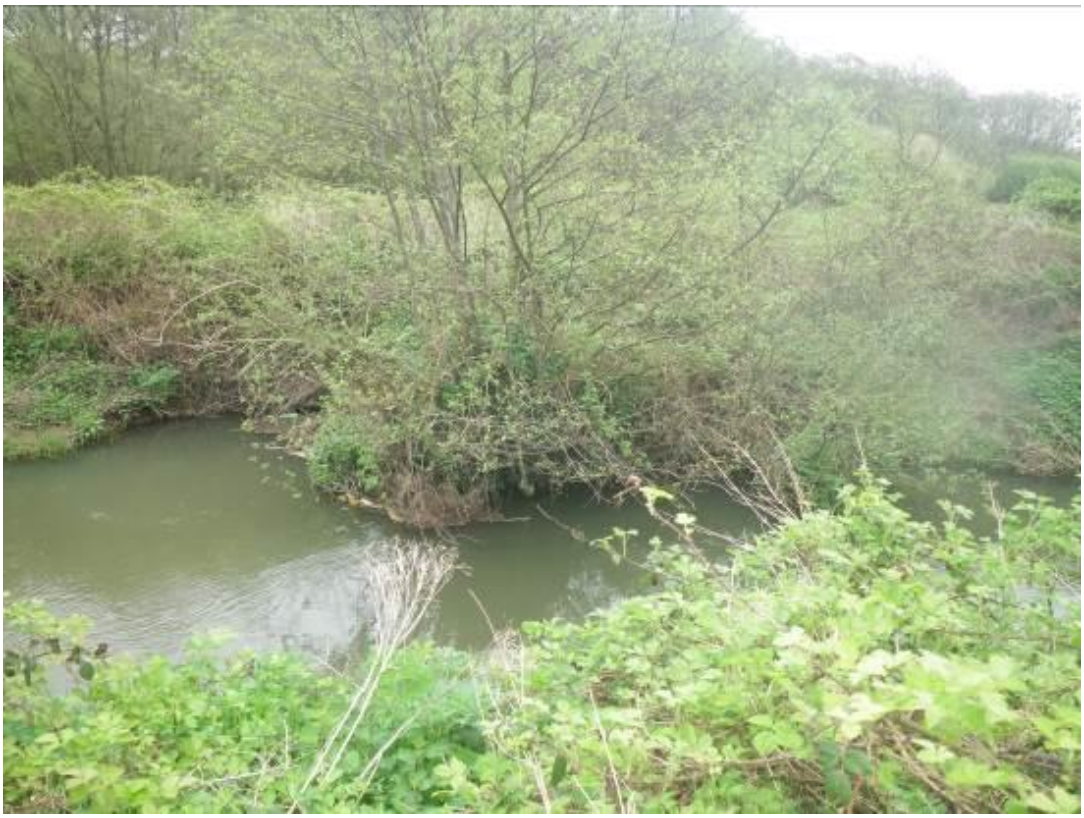


Photo 19. Trees that provide low scrubby cover are considered to be particularly valuable.

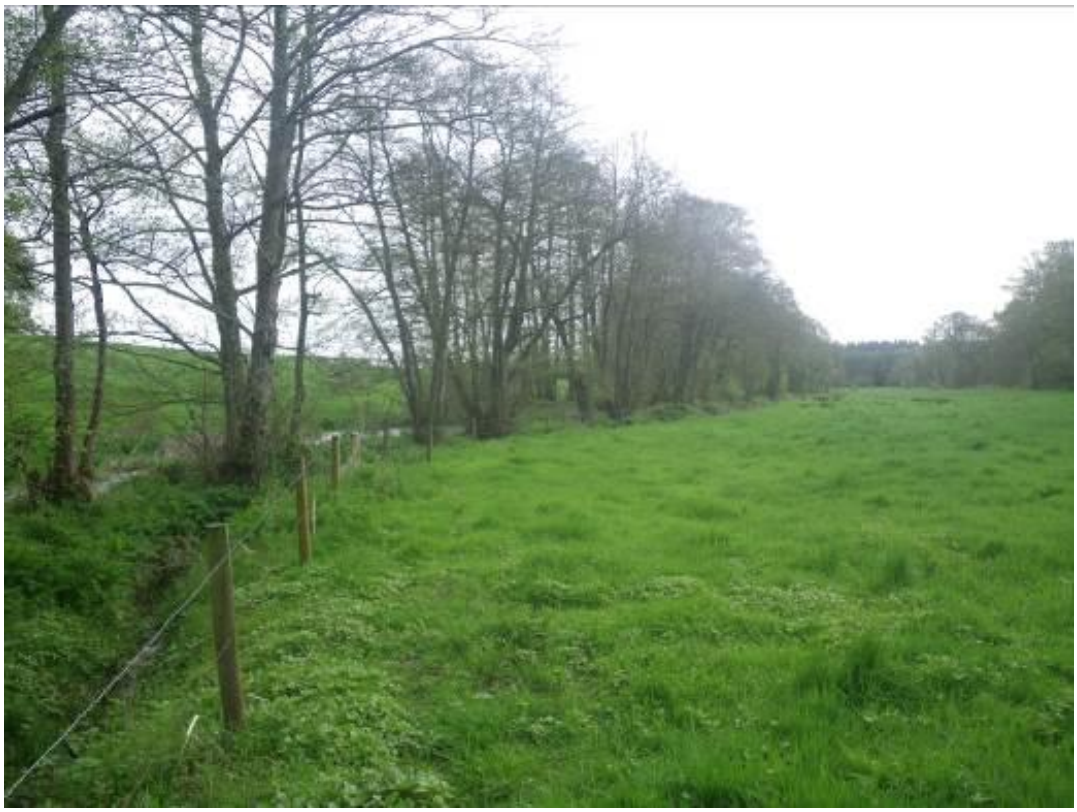


Photo 20. A long line of "leggy" alder trees adjacent to the RB. Occasional coppicing and planting with alternative low level species is recommended.

Potential spawning sites were located adjacent to areas of eroded gravels, forming shallow glides and broken riffles. Where margins were devoid of cover, improved fry survival can be encouraged with the addition of loose brushwood secured into the margins to provide essential cover for newly hatched trout fry.

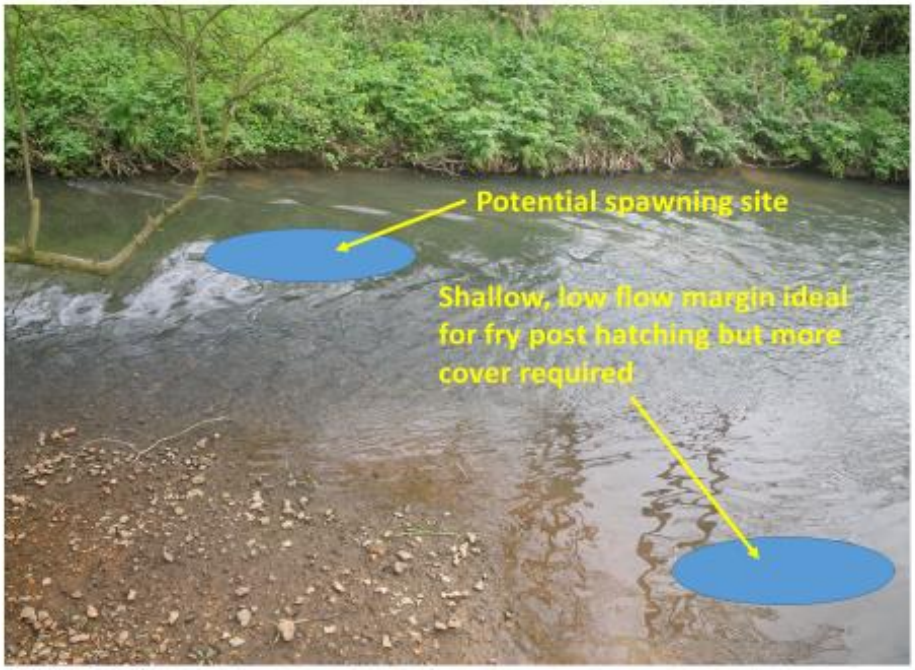


Photo 21. A site that may well attract spawning activity. Improved fry survival can be achieved with the addition of improved winter cover over shallow, low flow margins.
Photo

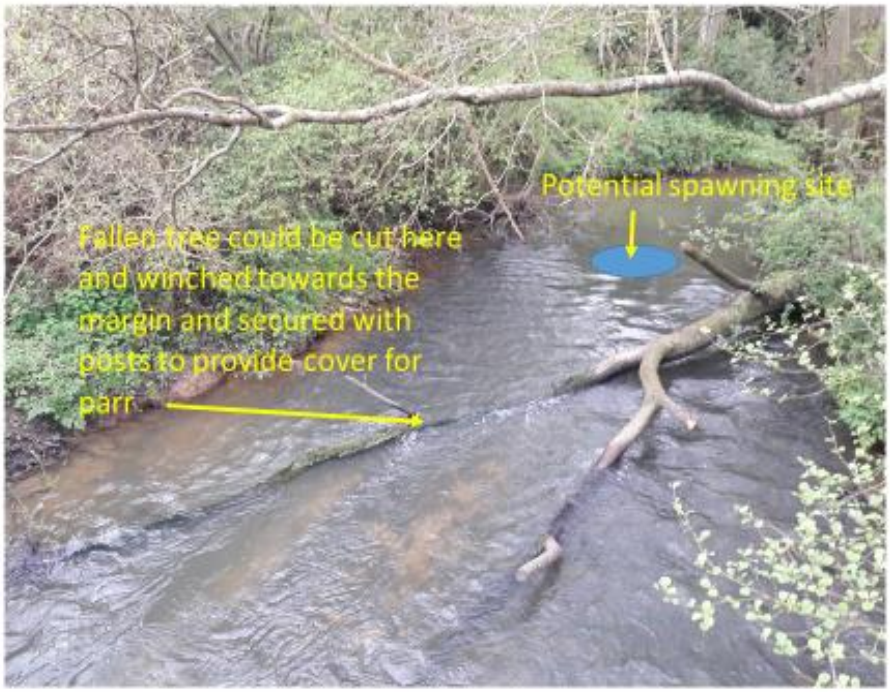


Photo 22. Shallow riffles provide ideal parr habitat when coupled with adequate cover. The fallen trees can be trimmed, moved and secured to create secure lies in the margin.

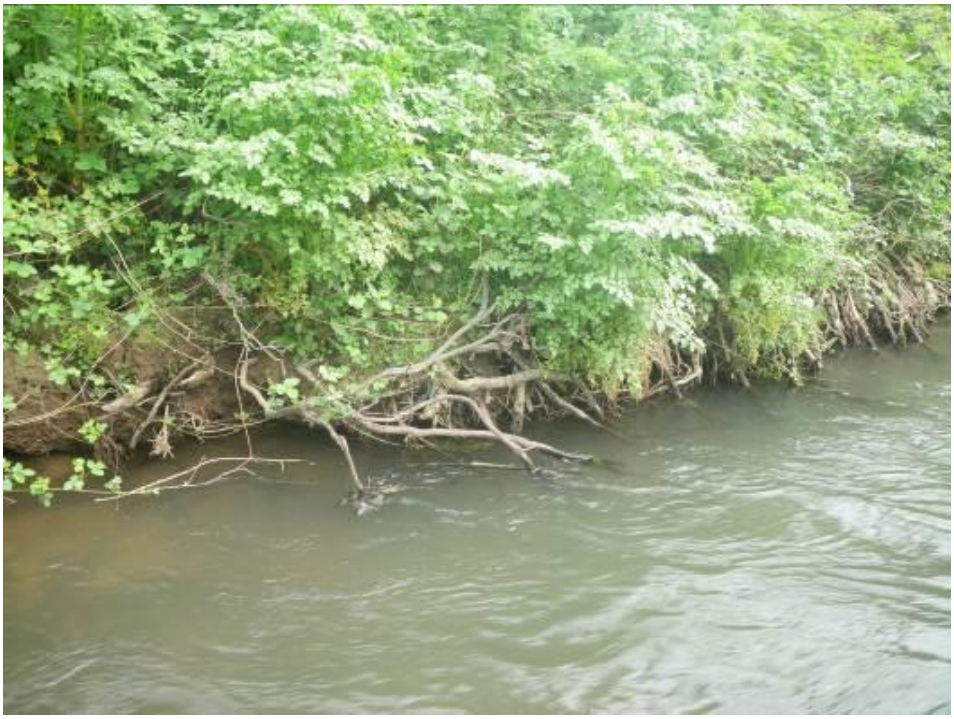


Photo 23. A good example of a well defended margin providing good opportunities for fish.

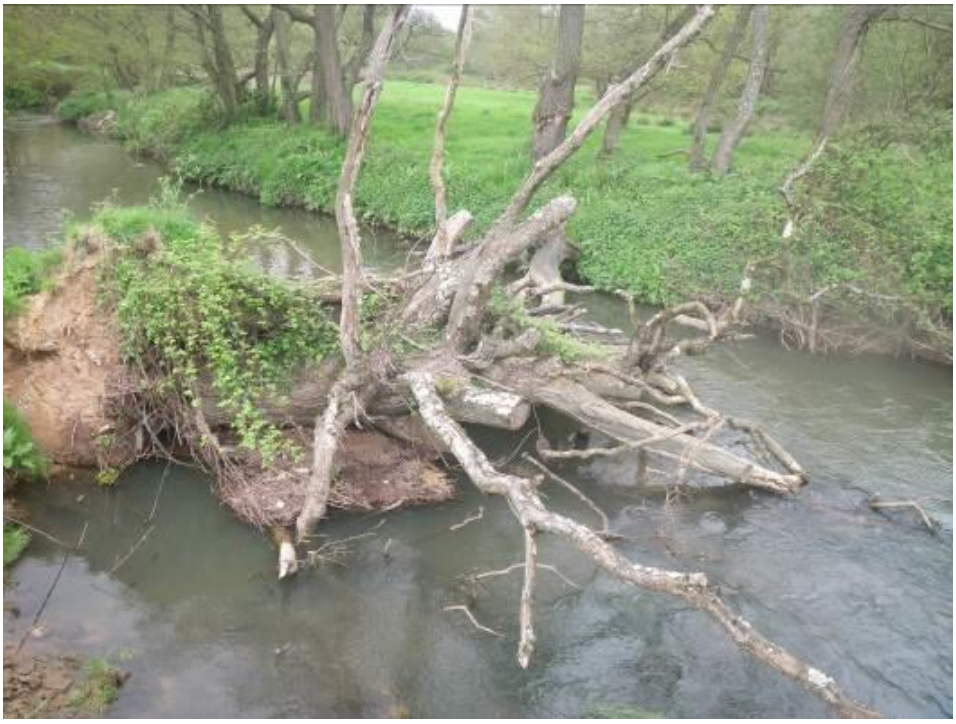


Photo 24. Large scale fallen trunks and root wads can often scour high quality pool habitat and throw up ramps of gravel providing potential spawning sites. The message here is to leave as much of this type of material in the channel as possible.

At the time of the site visit it was too early in the season to fully assess the presence of certain non-native plant species. Annual and bi-annual plants that out compete deep-rooted native plants are of particular concern. One such plant is Himalayan balsam which is endemic in the Rother catchment but efforts are being made by both local voluntary groups, supported by the South Downs

National Park Authority to try and control its impact and range. Although this would appear to be an impossible task, there are examples from other catchments where voluntary groups are making serious inroads into the balsam problem.

Another non-native plant that appears to be on the increase in the Rother catchment is American skunk cabbage. Although not detected during the site visit, it is recommended that any examples are quickly grubbed out, as this plant has the capacity to colonise shallow, wet margins, outcompeting native wetland herbs and emergent plants and again leaving the banks vulnerable to erosion through the winter months.

Another Victorian gardeners' legacy can also be seen at Fair Oak Estate in the form of extensive laurel or rhododendron bushes. These are considered to be inappropriate riverside plants due to the heavy shading and toxic nature of the leaves.

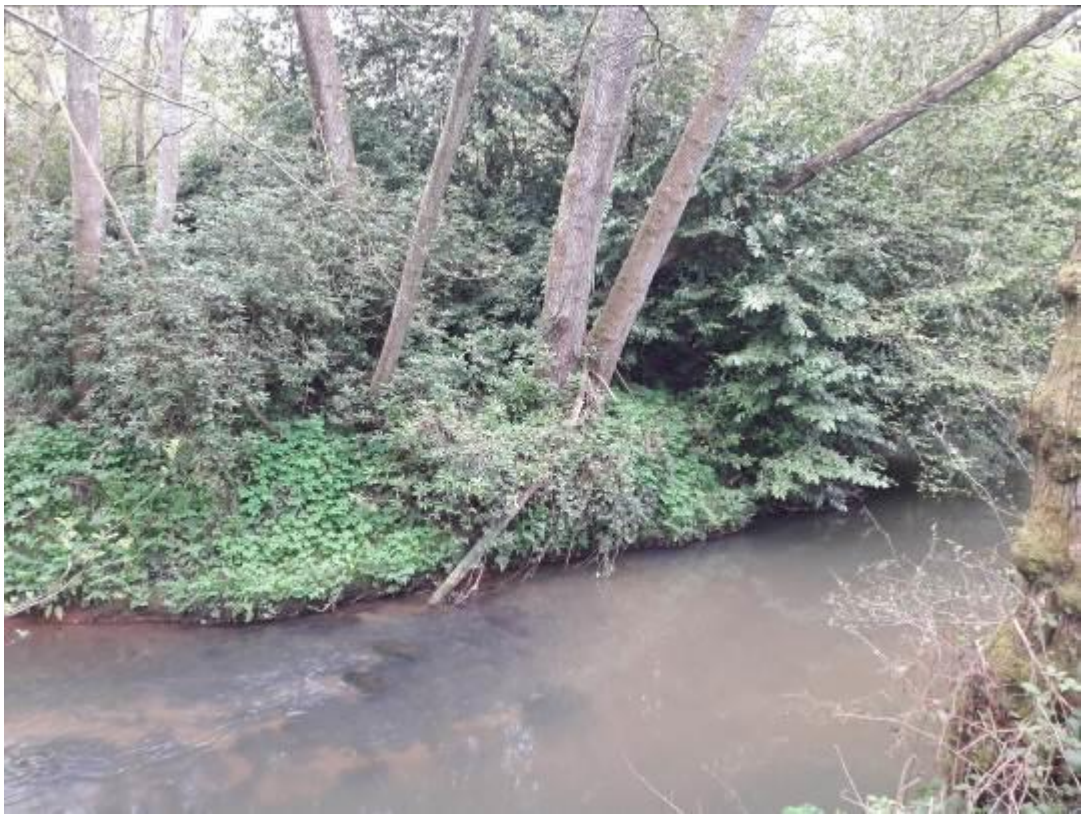


Photo 25. What appears to be either laurel or rhododendron bushes overhanging the river margins. Both of these plants are known to have toxic leaves and are not considered to be appropriate river-side shrubs.

Although not considered to be a serious issue at Fair Oak, there were examples of excessive bank poaching, particularly towards the Habin Bridge end of the fishery (photo 26). Bank trampling on this scale results in the input of fine sediments into the channel. This is of particularly concern when the bank poaching is occurring immediately upstream of potential spawning sites, where

the presence of fine sediment particles can infiltrate into spawning redds, reducing egg viability and impacting on wild trout recruitment.

Re-grading the bank and lining the bed with importing cobbles and gravels to make purpose built livestock fording and drinking bays would definitely help to reduce sediment input in this area. DEFRA have recently released new guidance relating to bank poaching pressures.
www.gov.uk/guidance/rules-for-farmers-and-land-managers-to-prevent-water-pollution

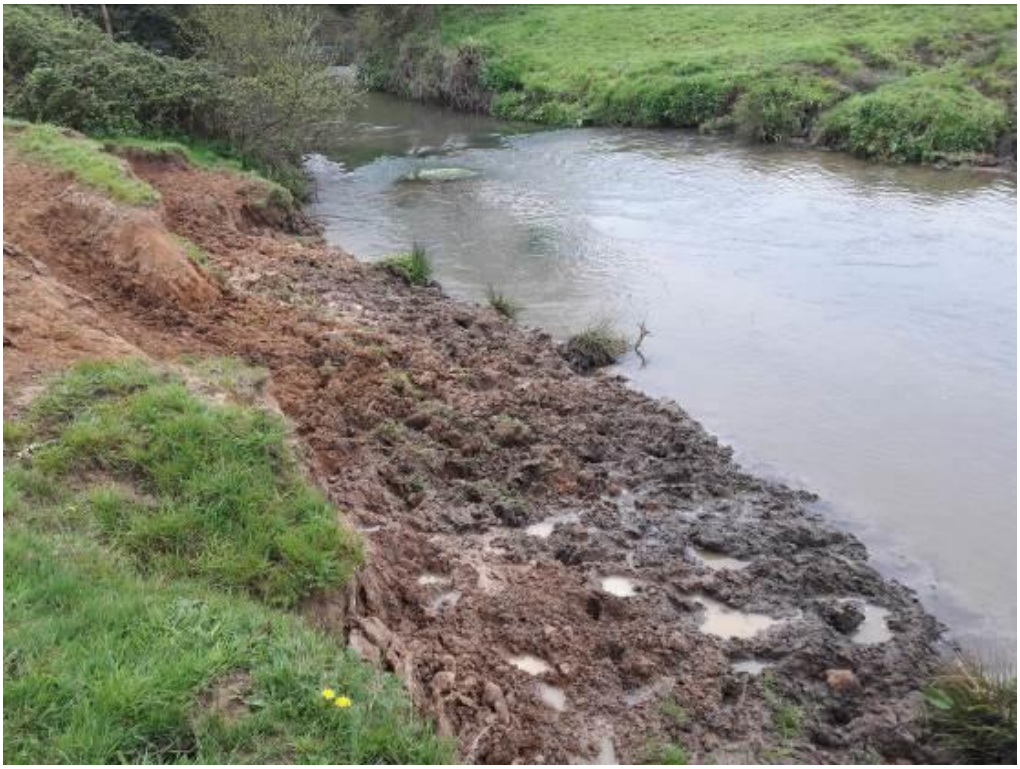


Photo 26. Heavy bank poaching can potentially result in reduced egg to fry conversion rates in any spawning sites located in the downstream vicinity.

4.0 Stocking

Whilst many land owners, clubs and commercial fisheries still stock rivers and streams with domesticated farm-reared trout, 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 is usually necessary and can be challenging.

The following generic text 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.

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.

The artificial mating that occurs within hatcheries bypasses vital chemical and visual aspects of mate selection; a process that ensures mate compatibility and maximises the fitness of wild fish. Stocked fish (both diploid and triploid), are also affected by domestication and 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. This poor survival is also why, even after a long history of stocking, the genetic integrity of the wild population often remains intact and, after cessation of stocking, the farmed fish genes are often quickly bred out of a population. 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. 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 underperforming 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, territories 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 areas 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 stocked in previous years 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 from any impact of stocking but increased catches of juvenile trout are often reported from year one.

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

On this stretch of the Rother, it was interesting to see that the wild trout sampled by my colleague Theo was almost exactly the same size as the stocked trout which were due to be introduced within a few days of this Advisory Visit. This implies that the river is already capable of producing wild trout of a good stamp, and could probably produce significantly more if issues like bank poaching and low level cover for juvenile trout were implemented.

Wild trout populations would undoubtedly benefit from a cessation to stocking altogether but if trout stocking is to continue at Fair Oak then it is recommended that perhaps the Syndicate should experiment with the stock densities and frequency of introduction. Very often reduce stocking densities result in better

returns. 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 a radical re-think is required.

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 anglers' 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 flee 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 could 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.

3.0 Conclusion

The middle reaches of the Rother at Fair Oak support an attractive and diverse environment. Habitat quality for flow-loving, gravel spawning fish species is at a premium but we do know that where habitat quality is favourable the river can and does support a good quality fishery.

The majority of wild trout, grayling and coarse fish that reside within the Rother at Fair Oak are almost certainly migrating to utilise comparatively small areas of high quality habitat found in the middle reaches below Habin Bridge. Making sure that these areas are in optimum condition will help to boost the size of the wild population.

The impoundment at Trotton Mill is responsible for adversely impacting on habitat quality on the lower 0.5km section of channel. It will also be restricting access for both brown and migratory sea trout in any low-flow autumn. The historic nature of the structure is problematic but all structures fail eventually and a dialogue with the owners should be opened in case there is ever an opportunity for modifications that could see an improvement for both sediment transport and the free migration of fish.

The retention of complex, well covered habitat throughout the fishery is important and even more so adjacent to any potential spawning sites (shallow gravel runs). Managing trees so that more direct light can reach the bed of shallow sandy glides will help with weed growth and general productivity. Maintaining tree shade and cover, particularly low cover that kisses the surface of the water over any deeper pool habitat, or on the outside of bends is also very important and will encourage adult fish to hold station. A 50:50 ratio of dappled light to shade should be the target and is probably close to what the river supports at present. Ensuring the shade and light are in the right places will take planning and time.

Effective management of the trees and woody material will help to create improved habitats for fish and opportunities for the rods. It is essential to retain as much low-level, fallen and trailing woody material as possible, so the key message is to "move it, improve 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. Further guidance on how to manage habitat through the imaginative use of woody material can be found on the WTT website at www.wildtrout.org

Agricultural diffuse pollution is a massive issue in the Rother catchment. Engaging with and encouraging local farmers and estate tenants to leave wider uncultivated field margins and to intercept sediment pathways can make a huge difference in helping to keep soils and bound-up nutrients on the land, rather than in the river. Simple measures such as fenced buffer zones, successional tree planting, contour ploughing and relocating gateways away from the bottom slopes of arable fields can all help to reduce diffuse pollution pressures.

In areas where the soft banks have failed and collapsed it is recommended to plant up the toe of the bank to add stability. This will help to create a marginal habitat and also a safe, low vantage point for angling for those that find wading difficult. 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 areas, 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 and create cover but will need maintenance and may not be universally popular in areas where angling access is required. For a high quality wild fishery to be established it is essential to prioritise habitat favoured by the fish over one where the angler might feel comfortable. Providing occasional safe entry and exit routes for wading anglers is preferable to trying to maintain a clear margin for bank angling access. 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 everyone but offers the angler an intimate experience with the river and with a stealthy approach can be very effective. The comparatively turbid water coupled with very high banks and comparatively impoverished fly life can make the Rother a challenging environment for all but the most experienced of anglers. For those who are prepared to don a pair of chest waders and slip into the channel and fish amongst the natural woody features for wild browns then the experience can be truly magical.

A review of the overall objectives for the fishery would be wise. The Rother does not naturally lend itself to the classic Victorian model for a stocked riverine trout fishery. Reducing, or ideally stopping stocking altogether, will reduce competition and predation pressures on wild stocks, save money and allow the wild component of the stock to flourish.

4.0 Recommendations

- Take a relaxed approach to fallen woody material. Only move it and re-secure it when it is essential to avoid excessive bank erosion. The WTT can help with a training day via a WTT Practical Visit (PV).

- Consider coppicing marginal leggy alders to preserve root systems and promote low bushy cover.

- Consider planting some low scrubby tree species, or emergent reed sods into the toe of slumped river banks to create improved holding opportunities for adult trout. Concentrate on areas with access to direct sunlight.

- Coppice out clumps of trees that are heavily shading shallow glide habitats to win more sunlight and promote improved weed growth.

- Discuss measures designed to reduce diffuse pollution pressures with the local farmers.

- Consider monitoring water quality via invertebrate surveys, especially just downstream of the Rogate Waste Water Treatment Works. Training is available.

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

- Consider a complete cessation of stocking in favour of the development of a wild fishery. Re-evaluate the model for how the fishery is to be managed. This section of upper Rother lends itself to a truly wild trout fishing experience – a desirable and comparatively rare commodity in the south east of England

- 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.

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

- 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.

- Attempt to take most of the stocked trout out towards the back half of the season.

5.0 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.