# Upper East Stour, Monks Priory, Kent

**Advisory visit May 2016**

## Key Findings

- This headwater stream of the East Stour River at Monks Priory supports good quality habitat for brown trout *Salmo trutta*.
- The ecological quality of the target section may have been adversely impacted by the removal of tree shading and root systems from a substantial length of channel in the reach above.
- The reach inspected supports a varied river-bed topography and a meandering planform, providing good opportunities for all brown trout life-stages, as well as other gravel spawning fish species.
- Many of the river-side trees are mature alders and some rotational coppicing is required to create more diversity in the canopy, including the provision of low-level shading.
- Opportunities exist to create biologically rich margins by lowering the bank height in selected locations and restricting access for grazing livestock through targeted river bank fencing.
- The provision of small, connected back-water habitats can be critically important for supporting certain invertebrate, plant and fish species and will help to improve the overall biodiversity of the site as a whole.

## 1.0 Introduction

This report is the output of a site visit to a headwater stream making up one arm of the East Stour River at Monks Priory, near Sellindge in Kent. The request for the visit came from Mr. Adrian Birth who has been contracted by the land owner to undertake environmental and aesthetic enhancements to the various waterbodies located within the estate boundary.

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.

| | **Stream at Monks Horton** |
|---|---|
| **River** | East Stour River |
| **Waterbody Name** | Upper Stour (Kent) |
| **Waterbody ID** | GB107040019640 |
| **Management Catchment** | Great Stour |
| **River Basin District** | South East |
| **Current Ecological Quality** | Unassessed |
| **U/S Grid Ref inspected** | TR107395 |
| **D/S Grid Ref inspected** | TR104392 |
| **Length of river inspected** | 0.5km in total |

**Table 1. Overview of the waterbody. Information sourced from**
**http://environment.data.gov.uk/catchment-planning/WaterBody/GB107040019640**


Map1. Upper East Stour River at Monks Priory

## 2. Catchment Overview

The Kent Stour is formed from several headwater streams that eventually join in Ashford to form the Great Stour. The upper reaches of the catchment run through a mixed geology of greensand and gault clays but below Ashford the river starts to run through the Kent chalk, picking up groundwater and taking on the characteristics of a true chalk stream.

Unlike some of the chalkstreams further west, the Great Stour is heavily influenced by the comparatively flashy nature of its headwater streams, compounded by the large conurbation of Ashford. Flows can therefore be much more variable than on many true chalkstreams, with the river experiencing spate conditions following heavy rainfall but also suffering from acute low flows following long dry spells. It is likely that a large proportion of the dry weather flow is made up of treated effluent emanating from waste water treatment works found further upstream.

Significant groundwater abstraction pressures are also likely to impact flows and therefore habitat quality on some sections of the river. The WTT does not have specific information regarding those pressures although more information will be available from the Environment Agency through their Catchment Abstraction Management plan for the Stour catchment.

As well as brown trout, the river also supports a significant run of sea trout which are known to migrate as far upstream as Chilham in wet autumns. Inadequate fish passage restricts the opportunities for these fish to penetrate up into the headwaters of the catchment.

Mixed coarse fish and good numbers of eel are also found on many stretches of the Great Stour. Further upstream it is believed that white clawed crayfish (*Austropotamobius pallipes)* are still to be found in the Western arm of the river, making this river one of the last strongholds for native crayfish in the south of England.

## 3. Habitat Assessment.

The stream at Monks Priory can be very roughly divided into two sections. The upper section appears to be largely unmodified and enjoys a natural meandering planform with a valuable pool/glide/riffle sequence that is synonymous with high quality trout habitat. The banks in this upper section are lined with mainly mature alder trees *Alnus glutinosa* (cover photo) which provide excellent bank protection via the extensive root systems, as well as high quality refuge areas for fish. This is particularly important in lowland greensand streams, where in-channel cover is often limited.

In the reach immediately upstream of the Monks Priory water there has been some recent in-channel dredging work which has included the removal of large numbers of trees, including their root systems (photo 1). Presumably this work was undertaken by the neighbouring land owner, or tenant in an attempt to improve local land drainage. This potentially damaging work will have resulted in notable destabilisation of the banks and large quantities of fine sediment being

mobilised which will impact upon habitat quality within the Monks Priory reach. Any mobilised sediment that then settles onto shallow gravel runs can catastrophically impact on fish spawning success by filling the gravel matrix with fine sediment and potentially smothering fish eggs, resulting in poor egg to fry survival rates and degrading invertebrate and plant habitats. Hopefully any damage incurred as a result of the redistribution of fine sediment at Monks Priory will be temporary as silt is gradually moved on by natural river processes; however, any long-term bank destabilisation could create an ongoing issue.

Unfortunately, the work undertaken upstream will also be resulting in the stream warming up. Tree shading is very important for small streams and is particularly important for species like brown trout that require cool, well oxygenated water. Research carried out by the Forest Commission and others has clearly identified how even comparatively short sections of tree shading can help to moderate water temperatures in flowing streams. Conversely, wholesale tree removal can result in a warming effect, especially under low flow conditions, with the stream less able to retain the high levels of dissolved oxygen required to sustain a trout population.

It was noted that the bed of the river in this upper section was completely devoid of any submerged aquatic plants. The heavy shade cast by the long stands of alder trees may be one reason why weed growth is poor, however, sediments washed down from above may also be temporarily restricting weed growth. Another factor could be the local water chemistry, as there was evidence of iron rich groundwater seeping into the toe of the bank at several locations (photo 2). The ochre emanating from iron rich springs is entirely natural and is associated with the underlying local geology. Iron rich streams tend to be slightly acidic in nature and are generally not as biologically rich and productive as streams fed from limestone or chalk.

Photo 1. The section upstream has been badly degraded by the wholesale removal of all tree cover, including root systems.

Photo 2. Iron rich groundwater source adjacent to the stream.

Meadows adjacent to the left bank are being used for grazing livestock. There was evidence of excessive grazing pressures (photo 3) which is impacting on bank-side plants, reducing their capacity to provide a biologically rich river margin, as well as leaving the banks more vulnerable to increased river erosion pressures. Excluding grazing animals from selected sections of sensitive river bank via targeted stock fencing will help the margins to develop a more diverse and healthy range of plants. This in turn will provide improved habitats for invertebrates and ultimately more food for fish, while also stabilising the bank.

When contemplating the creation of river-side buffer zones, where considerations are being given to excluding access for livestock, it is important to plan for future maintenance. Without any grazing or maintenance work, banks will eventually revert to thick scrub. Whilst some river-side scrub is considered to be valuable habitat, particularly in providing potential lying-up habitat for otter *Lutra lutra,* as well as creating low over-hanging cover for fish, too much will cast dense shade over the channel and shade out aquatic plants. For this reason, it is sometimes worth considering the creation of deeper buffer zones with gated access so that very light occasional light grazing can be facilitated. This may also allay any fears over losing any stewardship grants as land is still available for occasional grazing. If grazing is to be undertaken, it is very important to ensure that it is only very light and occasional, and that none is undertaken in the first 5 years to allow the herbaceous vegetation and saplings to become established; otherwise they will be preferentially browsed off at an early stage of development.

Photo 3. Marginal sedges are considered to be very good for bank protection and providing habitat for invertebrates. Less nibbling will result in a thicker fringe developing.

In some areas, there is evidence that marginal alder trees have been previously coppiced. Consideration should be given to carrying some further light coppicing work to introduce some variety into the height of the tree canopy and also to preserve the life of some of the stands. A good example is where a tree is in danger of being washed out and the root system exposed (photo 4 & 5). Coppicing the tree on the mini island will reduce the risks of this particular tree falling over and causing a full-width debris dam from forming. Again, this should only be undertaken after exclusion of livestock, otherwise you will simply lower the canopy into their reach.

Fallen woody material is incredibly important in supporting the development of a healthy stream and therefore should be retained whenever possible. Almost all woody material in streams is derived from trees located within the riparian corridor. Streams with adequate woody material tend to have greater habitat diversity, a natural meandering shape and greater resistance to high water events. Therefore, woody material is an essential component of a healthy stream's ecology and is beneficial in maintaining the diversity of biological communities and physical habitat.

Traditionally, many land managers and riparian owners have treated wood in rivers and streams as an untidy nuisance and have removed it, often with detrimental consequences. Stream clearance can reduce the amount of organic

material necessary to support the aquatic food web, remove vital in-stream habitats that fish will utilise for shelter and spawning and reduce the level of erosion resistance provided against high flows. In addition, LWD improves the stream structure by enhancing the substrate and diverting the stream current in such a way that pools and spawning riffles are likely to develop. A stream with a varied bed containing pools and riffles is ideal for benthic (bottom dwelling) organisms and is ideal for supporting a trout population.

Photo 4 & 5. The alders in the centre of the channel should be coppiced to preserve the tree and root systems.

There were some good examples of shallow, gravel-lined runs, which potentially can provide high quality spawning opportunities for a range of fish species, including trout. Much of the gravel appeared to be covered in a thin layer of fine sediment and as previously discussed, this may be due, in-part, to issues further upstream. Trout spawning success can be enhanced on sites like this with a few hours of work undertaken just prior to trout spawning season in the November to January period. Raking the gravels to reduce the fine sediment loads can significantly help to boost spawning success.

Further information on exactly how and where to undertake gravel cleaning can be found on the Wild Trout Trust website, including instructional videos.
http://www.wildtrout.org/search/node/Gravel%20cleaning

Photo 6. A potential spawning site coated in fine sediments.

In the reach towards the lower boundary there are opportunities to create some connected back-water habitat. Although not especially valuable for trout, connected back-waters are important habitat features for a range of other fish species, including juvenile coarse fish and eels. Digging out the mouths of connected ditch systems, or creating bespoke bays, where small fish can migrate

out of the main stream flow, can provide improved habitat on many spatey, lowland streams and rivers.

Any work to the stream bed, or within 8 meters of the top of the bank on a river classified as a "main" river by the Environment Agency will require a consultation and potentially a permit under the new Environmental Permitting Regulations. This is a comparatively new system, replacing the old Flood Defence Consenting process. The EA should be consulted on any consents needed at this particular site.

A cursory inspection of the stream bed revealed the presence of several species of invertebrate, including freshwater shrimp *Gammarus pulex* and olive nymphs *Baetis* sp. These invertebrate species are sensitive to pollution pressures and are therefore extremely useful as a water quality monitoring tool. There is a national network of voluntary water quality monitors who regularly carry out invertebrate surveys under the guidance of the Riverfly Partnership. Members of the partnership survey their local rivers and streams and they have proved incredibly useful in helping to detect problems at an early stage and notify the EA that there is potentially a problem requiring urgent action.

## 4. Conclusions

The stream at Monks Priory is a delight and supports some high quality habitat for a range of fish and invertebrate communities. The key to improving the stream further is to engage with upstream neighbours to encourage a more sympathetic maintenance regime. Ensuring that long reaches are protected from over-zealous maintenance work in future will help the stream to become more resilient during times of drought and flood.

Habitat in the Monks Horton reach can be enhanced further by working with the natural river processes, avoiding the desire to be too tidy and allow woody material to be left in situ. A good rule of thumb is to move, rather than remove woody material so that it does not form a full channel width dam, and even then, only where absolutely necessary. Natural logjams and woody material accumulations provide valuable habitats in their own right and also naturally help to attenuate peak flows and mitigate flooding d/s. Protecting the banks from excessive grazing pressures via the creation of fenced–off buffer zones and promoting a dappled light and shade regime via selective coppicing will also help to stabilise vulnerable banks and encourage a wider range of species to flourish.

On sections where in-channel cover is scarce, consider introducing woody material to create cover and promote bed scour. 'Cover' logs popped in parallel to the flow and adjacent to the toe of the bank can also encourage trout to take up residence in open, shallow environments. The principle of the cover log is that there is a gap underneath where trout can safely hide from predators but also safely nip out into the flow to intercept passing food items. To be effective they need to be positioned adjacent to the margin that carries the majority of the flow velocity. A cover log is shown up on the bank ready for deployment in photo 7 and how they should look once installed into the channel, mimicking an undercut bank (photo 8). Simple brushwood bundles installed (photo 12) in similar fashion are also hugely effective, especially on sections immediately downstream of known spawning sites.

Explore options for creating shallow connected backwater habitat, either in the mouths of existing connected ditch systems, or by lowering the bank to create new opportunities. These backwaters are often transient habitats and will rapidly fill with sediment and therefore will require occasional maintenance work to insure they continue to work over a range of flow conditions.

Photo 8. Cover log sat up on two woody rings cut from the end of the log, drilled and ready to be pinned to the bed with steel re-bar.

Photo 11. Correctly installed parallel to the flow and tight against the river bank.

Photo 12. A simple brushwood bundle wired to a driven chestnut post providing cover for newly hatched trout fry in a shallow gravelly margin.

## 5. Recommendations

- Encourage rougher, more naturalistic river margins to develop by reducing bankside grazing pressures. This can be achieved via permanent or temporary fencing and will help to protect the banks and provide habitat for fish and the food of fish. It must be ensured that any subsequent grazing does not compromise the establishment of herbaceous vegetation and shrubs.

- Engage with your upstream neighbour over methods for managing the stream and banks.

- Coppice occasional stands of mature alder to preserve the life of long, leggy trees, particularly those with exposed root systems.

- Consider planting low, overhanging trees and bushes to provide enhanced cover. Species like goat willow *Salix caprea* and thorns are particularly good at proving cover at water level.

- Introduce woody material to the channel to promote bed scour/sorting and provide cover. Use large woody material to promote bed scour, parallel cover logs for adult trout cover, and brushwood for enhanced fry and parr cover.

- Consider attending a training course in river-fly monitoring. This will potentially enable some self-monitoring of local water quality via a simple assessment of the presence or absence of key aquatic invertebrates. For further information visit www.riverflies.org

- Engage with the local EA office to explore the options for creating connected back-waters on the Monks Horton estate.

- The WTT can potentially help with a Practical Visit. Further details are available on our website:

  http://www.wildtrout.org/content/river-habitat-workshops-and-practical-visits

## 6. 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 WTT is able to provide

further advice and information as required. Further advice on fund-raising can be found at http://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 http://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: http://www.wildtrout.org/content/index

## 7. Acknowledgement

The Wild trout Trust would like to thank the Environment Agency for their continued support of the advisory visit service.

## 8. Disclaimer

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