



River Colne – Staines Moor



An advisory visit carried out by the Wild Trout Trust – May 2012

1. Introduction

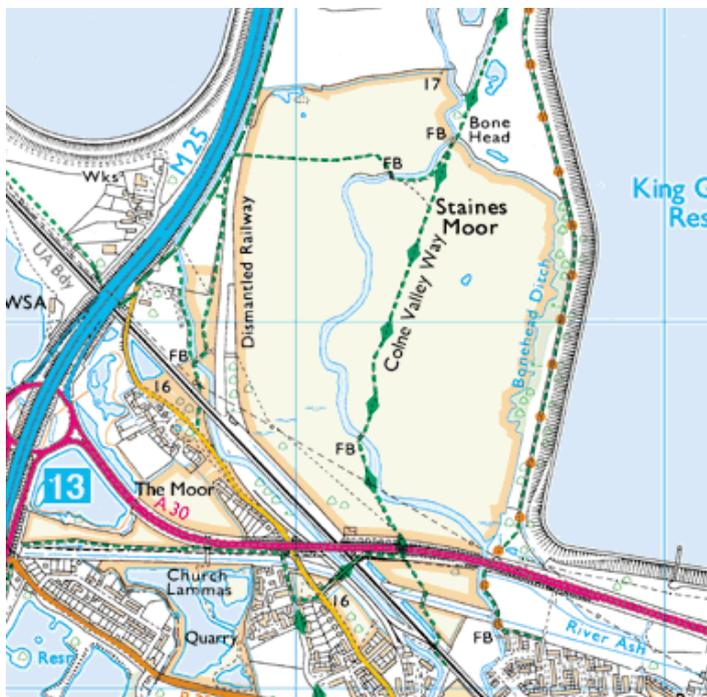
This report is the output of a Wild Trout Trust advisory visit undertaken on stretches of the River Colne and Wraysbury River located on Staines Moor in Middlesex, NGR TQ 034735 down to TQ 034724.

Staines Moor is a designated Site of Special Scientific Interest because of its importance to nature conservation. It is one of the largest areas of neutral grassland in England that has not been extracted for gravel or agriculturally improved. The Moor and the River Colne attract wildfowl and waders including ruff and golden plover in winter. Other wildlife which can be seen around the Moor include kingfishers, skylarks, lapwings, butterflies, dragonflies and damselflies, as well as a wide range of wildflowers and grasses. The Moor is home to 200-year-old yellow meadow ant hills - the oldest recorded in Britain.

The request for the visit was made by Mr. David Hicks, who is the Biodiversity Officer with Spelthorne Borough Council. Mr Hicks is responsible for the management of the reserve and he is keen to explore opportunities to improve the river environments on the reserve to help meet objectives for enhancing the nature conservation value of this important site.

Comments in this report are based on observations on the day of the site visit and discussions with Mr. Hicks.

Throughout the report, normal convention is followed with respect to bank identification i.e. banks are designated Left Bank (LB) or Right Bank (RB) whilst looking downstream.



Staines Moor

2. Catchment overview

The River Colne rises in springs near North Mimms in Hertfordshire and flows south east to join the Thames at Staines. The Colne is an extensively modified river system and has been extensively re-engineered for navigation, water supply, flood defence and to provide water via the artificial Longford River to supply ornamental water features in Bushey Park. The catchment is heavily urbanised but despite all the extensive pressure on water resources and water quality, the Colne surprisingly still supports some good quality habitat suitable for flow loving, gravel spawning fish species.

The main River Colne shares some of the chalk stream characteristics associated with its tributary, the River Chess. Low banks and stable flows characterise chalk fed river systems. The Colne flows mainly through a geology of alluvial clays, sands and gravels, however the chalk influence is still evident even on the lower reaches of the Colne.

A summary taken from the Environment Agency's River Basin District Plan suggests that the Colne has significant water quality issues. Classified as a heavily modified waterbody, it would seem an unrealistic target to aim for the Colne to sustain a healthy and viable wild trout population. That said, there is ample opportunity to improve in-channel and riparian habitat to support an improved coarse fish population. Many of the techniques that have been developed by the WTT to help improve trout populations will also benefit a wide range of indigenous coarse fish species.

Colne and GUC (from confluence with Chess to Ash)		
Waterbody ID	GB106039023090	
Waterbody Name	Colne and GUC (from confluence with Chess to Ash)	
Management Catchment	Colne	
River Basin District	Thames	
Typology Description	Low, Medium, Calcareous	
Hydromorphological Status	Heavily Modified	
Current Ecological Quality	Moderate Potential	
Current Chemical Quality	Fail	
2015 Predicted Ecological Quality	Moderate Potential	

2015 Predicted Chemical Quality	Fail		
Overall Risk	At Risk		
Protected Area	Yes		
Number of Measures Listed (waterbody level only)	2		

3. Fishery overview

The Colne and Wraysbury River at Staines Moor have not been actively managed as fisheries. Spelthorne BC are currently discussing possible options to lease the fishing rights to a local club for coarse angling.

The river channels at this location have very different characteristics and both channels have considerable scope for habitat enhancement. The Wraysbury River is a man-made loop of the Colne and runs parallel to the Colne along the Western boundary of the Moor. Habitat quality and availability are discussed in more detail in the section below.

It is unrealistic to aim for the development of habitat capable of sustaining a recruiting wild brown trout *Salmo trutta* population on either channel. The lack of gradient means that the channel cannot drive the water velocities necessary for maintaining habitat suitable for successful trout spawning. Water quality is also likely to impact on the chances of establishing a viable wild trout population. That said, there are short sections of the Wraysbury River where the channel is pinched, promoting sufficient water velocities to sustain suitable habitat for a range of flow loving fish species.

The Colne valley is noted for rich deposits of alluvial gravels and where these deposits have been swept clean by locally increased flow velocities there are examples of high quality habitat. Realistically the target species for the Colne and Wraysbury River should be native, gravel substrate spawning species such as chub, dace, barbel, gudgeon and bullhead, as well as macrophyte and root system spawners like perch, pike and roach. Ensuring there is good access for eel is also very important, particularly on a designated site where wading birds are important. Provided long term goals for improving water quality can be met, then there is no reason why the site might not support occasional adult brown trout.

4. Habitat assessment

4.1 Wraysbury River

Some good quality habitat for flow loving and gravel spawning fish species was evident on the Wraysbury River. The comparative lack of any significant gradient on both channels is a major limiting factor. This issue is compounded by the presence of substantial weir structures, with a crump-type flow gauging weir

(photo 1) located on the Wraysbury and a large impoundment located on the main Colne downstream of Staines Moor.



Photo 1 EA gauging weir which significantly impacts on fish passage and habitat quality on the section upstream of the structure.

Long sections of the Wraysbury River are characterised by uniform flat glides running over a gravel and fine sediment river bed. In some areas where there are slight fluctuations in channel shape and form, good habitat has established, especially where sufficient light penetration reaches the channel bed promoting valuable macrophyte growth. Emergent species like water crowfoot *Ranunculus spp.* are particularly valuable. They provide good habitat for specialised aquatic invertebrates, and excellent cover for fish. Water crowfoot and starwort *Callitriche sp.p* are plants synonymous with high quality river habitats.

Some good examples of in-channel habitat diversity were evident. One such site was located adjacent to an access bridge on the south side of the Moor, where the channel has been squeezed by foot bridge abutments (photo 2) with a wide, shallow fording bay immediately downstream. The site already provides opportunities for roach spawning on the well established crowfoot beds but could be improved for substrate spawners through the introduction of fresh gravels on the shallow runs immediately above and below the bridge. Sites like this are potentially valuable for coarse fish, especially where there are spawning opportunities immediately upstream of optimum fry habitats. Ensuring that different fish life stage habitat is connected is an area often neglected in river management and maintaining optimum habitat for juvenile fish immediately downstream of potential spawning sites should be a priority.



Photo 2. A wide shallow bay (ford) below a potential spawning site – good habitat for coarse fish

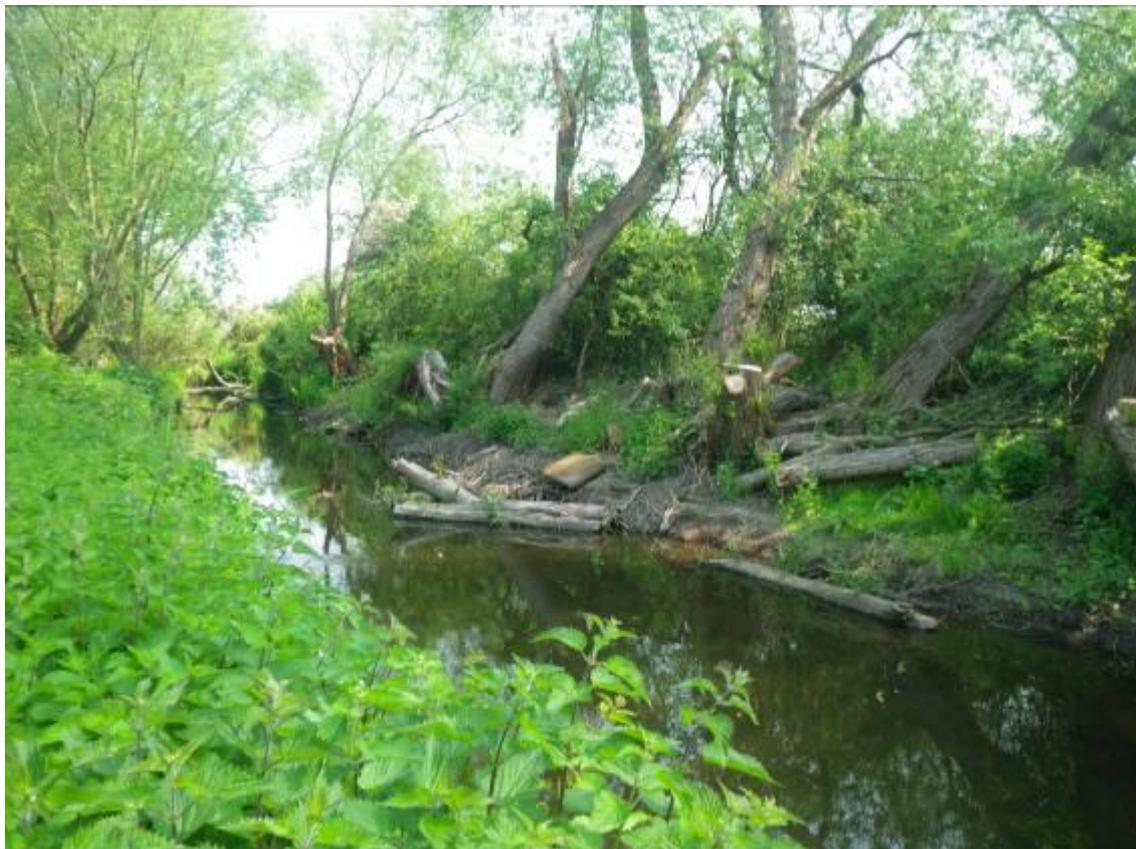


Photo 3. Recent tree works to let in more light. Further opportunities exist to use the woody material to create improved in-channel habitat.

A short distance above the footbridge, work has recently been undertaken to coppice and pollard river margin trees to open up the canopy and allow more light to reach the channel (photo 3). Some of the woody material has been deliberately left in the channel and this has provided some excellent diversity and cover in what would otherwise be an extremely flat and sterile channel. The extra light reaching the channel should in time promote increased in-channel macrophyte growth and provide much needed cover and variations to flow patterns. Large woody debris (LWD) that is currently in the channel should be secured and configured to maximise benefits, both as flow deflectors to promote bed scour and also as parallel shelves, providing a food source for grazing invertebrates and cover for fish.

More information on how to effectively use LWD to create improved in-channel habitat can be found on the WTT website in a range of publications including the latest version of the Wild Trout Survival Guide, the Chalk Stream Habitat Manual, or as simple individual pdf habitat management sheets. All can be found at: <http://www.wildtrout.org/content/wtt-publications>

A short distance upstream the channel is more open to direct sunlight and some good habitat is available for coarse fish via low scruffy margins and beds of strap weeds such as the submerged burr reed *Sparganium sp* in photo 4.



Photo 4. Good cover for fish of all sizes from fry in the margins to larger fish in amongst the weed and low overhanging shrubs and trees

Beds of marginal emergent plants that protect the banks and squeeze the channel help to sweep soft sediments away from central channel locations. Where these reed/rush beds form, they can provide a valuable role in kicking the flow from one side of the river to the other (photo 5). Reeds, particularly the emergent form of burr reed and club rush *Schoenoplectus lacustris* can sometimes grow vigorously in central channel locations, especially on low energy rivers. When this happens there is the danger the channel can become clogged, raising water levels and generally slowing upstream water velocities. Encouraging the plants to grow well in the margins and discouraging them from completely blocking the channel often requires sensitive management intervention.



Photo 5. A bed of emergent burr reed adjacent to the LB and then a bed of reed canary grass *Phalaris arundinacea* below on the opposite bank providing good habitat, particularly for the adult life stages of many aquatic invertebrates and performing a valuable role as natural flow deflectors. Maintaining a balance like this sometimes requires intervention.

In the reach running downstream from the gauging weir the river supports some excellent habitat for flow loving coarse fish and potentially for trout (photo 6). The gradient in the river at this location promotes some valuable riffle habitat over a mainly clean gravel bed. In places the tree canopy is extremely thick (photo 7) and punching some holes to allow some dappled light to hit the river bed would be beneficial.



Photo 6. Excellent habitat for flow loving fish species including brown trout



Photo 7. Some "skylighting" is required to let in some light to the channel and provide a valuable habitat like the one pictured above.

4.2 Colne (main channel)

Habitat quality in the main Colne river channel as it traverses the Staines Moor varies considerably. Near the upstream boundary of the site the river channel is comparatively narrow and characterised by dense willow cover down the LB margin (photo 8). It is highly likely that this section of channel has been heavily modified and intensively managed up until the last decade or so and since then has received virtually no maintenance. There is evidence throughout the reach that the river channels have been extensively dredged, leaving a deeply incised channel in places. The encroaching willow cover provides excellent cover for fish from predation pressures but plans need to be formulated to ensure that the upper reaches do not get completely shaded over by willow growth. Cutting back some of the overhanging growth so that 50% of channel is available for light penetration would be a good target to aim for. The willow material that has fallen into the channel and is partially submerged is particularly valuable and should be retained if possible.



(Photo8) Top end of the main Colne at Staines Moor. Some light tree maintenance is required.

A short distance downstream there is an off-take structure on the LB (photo 9) feeding water into the Bonehead Ditch, which is a small loop off the main Colne taking water around the eastern boundary of the Moor. The water control structure is derelict and has no useable control mechanism. Water appeared to be breaching around the side of the structure and there is considerable risk of complete failure which would result in significantly more flow entering the ditch at the expense of the main channel.

An inspection was made of the Bonehead Ditch and, like the upper reaches of main channel, this channel has been largely unmanaged for a significant number of years. In places, where there is light penetration, the channel is completely clogged with emergent plants (photo 10). In others, the channel is dominated by a tangled mass of willow (photo 11). Additional flows running through this particular environment is unlikely to be rewarded with increases in biodiversity.



Photo 9 Water bypassing the control structure feeding water into the Bonehead Ditch.

Currently, significant quantities of water feed into the Bonehead Ditch but habitat opportunities are restricted to plants and animals that simply require a wet environment, rather than flow. Splitting the water resources into three separate parallel channels has a significant impact on the potential for any one of the channels to become a high quality habitat for flow loving fish, plants and invertebrates. It would be comparatively easy to repair the structure but some thought needs to be given as to where the priority species and habitats lie within the channels and riparian zones and how they should be managed in the future. A simple water level management plan is required to identify where the priorities are and how to obtain a hydrological regime that maximises opportunities for biodiversity.

Advice obtained from the WTT is bound to reflect our passion for maintaining high quality in-channel habitat for flow loving species. It is not surprising therefore that we would recommend consolidating the majority of the flow into the main River Colne and manage the Bonehead Ditch as a linear still water.



Photo 10 A section of the Bonehead Ditch open to light penetration



Photo 11. A typical section of the Bonehead Ditch hidden under a thick canopy.

Habitat quality on the main Colne channel running across the Moor has been heavily influenced by previous dredging works and past intensive grazing pressures. Grazing regimes are now strictly controlled to maximise the biodiversity potential of the Moor. However, the channel and indeed the land adjacent to the river are still suffering from the legacy of past management.

Long reaches of the main river are extremely wide and comparatively shallow and in the upper reaches there are hard bunds on the top of the bank, presumably made up of previously dredged river bed material. This is particularly evident adjacent to the RB, where the river is completely disconnected from the adjacent flood plain for long sections. On one section, the in-channel habitat quality is greatly enhanced by the presence of an island (photo 12) which has provided a valuable habitat in its own right as well as squeezing the flow through two narrow channels either side, providing some much needed diversity in the local flow regime. The remains of the old river bed are clearly visible on the raised bunds on both banks.



Photo 12. A valuable island creating much needed habitat diversity

Great care needs to be taken when deciding how to deal with the raised banks. Currently the bunds will limit the frequency of inundation of the adjacent flood plain but may also affect how quickly the meadows drain following a large flood. Weighing up the costs and benefits of changing this regime is crucially important on a protected site and further investigations are needed before opting for any change.

A key characteristic of the river running through the Moor is the wide, open nature of the channel and lack of any significant shading. The lack of any tree shading may be a legacy of the free grazing regime and may also complement the very reasons why the Moor is classified as a rare and important habitat. The lack of any low scrubby cover is problematic for any fish populations wishing to reside within the channel. If tree planting is undesirable then cover could be provided by importing fallen trees, including root balls and branches, and simply dragging them into the channel margins and anchoring them in place. This would be particularly valuable on top of the extensive shallow sections that potentially could provide excellent habitat for coarse fish fry (photo 13).

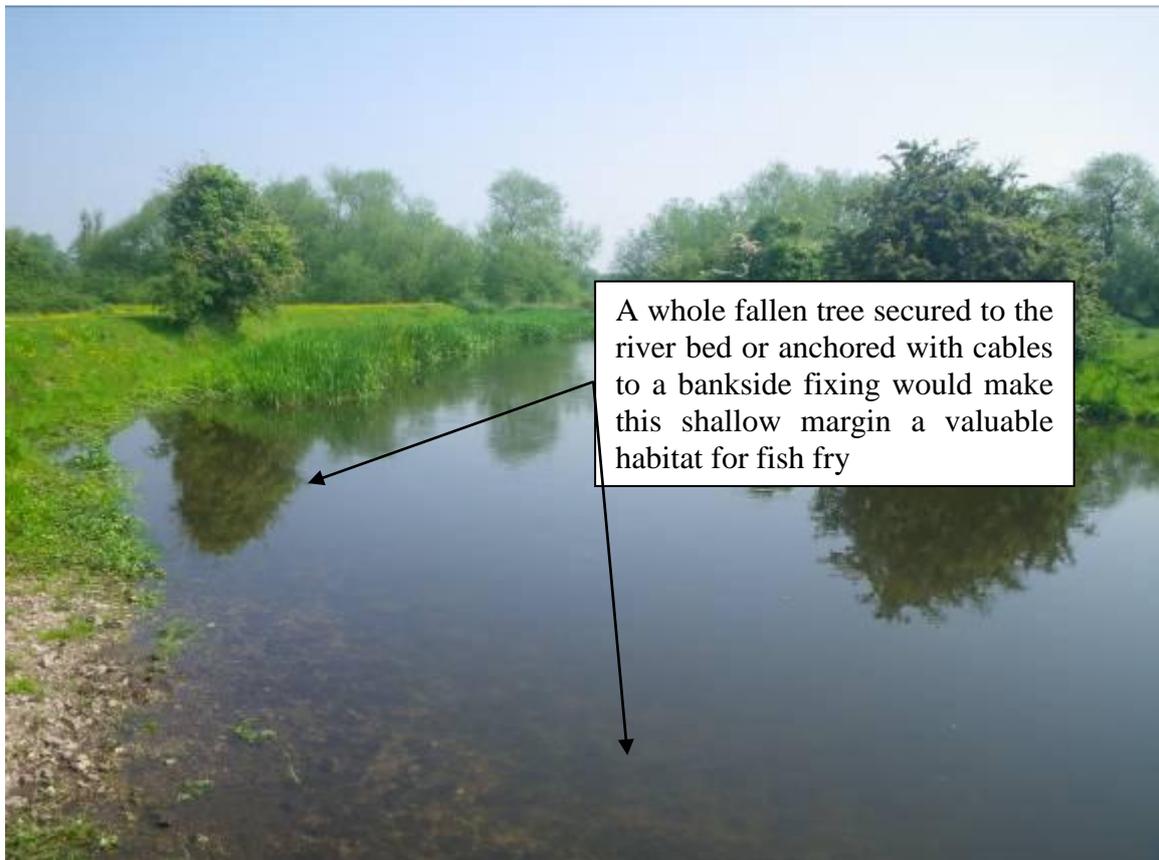


Photo 13. A long shallow bay in need of structure and cover

Towards the lower half of the Moor the channel has partially recovered from the past dredging activities and some luxurious beds of marginal emergent plants are well established (photo 14). These provide superb bank protection, habitat and help to elevate mid-channel water velocities by narrowing the channel. Access to the channel for pond dipping or angling is difficult but can easily be overcome by installing some low board-walks to access platforms. An example of a small "adhoc" structure installed by an angler is visible in photo 15. These structures should not damage habitat and this is a simple method for providing some riverside access. Platforms built for anglers do not need to be large, numerous in extent, or extend beyond the line of emergent plants but they are necessary if the water is to be made available for an angling club to rent.



Photo 14. Beds of marginal emergent plants squeezing the channel on the lower section. Good habitat for adult coarse fish.



Photo 15. View to the bottom boundary

It was not possible to fully inspect the river channel beyond the bottom boundary of the Moor. It is believed that the flat, impounded characteristics found within the channel on lower section of the Moor are the result of a large weir structure located on the Colne in Staines. It is possible that the A30 road bridge also backs the water up through the reserve, possibly due to a raised

bridge invert although this has not been confirmed with any visual inspection. To ensure that water is pulled through at an acceptable rate, it is advisable to monitor the rate of reed encroachment in the lower sections from the pipe services crossing down to the road bridge. Keeping this section a little wider than the reach above will help to maintain better quality in-channel habitat on the sections running through the Moor.

5. Conclusions

The river channels running through the Staines Moor Reserve offer significant opportunities for fishery habitat development. The site has very limited scope for salmonid fish species due to the lack of gradient and unpredictable water quality associated with local urban run-off.

The river Colne and Wraysbury river already support some good habitat for coarse fish, although this is somewhat limited in extent. It is obviously of critical importance that any measures taken to improve in-channel habitat do not compromise the protected status of the Staines Moor SSSI. There are measures that can be taken that will undoubtedly enhance in-channel habitat for a wide range of fish, plant and invertebrate species. The priority actions required are as follows:

5.1 Wraysbury River

A programme of sensitive tree works to establish a dappled light and shade regime. Woody material won from tree works should be secured into the channel to promote river bed scour and to provide additional cover.

There are some locations where potentially recharging the river bed with imported angular river gravels (10-50mm) could boost spawning opportunities for some fish species. A great site to enhance spawning opportunities would be adjacent to, and just upstream of the footbridge above the ford. Advice and support on how this might be carried out is available from the WTT.

The flow gauging weir is preventing free access for certain fish species and sizes. Ideally the weir should be replaced by the EA with a modern gauging weir that does not require the impoundment. If this is deemed a low priority for the EA then retro fitting a low cost baffle fish pass, including eel bristle mats to the crump weir face is possible. Recent EA R&D research on fish passage through gauging weirs and a stated policy by the EA should eventually lead to some much needed changes at sites like this. Local interest in effecting improvements will help.

5.2 Bonehead Ditch

A huge amount of resource could be put into improving habitat on the Bonehead Ditch. It is recommended that before any work is planned that an assessment of the flow requirements are made. There is a strong argument that the Bonehead Ditch should be managed purely as a ditch and possibly a blind ditch with a series of bunds to maintain water levels, rather than a flowing water course. Flow that is diverted via this route could be valuable in maintaining better quality habitat in the main River Colne. As a series of linear ditches, with

minimal flow, the system will still be valuable for a range of plant and invertebrate species as well as potentially being even more valuable for amphibians.

5.3 Main Colne Channel

Water level, flow splits and the connections to riparian habitat need to be fully understood before making any radical changes to the site. The previously dredged channel, flow control structure and the impact the bunds have on the frequency of meadow flooding and water retention need to be explored. For wading birds one would assume that a more frequent inundation is more valuable and perhaps slots could be cut into the bunds to facilitate wetting of the Moor and if necessary control structures fitted to regulate the rate of drainage. In-channel habitat generally responds well to reconnecting flood plains with minimal use of control structures and more emphasis on mimicking natural functioning systems.

The river channel running through the centre of the Staines Moor is a rather unusual habitat, currently not meeting its full potential for fish. The extensive shallow bays found on the sections in the middle to upper reaches of the reserve are potentially extremely valuable for coarse fish fry. Shallow, low flow bays are rare on many of our lowland rivers and maintaining this type of habitat will bring benefits to the lower Colne and possibly even the main River Thames.

To maximise the benefits associated with the wide shallow margins it is recommended that consideration is given to introducing much more large and coarse woody debris. This can either be pegged to the river bed, or tethered to firm fixings (driven posts) in the margins, so that they can freely lift and swing around during spate conditions. Some might suggest that this habitat looks messy and it will collect rubbish but the benefits derived for the Colne will far out-weigh any problems.

Given that some sections of wide shallow water is valuable, an important aspect to ensure that the shallows are packed with juvenile fish is to maximise opportunities for spawning at the upper end of the main channel. Currently there are good opportunities for root and weed spawning species but some light maintenance of the willows adjacent to the LB is required to maintain some weed growth.

Another consideration for maximising spawning opportunities is the availability of clean river bed gravels. The sections of channel either side of the island may well provide opportunities for gravel spawning fish species but ensuring that not too much flow is lost to the Bonehead Ditch is also a factor in making sure the upper reaches function as a spawning habitat. Recharging the squeezed sections of channel either side of the island with imported gravel could provide a superb spawning habitat for fish such as dace, chub, barbel and perhaps trout.

6. Recommendations

- If not already available then explore opportunities for a water level management plan with Natural England. Most SSSI sites in the UK that are dependent on water related habitat have been subject to a Water Level Management Plan.
- Tree management is required on the Wraysbury River and the upper section of the main Colne. Do not waste the opportunity for securing large quantities of LWD and CWD to peg into the channels to create improved cover and a more varied river bed topography.
- A temporary repair might be required adjacent to the leaking structure feeding water into the Bonehead Ditch. A long term plan for resource allocation is needed for this site and will influence any permanent repairs to the structure.
- Explore options with the EA for improving access for fish and local habitat quality adjacent to the Gauging Weir.
- Explore options for introducing spawning gravels to key locations on the Wraysbury River and the main River Colne.
- Monitor the encroachment of marginal plants right at the bottom of the reach. Intervene if necessary to avoid backing the river up too much.
- Consider some tree planting on the open sections of main channel with low scrubby trees such as willow. These will peg back reed encroachment and provide cover for fish.
- Carefully monitor grazing pressures. The wide shallow sections are valuable but diversity in channel width is even more important and some intervention with temporary fencing might be required to protect some sections of bank.

It is a legal requirement that some works to the river may require written Environment Agency consent prior to undertaking those works, either in-channel or within 8 metres of the bank. Any modifications to hard defences will require a land drainage consent on any river designated as "main river". Advice can be obtained from the EA's Development Control Officer.

Acknowledgement

The WTT would like to thank the Environment Agency for supporting the advisory and practical visit programmes.

Disclaimer

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