



River Cherwell – Steeple Aston



An advisory visit carried out by the Wild Trout Trust – November 2011

1. Introduction

This report is the output of a Wild Trout Trust advisory visit undertaken on two sections of the River Cherwell near Steeple Aston in Oxfordshire. The advisory visit was undertaken at the request of Mr. Chris Neville and Mr. Peter Higgins who have formed the Steeple Aston Fishing Club and lease the fishing rights from a local landowner.

The Cherwell has historically supported a good quality coarse fishery but is not widely regarded as a trout (*Salmo trutta*) fishery. This is thought to be mainly due to the natural geological characteristics of the river, being a comparatively turbid lowland river more suited to coarse fish populations and coarse angling tactics, rather than a fly fishery, where clearer water usually provides better quality sport. Occasional wild trout are found on main river locations, which are largely thought to drop out of one or two tributaries which are known to sustain natural trout production.

It is understood that the potential for developing a wild trout fishery here is extremely limited; however, Mr. Neville and Mr. Higgins would like to explore options for improving habitat so that the fishery can sustain a viable stocked trout fishery. By improving habitat it is hoped that the section might also support some wild fish, which are known to inhabit some of the Cherwell tributaries.

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

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.

2. Catchment overview

The Cherwell rises from iron-rich hills at Hellidon in Northamptonshire and flows south for approximately 50km to join the Thames at Oxford. The river runs through a predominantly clay catchment in a mostly modified channel. The large conurbation of Banbury has, certainly in the past at least, impacted on water quality. The slightly turbid nature of water within the Cherwell is thought to be associated with the local geology and iron rich source water; however, clarity has in the past also been impacted by trade effluents legally discharging from industrial sites in Banbury. It is understood that some of these long running issues have recently been addressed.

It is not known if the close proximity of the Oxford canal, which runs parallel with the Cherwell from Cropredy down to Thrupp, also impacts on water quality. It is likely that there is a regular exchange of water at various locations, which may impact on water quantity and water quality (clarity) within the Cherwell itself.

Long reaches of the Cherwell have been heavily dredged for land drainage and flood defence purposes. This has had serious consequences for the quality of in-channel habitat for flow loving species, mainly through the loss of shallow, fast sections running over a gravel substrate.

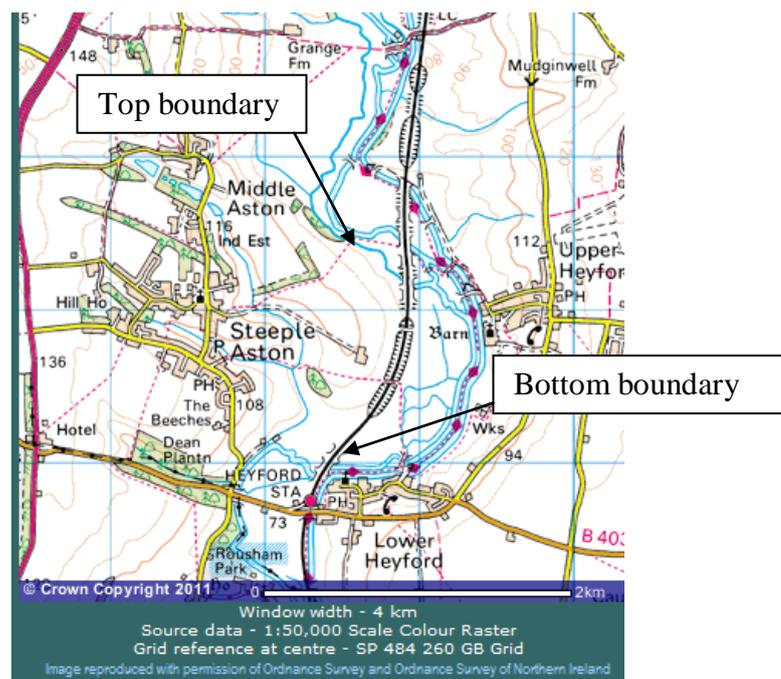
Under the Water Framework Directive (WFD) legislation, the Cherwell has been listed as a river failing its water quality objectives due to elevated phosphorous levels. Despite this failure the Environment Agency's assessment for fish suggests that the river is in "moderate" condition but that the data collected to support the assessment is "uncertain". The river will have been evaluated on the basis that it is a fishery likely to support a cyprinid (coarse fish) population rather than a salmonid fishery, where water quality standards have to be much higher.

The WFD legislation tasks member states to restore rivers to "Good Ecological Condition", the first milestone target being set for 2015.

3. Fishery overview

The Steeple Aston Fishing Club water is split into several sections. The bottom beat boundary is located at NGR SP 484 249 just north of Lower Heyford and extends to approximately 500m of RB. Above this there is a short section associated with a private mill, then a further 1km or so of river above the mill running parallel to the canal. Above this reach there is a further section extending to approximately 500m of channel either side of a railway bridge up to the top boundary at SP485 264..

The river is known to support a coarse fish population but the fishing club has only just secured the rights and there is no knowledge of how the fishery has previously performed.



4. Habitat assessment.

4.1 Bottom beat

Habitat quality and quantity for brown trout throughout most of the bottom beat is poor, even for adult stocked trout. The channel is wide and deep in places for the average discharge and very uniform in terms of flow variation. The exception to this is the first 100m or so of channel, which does have some potential to comfortably support trout. Here the channel width is pinched and reasonably shallow, with the river flowing over a mixed gravel and silt bed substrate. Water velocities on the top of this section were brisk, promoted by a reasonable slope in the channel gradient. Plenty of in-channel cover was provided by thick beds of fennel pond weed (*Potamogeton pectinatus*).



Upper end of the bottom beat potentially provides spawning opportunities for flow loving fish species including brown trout

Further downstream the channel becomes progressively wider and deeper. The submerged beds of fennel pond weed slowly give way to a channel dominated by emergent plants such as branched burr reed (*Sparganium erectum*) and common club rush (*Schoenoplectus lacustris*).

Plenty of marginal cover is provided by numerous low overhanging trees, including willow, thorn and field maple. In several locations fallen and severely leaning trees have dropped into the channel. This is providing some good quality habitat for a range of fish species and will be providing some excellent protection from predatory, fish-eating birds. Where the channel is pinched between fallen woody debris, adult trout could lie up, taking advantage of the local cover and elevated flows promoted by the naturally fallen woody material.



Under normal, or high flow conditions trout may well find the area adjacent to the fallen willow an attractive place to lie.

Moving downstream towards the bottom boundary the river becomes progressively more sluggish and heavily shaded by a canopy of mature crack willow. It is thought that the railway bridge near the bottom boundary may also contribute towards the sluggish nature of the channel by impounding water levels through this reach.

4.2 Middle beat.

The middle section of river lies above the mill in Lower Hayford and extends for approximately 1km, parallel with the Oxford Canal. This section of river is very heavily influenced by the milling impoundment and was largely devoid of any visible channel characteristics associated with variations in flow or bed topography. Typically the channel flows were sluggish, running between a very heavily wooded LB (canal bank) and an extremely open and heavily grazed meadow on the RB. Some good low overhanging cover was available for fish but the habitat quality of the river here is badly degraded through past dredging and heavy grazing pressures.



A section of the middle beat where the banks have been severely damaged through cattle trampling. The low shallows on the LB provide good quality habitat for adult fish species. Some light trimming to peg back the channel shading would be required to maintain the balance between fishable water and holding spots for fish.



In some locations beds of club rush have pinched the channel width promoting slightly elevated water velocities

In several locations the channel has been squeezed by encroaching beds of club rush. Where the rush grows in the river margins it can help to locally pinch the channel and create some improvement in the quality of habitat for flow loving fish species such as trout. Club rush can, however, also grow in the centre of the channel and have a negative impact by 'backing up' the river and locally slowing water velocities upstream. Managing this plant is difficult but is the key to improving in-channel habit through long sections of the Cherwell.



Another section of badly damaged river margin. The lack of any overhead cover and sluggish flow would make this a very unattractive and potentially hostile environment for trout.

4.2 Top beat

The very top beat, running for several hundred metres either side of the railway bridge, has by far the most potential for supporting trout. The channel here is much more conducive for flow loving fish species and has regained some of its gradient, much of which further downstream is drowned out by the milling impoundment in Lower Heyford. The channel width here is narrower than below and the river (in places) has a much more natural form, with some gentle bends and natural fluctuations in bed topography. Where the channel depth is reduced, beds of fennel pondweed are again evident. Although this plant is not a classic trout stream plant, it does provide attractive cover, where fish may hold comfortably to intercept food items drifting by. The plant also promotes some upwelling within the channel which is attractive to trout because it breaks up the smooth surface glide and potentially provides a safer place to hold station.

Some good quality low scrubby cover was also evident in this section.



A typical section of the top beat. This is habitat capable of holding flow loving fish species.



Straight section downstream of the railway bridge could be improved and should hold fish well.

A key component of wild trout habitat is river bed gravels. Some glimpses of bed gravel were seen on this top section and it may well be that significant seams of gravel are present but were not obvious during the visual inspection. However, there did not appear to be sufficient quantities of shallow gravel glide and riffle to sustain wild trout spawning. Introducing gravels and creating a spawning environment near the top of the fishery is entirely feasible, but to make any natural production viable there also needs to be significant quantities of very shallow, well covered juvenile trout habitat available in close proximity to spawning sites.

Creating this type of habitat in perhaps the top 100m or so of channel could be achieved but there would be no guarantee of successful trout recruitment. Introducing gravels locally, raising the bed and generally introducing more variation to the channel shape would make it a much more viable fishery. Flow loving fish such as chub, dace and barbel would benefit and it could make the section more attractive for stocked trout to reside as well as for members to fish. If there are viable wild populations residing in the nearby upstream tributaries then there may also be the opportunity to intercept and hold any wild fish that migrate out of the small tributaries, heading downstream looking for good holding water.

5. Overall assessment

The middle and lower sections of the Cherwell at Steeple Aston have very limited potential for wild trout production and only modest prospects for development into a stocked trout fishery. The very top end of the bottom beat may support a handful of stocked fish but the whole lower reach is more conducive to coarse fish such as roach and bream. Some improvements could be made through imaginative tree works and the creation of substantial flow deflectors. The opportunity for improvement is limited because the bottom section is impounded by the railway bridge and the long middle section is impounded by the milling structure. Water velocities throughout this middle and lower reach will always be sluggish and even stocked trout would struggle during low flow and warm weather conditions.

In contrast the very top section has considerable potential for development into a viable trout fishery. Some reasonable in-channel habitat already exists and could be improved to provide 500m of fishery that could sustain some low key occasional angling activity. Some wild fish may be present in this reach but to provide viable sport, some trout stocking will be required. This is discussed in the section below.

The priority for the top beat is to avoid any serious bank damage that is prevalent on many of the lower sections. The best solution is to negotiate with the farmer for permission to install some stock fencing. Access for cattle drinking isn't an issue below the railway bridge but in the meadow above the bridge, some access for stock drinking will have to be provided. Purpose built cattle drinks can be constructed by battering back the margin, lining the bay and slope with gravels and installing barriers to stop the cattle crossing, or roaming up and downstream. These drinking bays may also have an additional benefit in being good habitat for juvenile barbell, chub and dace. An alternative is to install a pasture pump which can be extremely effective, especially for beef cattle.

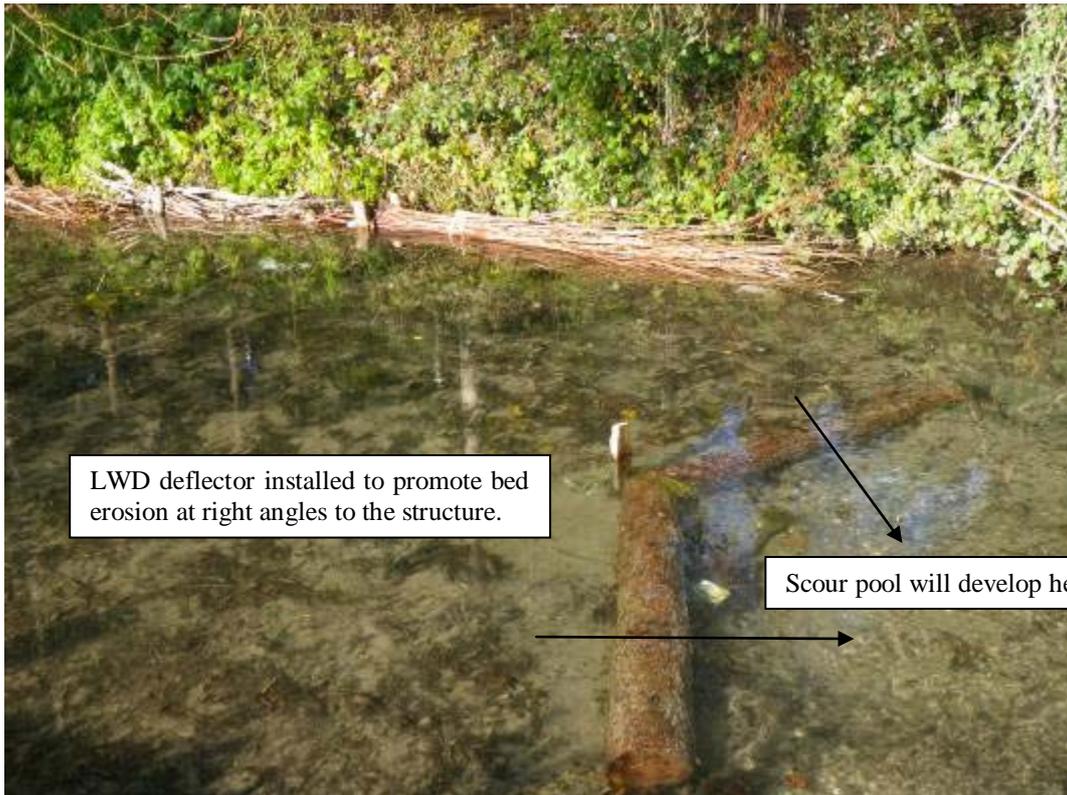


Pasture pumps can be set up behind a fence line. The cattle simply self pump water up from the channel via a pipe.

When considering the installation of stock fencing you should be aware that the areas within the fenced boundary will require maintenance to avoid the whole reach scrubbing up. One option is to negotiate a wide fenced buffer with access gates for stock so that some low level grazing can be facilitated within the fenced zone. The damage caused to river banks results from too many large beasts congregating in one area. Some light occasional grazing is beneficial.

The introduction of more low, overhanging tree cover is required. The simple solution is to cut small stakes or "whips" from a local willow (*Salix caprea*) and push them into the bank at a 45 degree angle just above the normal water level. This will encourage a low bushy roof to develop and create an ideal lie.

Further improvements can be made by importing and pegging in some large woody debris flow deflectors. Care must be taken when installing flow deflectors to ensure that the erosive forces are encouraged to erode the river bed and not the banks. Marginal deflectors must therefore be properly keyed into the bank and configured to kick the flow towards the centre of the channel. Although counterintuitive, the deflectors need to be pointing slightly upstream. Examples of where and how to install woody debris flow deflectors can be found in the WTT Chalkstream Habitat Manual, available either as a CD from our office, or as a pdf download via our website www.wildtrout.org



A newly installed flow deflector in the Bucks Wye. Note the brush bundles pegged into the margins to provide improved cover for juvenile fish



Sallows providing superb cover on a section of the Test. Planting them couldn't be easier.

Another option to consider is restoring the channel by importing gravels to raise the bed. This work is comparatively simple and very effective but obviously not cheap. I would suggest that this option is given some serious thought. Support may be available via project grants from the Environment Agency, particularly if improving the channel here is part of an overall package to achieve Water Framework Directive targets. To give you some idea of potential costs, a 15 to 20m long gravel ramp/riffle would cost in the region of £4k to install. The top section could support three or four areas where new spawning and juvenile habitat could be created.

6. Trout stocking

I would suggest an early consultation with the local Environment Agency before committing any resources to this section of river. It is unlikely that the Steeple Aston reach will provide any viable trout fishing without the need for regular stocking. Fish stocking in rivers and stillwaters is regulated under Section 30 of the Salmon and Freshwater Fisheries Act 1975 and a written consent is required from the EA before fish can be introduced. Where fisheries have a long history and tradition of trout stocking this generally isn't an issue. However, the Cherwell may not be regarded by the EA as a priority trout fishery and they will need to evaluate the environmental risks of a new trout fishery being developed, including the impact on existing fish stocks.

The EA, as part of their National Trout and Grayling Fishery Strategy, have reviewed the regulations regarding trout stocking and from 2015 all trout stocked into rivers will have to be sterile all female fish (triploid). If stocking is acceptable on the Cherwell then it is highly likely the EA will insist that any introductions are with sterile stock.

This policy is designed to protect wild fish stocks from the known adverse effects of genetic introgression (domestication within the wild stock). Although there may be a desire to stock with fertile fish in the hope of establishing a local natural production, practical experience shows that farmed fish are generally not fit enough to establish a wild population. Better results are achieved by a programme of habitat enhancement to ensure that any available wild fish will be encouraged to take up residence and spawn.

If the EA is willing to permit stocking on this section of the Cherwell then it is recommended to concentrate stocking on the very top 500m of fishing. Fish should not be stocked before the season starts in April and should be well spread throughout the fishable water. Stocking frequency will depend on site fidelity and angling pressure. In order to maximise the chances of fish taking up residence and reducing the number lost from the fishery, stock densities should be limited to no more than 2 adult trout per 100m². I would estimate that an initial stocking of a maximum of 50 adult trout spread throughout the top beat would provide some sport. The fish should be of an appropriate size for the river and individuals should be no larger than 750 grams and ideally average around 450 grams. The stock can then be replenished in the summer if required with an additional stocking subject to angling pressure. It is highly unlikely that stocked trout will overwinter in this reach of the Cherwell and it is recommended to run the stock down via catch and kill tactics during September.

A programme of habitat improvements to provide additional cover and variations in stream depth and flow patterns may encourage a greater proportion of your stocked fish to take up residence. Any temptation to increase stock densities without a corresponding improvement in habitat quality and availability will simply result in stocked fish vacating the reach.

7. Conclusions

Attempting to create a viable trout fishery on the middle and lower sections is not recommended. If the EA is prepared to grant consent for trout stocking then try trickling in a few fish near to the top of the very bottom beat. However suitable habitat, even for stocked fish is very limited and any stocking here should be viewed as a "suck it and see" option.

Concentrate efforts on the very top 500m of the top beat. An early consultation with the local EA Fisheries Officer is strongly recommended to discuss trout stocking options. This reach will support low numbers of introduced trout, even without additional work. Protecting the banks from excessive cattle poaching and introducing more cover (through tree planting) as well as promoting more topographical variety (LWD flow deflectors) within the channel will enhance the potential of the fishery. Introducing gravels to provide spawning and nursery habitat for flow loving fish should also be considered if the initial experience of running a fishery here proves successful.

8. Recommendations

- Concentrate all efforts in developing the top end of the fishery.
- Discuss options for trout stocking with the local EA Fisheries Officer.
- Initially stock with a maximum of 50 trout trickled throughout the top 500m of channel, if the EA agree to this option.
- Provide more overhead low scrubby cover by planting willows.
- Protect vulnerable banks from damage by negotiating some stock fencing with the farmer.
- Create a more interesting and variable bed topography by introducing LWD flow deflectors.

It is a legal requirement that some works to the river may require written Environment Agency consent prior to undertaking any 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.

7. Making it happen

There is the possibility that the WTT could help to start an enhancement project. We could potentially help to draw up a project proposal (PP) which could be used to support any application for Land Drainage Consent. The PP might also be used as a document to be shared with potential partners as a vehicle for raising project funding.

Alternatively, physical enhancement works could be kick-started with the assistance of a WTT 'Practical Visit' (PV). This approach is probably more appropriate for works to the side carriers. PV's typically comprise a 1-3 day visit where approved WTT 'Wet-Work' experts will complete a demonstration plot on the site to be restored. This will enable project leaders and teams to obtain on the ground training regarding the appropriate use of conservation techniques and materials, including Health & Safety, equipment and requirements. This will then give projects the strongest possible start leading to successful completion of aims and objectives.

Recipients will be expected to cover travel and accommodation expenses of the contractor.

There is currently a big demand for practical assistance and the WTT has to prioritise exactly where it can deploy its limited resources. The Trust is always available to provide free advice and help to clubs, syndicates and landowners through guidance and linking them up with others that have had experience in improving trout fisheries.

Acknowledgement

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

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