



River Leach – Cotswold Fly Fishers



A Project Proposal by the Wild Trout Trust - April 2015

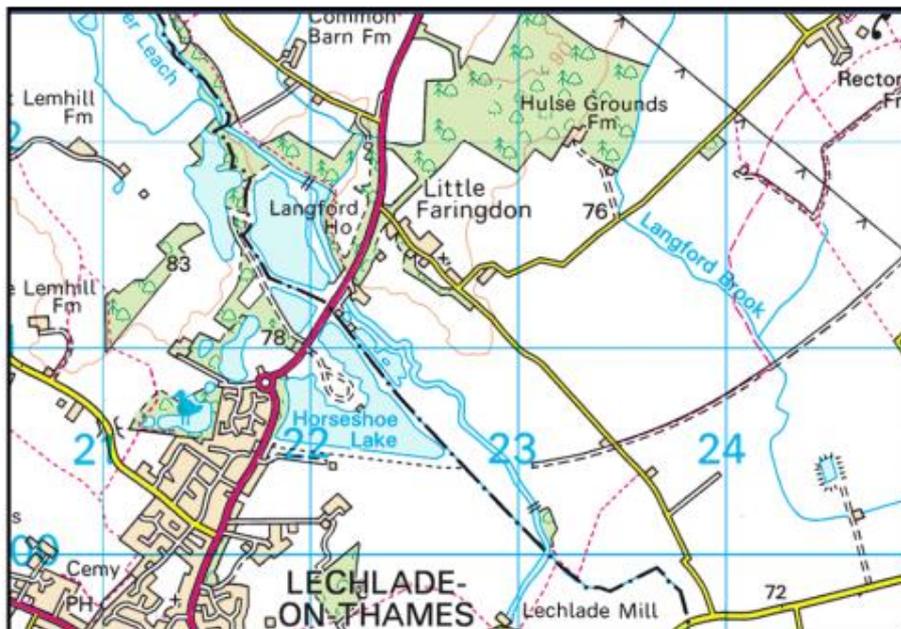
1. Introduction

This report is the output of a site visit to the River Leach on water controlled by the Cotswold Fly Fishers (CFF). The CFF water runs from a short distance downstream of the village of Southrop to just upstream of Lechlade Mill. The water is split into two beats running either side of the A361 at Little Faringdon, with a short gap in the middle where the river runs through the Lechlade Trout Fishery and fish farm. Approximately 3km of channel was inspected in all, from a point at National Grid Ref SP 208 031 down to SU 230998.

The Leach is classified as being of "moderate status" under the Water Framework Directive. Waterbody ID no. GB106039030040.

The visit was initially requested by Jim Seymour, Fisheries Technical Officer with the Environment Agency. The Environment Agency, in partnership with the CFF and the Cotswold Rivers Trust (CRT) are seeking to identify reaches of river where habitat quality might be restricting rivers from meeting their full potential, and where there might be scope for enhancement. In recent years, wild brown trout *Salmo trutta* numbers appear to have dropped and all parties are keen to explore options to support and improve local fish populations.

Comments in this report are based on observations on the day of the site visit and discussions with Mr. David Reinger (CFF) and Mr. Trevor Cramphorn (CFF and CRT). 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.



Map 1 River Leach at Little Faringdon ©streetmap.

2. Catchment overview

The Leach rises from the Cotswold limestone aquifer near the village of Hampnett and flows for approximately 30 km to join the Thames at Lechade. The upper reaches drain a mainly agricultural landscape and the river channel itself has ephemeral winterbourne characteristics with guaranteed perennial flow occurring downstream of the village of Eastleach Martin.

The Leach, along with the River Dickler, is widely regarded as one of the best wild brown trout fisheries in the Cotswolds. Water quality is generally considered to be good. The river is, however, impacted by a number of water level control structures, including one located at the fish farm site, which diverts a significant proportion of the flow through the farm.

3. Habitat assessment

3.1 Leach downstream of fish farm.

The section of river running downstream from the fish farm supports a range of high quality habitats, suitable for all brown trout life stages. The river has a meandering planform and supports a classic sequence of pools, glides and riffles. Although in-channel weed cover is somewhat limited, the amount of low, rough-covered margins provide excellent cover for both juveniles on shallow runs and adults in attractive, secure pool environments.

The extent of the habitat available for trout is no accident and is a testament to the commitment and hard work put in by the CFF management committee. Numerous examples of habitat improvement works carried out by the club were noted, including the installation of large woody debris (LWD) flow deflectors (photo 1) and consolidation of fallen woody material to provide improved in-channel habitat (photo 2).

The delicate balance of providing optimum holding habitat for trout and maintaining access for angling has been well planned and executed. A good example of this is the tree work, where an optimal ratio of dappled light and shade has been maintained. Trees that are in danger of falling have been topped, but long sections of trunk retained to promote valuable river bed scour (photo 3).



Photo 1. A hinged and secured LWD flow deflector installed by the CFF.



Photo 2. A good example of retained natural woody material squeezing the channel width and promoting varied flow pattern as well as scour and deposition.



Photo 3. A half fallen tree skillfully topped. An ideal method for creating pool habitat and great lying up opportunities for adult trout.

An initial inspection of the river bed suggests that opportunities for spawning should be extensive, with numerous ramps of gravel clearly evident; however, despite what looked to be good spawning environments, few redds were observed. Those that were seen were poorly defined and covered in fine sediments (photo 4).

The natural gravel substrate observed appeared to be quite small in nature, with the majority of the bed gravels less than 20mm in diameter. Huge quantities of very fine bed material, almost constituting coarse sand was evident (photo5). Observation of the substrate located immediately below the woody debris suggest that the bed is highly mobile.

A common issue associated chalk and limestone rivers is the propensity for calcium carbonate precipitation (tufa) to occur which can cause gravels to become encrusted and naturally lock together, particularly on shallow gravel glides. The result is a flat, concreted bed which severely limits spawning opportunities. Interestingly, this does not appear to be the case on the Leach, with the varied bed topography clearly indicating a river bed that responds to bed scouring which changes the physical shape of the channel. The calcium carbonate precipitate is, however, still present, but rather than concreting the bed materials together, it forms individually around fine particles to form coarse beads of tufa known as oncoids.

It is possible for trout to excavate redds into this bed material but the passage for the free flow of oxygen rich water through such bed material is likely to be compromised. This is potentially a bottleneck for the population and an area for

further research to find the right management options for creating optimum spawning conditions.



Photo 4 Two redds located on this potentially favorable spawning site.



Photo 5. Shallow glide habitat flowing over a fine bed sediments. Highly unlikely to be suitable for spawning and not enough cover to warrant good juvenile habitat. Areas like this are ripe for enhancement.

A low structure (photo 6) is present halfway down the reach. The head loss at this small weir is modest and the structure as inspected does not restrict access for fish on spawning migrations. Adjacent to the weir was a large stop log (photo 7) which has been used to impound the upstream levels at some stage. Interestingly, the river bed has re-graded upstream of the structure, indicating that it has been present for a considerable time and providing further evidence of the mobile nature of the river bed materials.

A short distance upstream of the structure the river embarks on a series of extravagant meander bends (photo 8). Some bank erosion was evident in this section, which the club have attempted to address (photo 9) but which will require further attention if the meander is to be retained. It is possible that the bank erosion issue has been exacerbated by the insertion and then removal of the large stop log. Bank instability is often caused by temporarily raising upstream water levels and then lowering the impoundment, which draws the water through at a faster rate adjacent to the waterlogged bank areas, which are left undefended by any established vegetation and thus causing bank toe failure and slumping. Keeping the timber stop log out permanently, packing the eroded bank toe with brushwood or live willow will improve bank stability through the meandering section.



Photo 6. The low weir is passable for adult trout but has been responsible for a significant rise in upstream bed levels.



Photo 7. A large stop log which has been used to try and hold up water levels



Photo 8. A big meander bend a short distance upstream of the weir



Photo 9. The outside of the bend eroding, possibly in response to the removal of the stop log downstream.

In general, areas of good quality holding habitat for adult trout were available throughout the reach. In a few locations, occasional coppicing of mature alder stands (photo 10) to provide diversity within the age structure and to allow pockets of light to hit the river bed would be beneficial.

Some examples of in-channel submerged weed (mainly fennel pond weed -photo 11) were seen. Some excellent examples of low, soft margins, well defended with thick stands of reed canary grass and sedge provide great bank protection as well as marginal cover and critically important habitat for invertebrates (photo 12 and 13).



Photo 10. A line of mature alders on the far LB would benefit from the odd clump being coppiced and the near RB could usefully support the odd low, overhanging tree such as a willow, thorn or elder.



Photo 11. Submerged weed bed providing critically important early spring cover.



Photo 12. Low, wet berm. Great habitat for fly life.



Photo 13. A thick sedge fringe providing a stable and biologically rich margin.

3.2 Leach Upstream of Fish Farm

Upstream of the fish farm a wide range of good quality trout habitat is supported. The river provides more varied habitat than the downstream beat, including a series of spectacular meander bends (photo 14). Care must be taken to ensure that the vulnerable narrow sections are not prone to erosion pressures by encouraging luxuriant marginal vegetation. This can be achieved through a combination of sensitive tree management, to promote more light, and packing the margins with plenty of brushwood.



Photo 14. An extravagant meander, one of a series near the upstream limit of the beat. More light, less footfall and plenty of brushwood in the upstream narrow margin is required to prevent the river from cutting through.

The one exception to the excellent and varied habitat found on the upper beat is the reach located near the downstream end, approximately 100m below the access track; here, a significant section of the river channel is too wide and heavily shaded. As a result, the morphology of the channel is too uniform to provide any opportunities for the river to promote good quality trout habitat (photo 15). Of all the sections inspected, this is the reach that has the greatest potential for enhancement via simple tree work and the use of woody materials secured into the channel to promote bed scour and provide much need cover.



Photo 15. Lower section of the upstream beat is ripe for enhancement.

4. Habitat improvement options

Redoubling efforts to ensure that spawning gravels are well sorted and relatively free of fine sediment could help to promote significant improvements in egg-to-fry survival. This work should be coupled with actions to ensure that adjacent shallow water habitat is packed with complex cover such as coarse woody debris, trailing marginal plants and submerged weed. Providing more cover in very shallow water immediately adjacent to and just downstream of optimal spawning sites will help to boost survival of fry and parr.

More research is required on Cotswold rivers to evaluate the various techniques commonly used in improving spawning habitat quality to help shape future management and maintenance options for the Leach.

The large timber stop log that has been used at the weir location should not be re-installed. Measures to defend the vulnerable banks on the outside of meander bends should be taken to avoid future bank failure.

Dappled light and shade is critically important for most trout streams and currently the Leach is dominated by high level shading from mainly mature alder trees. Coppicing within blocks of trees will provide some respite from high level shade but a rolling programme is needed to avoid over-shading in the future. Some increased low water-level shading would be useful, particularly over pool habitat. Sallows and thorns are particularly valuable in providing this type of low cover without casting a shadow over the whole channel.

It is recommended to concentrate efforts on improving the wide, shaded section on the lower reaches of the upstream beat. To this end, a range of actions is required including:

- Coppicing within blocks of marginal trees on the RB to promote more light penetration.
- Use the woody materials won for flow deflectors to promote bed scour and variation in bed topography.
- Secure whole tree kickers to provide valuable marginal cover and natural channel narrowing.
- Peg in coarse woody brushwood berms or shelves to provide complex cover for small fish and food and habitat for invertebrates as well as promoting flow diversity

A good start to this work could be achieved via a WTT River Habitat Workshop day where WTT staff, together with representatives from the CFF and CRT, could get together to demonstrate the full range of techniques that can be deployed.

Funding for this event is already available. All that is needed is to discuss the scope of the work with Jim Seymour and prepare a Flood Defence Consent application.

It is recommended to set aside a day or two in October to carry out the work. Allowing for a two-month deliberation period, application for consent must be submitted before the end of August to ensure the consent can be secured prior to October.

5. Project actions

- WTT to circulate this Project Proposal and CFF and CRT to feedback comments. Final draft to be forwarded to Jim Seymour from the EA prior to FDC application.
- WTT to prepare an application for FDC, to include method statement and risk assessment.
- CFF and CRT to identify suitable dates for workshop and secure landowner permissions if necessary.
- CFF and CRT to discuss the possibility of opening up the event as a wider training day form non CFF participants.

Other actions.

Undertake a literature review of any research already undertaken looking into gravel quality and spawning success on Cotswold Limestone rivers.

Acknowledgement

The WTT would like to thank the Environment Agency for supporting the advisory and practical visit programme in England, through a partnership funded using rod licence income.

Disclaimer

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