WILD TROUT TRUST

Advisory Visit

Cound Brook, Shropshire

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1.0 Introduction

This report is the output of a site visit undertaken by Tim Jacklin of the Wild Trout Trust to the Cound Brook at Eaton Mascott Estate, Shropshire, on 10th June 2020. Comments in this report are based on observations during the site visit and discussions with the landowner.

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.

2.0 Catchment / Fishery Overview

The section of the Cound Brook visited is located approximately 4km upstream of its confluence with the River Severn between Atcham and Cressage, south of Shrewsbury. A section of both the Cound Brook and its tributary the Row Brook were inspected upstream of their confluence.

The geology of the area is sedimentary bedrock (Salop Formation – mudstone and sandstone, formed approximately 272 to 310 million years ago in the Permian and Carboniferous Periods[1]), with superficial deposits of river alluvium and glacial till. Soils in the vicinity are sandy and easily eroded. Combined with potato and maize cultivation, this tends to lead to excessive levels of fine sediment reaching the watercourses.

In order to meet the requirements of the Water Framework Directive, the Environment Agency monitor the quality of watercourses using a number of measured parameters including plant, algae, invertebrate and fish populations, along with physical and chemical measures. These are given a rating on a scale of *high*, *good*, *moderate*, *poor* and *fail.* The lowest ranking parameter determines the overall ecological classification of the waterbody. In this case, both the Cound Brook and Row Brook are currently classified as *poor* ecological status overall (Table 1). The determining factor in both cases is a *poor* rating for algae and plants (phytobenthos and macrophytes), due to excessive levels of phosphate from diffuse pollution from agriculture.

[1] British Geological Survey https://mapapps.bgs.ac.uk/geologyofbritain/home.html

Invertebrates are rated as *high* on both brooks and fish as *good* on the Cound Brook (not measured on the Row Brook).

River	**Cound Brook**	**Row Brook**
Waterbody Name	Cound Brook - Condover Bridge to confluence with River Severn	Row Brook - source to confluence with Cound Brook
Waterbody ID	GB109054049510	GB109054049420
Management Catchment	Severn Uplands > Cound Brook	Severn Uplands > Cound Brook
River Basin District	Severn	Severn
Current Ecological Quality	Overall classification of **Poor** ecological status in 2016	Overall classification of **Poor** ecological status in 2016
U/S Grid Ref inspected	SJ5341405561	SJ5406305061
D/S Grid Ref inspected	SJ5435505208	SJ5435505208
Length of river inspected	~1200m	~400m

Table 1 Summary of Water Framework Directive information for the waterbodies within which the Eaton Mascott fishery is located (https://environment.data.gov.uk/catchment-planning/WaterBody/GB109054049510).

3.0 Habitat Assessment

Both brooks run through moderately steep-sided valleys and the channels are incised with exposed bedrock visible in many areas, particularly in the Row Brook. In the Cound Brook, coarse sediment (gravel) is more abundant but seems to occur in shallow deposits over the bedrock. The plan-form of the brooks is natural but relatively straight; combined with the scour-resistant bedrock, the lack of meanders limits the number of pools, but where they do occur they are deep and provide good adult trout habitat.

Photo 1 Exposed bedrock on the Row Brook.

Photo 2 A deep corner pool on the Row Brook. The combination of depth, low cover and an undercut bank provide good adult trout habitat.

The brooks are located within mainly deciduous woodland and this is beneficial in a number of ways:

- A wide zone of natural vegetation to buffer against detrimental inputs from more intensively managed land, such as fine sediment, nutrients and pesticides.
- Greater bank stability (tree roots), which promotes bed scour and increased depths rather than channel widening and shallowing.
- Shading to keep water temperatures down. This is particularly important in surface-fed rivers (cf groundwater fed) which can experience low flows and temperatures above the tolerance of trout (low twenties Celsius) in summer. Tree shading has been shown to be very important in moderating stream water temperatures.
- A supply of large woody material (LWM)(Photo 3). Fallen timber provides valuable in-stream habitat by influencing the flow dynamics and hence the shape of the river channel. It can promote the formation of pools, grade sediment (improving fish spawning and invertebrate habitat) and trap leaf litter (see below).
- A supply of leaf litter which increases stream productivity, being broken down by a range of bacteria, fungi and shredding invertebrates which support the food web and ultimately greater numbers of trout.

Photo 3 Large woody material accumulation – valuable habitat.

In one part of the brook an accumulation of large woody material has recently been removed from the channel with an excavator (Photo 4). In most circumstances, such removal is detrimental to the river habitat and the presumption should be to leave it in place. The guidelines here www.wildtrout.org/assets/files/library/Woody_Debris_Apr2012_WEB.pdf provide a helpful guide to decision making. It is useful to remember that the 'log-jams' are dynamic structures, forming and breaking down over varying timescales. In locations such as this, they rarely present an obstacle to fish movement and any increased bank erosion doesn't threaten valuable land or assets. In this context, the processes promoted by log-lams should be thought of as valuable and habitat-forming rather than detrimental.

If woody material really is causing a problem, a less disruptive intervention would be to make selective cuts with a chainsaw to cross-members within the log jam, then wait for higher flows to naturally move the material.

Photo 4 Site of large woody material removal

On the Cound Brook there are some excellent pools, with good cover adding to their fish-holding capacity (Photo 5 - Photo 7). Low cover is extremely important and can make the difference between presence or absence of fish in a river reach. It can be defined as material in the water or within about 30cm of the water surface. Higher level branches are less valuable in this respect and can be trimmed to aid casting and fishery access, but consideration should always be given to whether they could be utilised to improve low cover by hinging and laying (see recommendations).

Photo 5 A deep pool with good low cover provided at the neck of the pool by a slumped tree. The crease between differing current speeds on the outside edge of the tree is an ideal lie for a trout and one was observed rising there.

Photo 6 A small hazel tree has naturally folded along the far bank here adding good low cover to what would otherwise be an exposed pool. A larger tree was removed here (stump) to retain the roots within the bank. Arguably, allowing the tree to fall into the river and the outer bank to erode would have contributed to greater habitat diversity. However, retaining some of the cut branches and wedging them into the roots (arrow) could provide good fish-holding cover. Any re-growth from the coppiced stump could also be laid into the river margins for the same purpose (see recommendations).

Photo 7 A pool with an accumulation of woody material along the far bank providing very good cover and enhancing the fish-holding potential.

It was discussed whether trees leaning over the watercourse were best coppiced to prevent loss of the root mass from the bank, exposing it to increased rates of erosion. This needs to be assessed on a case-by-case basis. In some areas it may be best to allow the tree to fall, contributing LWM to the watercourse and allowing lateral scour to further develop pool habitat (for example, Photo 6). In other cases, coppicing a tree which does not have much potential for LWM could provide re-growth that is subsequently laid to improve low cover (Photo 8). In other cases, deliberately felling and fixing the tree would provide LWM and/or low cover as well as retaining the root mass within the bank (Photo 9 - Photo 10) (see recommendations).

Photo 8 A leaning 'leggy' sycamore that could usefully be coppiced and subsequent re-growth used to hinge and lay into the margins.

Photo 9 More branched leaning trees that could be hinged and laid (or cabled) into the margins to provide cover.

Photo 10 Smaller leaning trees (or coppice re-growth) ideal for laying into the margins.

On the right bank towards the upstream end of the reach, there were some drains leading from a track which were supplying fine sediment to the river (Photo 11). Fine sediment clogs spawning gravels, decreases trout egg survival and impacts upon invertebrates. Measures should be implemented to reduce fine sediment inputs like this, such as cross-drains on tracks leading to swales, silt traps or field margins rather than the watercourse (https://www.gov.uk/countryside-stewardship-grants/cross-drains-rp5).

Photo 11 Fine sediment input from a pipe draining a nearby farm track.

At the upstream end of the Cound Brook reach is a farm bridge and the site of a former concrete weir which supplied a hydraulic ram pump (Photo 12). In response to the weir breaking down, it was replaced first with gabion baskets which failed and more recently with boulders. The reason for repairing the weir is aesthetic rather than functional, as the ram pump is no longer used.

Photo 12 Former concrete weir replaced with boulders.

Weirs are detrimental to river habitats, interrupting fish migration and natural sediment transport, and raising upstream water levels which 'drowns' natural in-stream habitat (Figure 1). In the specific case here, there is little negative impact: the impoundment is small and does not extend a significant distance upstream; there is also no impediment to fish movement because of the open structure of the boulders. However, if there is no longer a need for the raised upstream water levels it would have been simpler and more beneficial simply to remove the old weir.

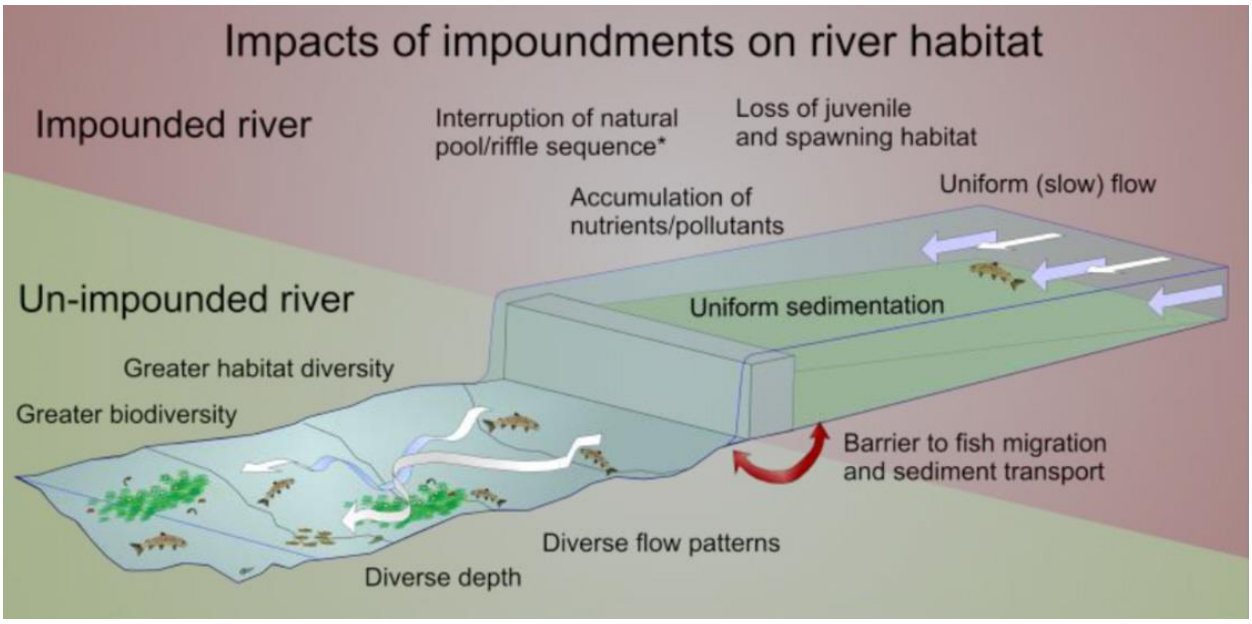

Figure 1

Boulders have also been placed just upstream of the farm bridge (Photo 13) a short distance downstream of the weir. Again, the impact on fish movement and habitat is minimal, but it could be a problem for the bridge in the future. Scour pools form downstream of weirs (due to the focus of flow energy and net loss of sediment). Here the scour pool will develop beneath the bridge adjacent to its footings, potentially undermining them. Removing the boulders would allow a more even distribution of sediment (gravel) protecting the footings.

Photo 13 Boulders placed upstream of the bridge. The effect of sediment accumulation upstream of weirs can be clearly seen here. High flows over the boulders may lead to scour underneath the bridge which could be problematic if it affects the footings.

Upstream of the weir, accelerated rates of bank erosion were evident on the right bank (Photo 14). This is occurring through 'block failure', where the toe of the bank is eroded by river flow and the block of earth above, usually when saturated, falls into the river. The lack of trees or other deep-rooted vegetation here (grazing right up to the river) means the bank is less resistant. Some techniques for slowing the rate of erosion are described in the recommendations.

Photo 14 Accelerated rates of bank erosion.

The invasive non-native plant species Himalayan balsam is present in low numbers and a small stand of Japanese knotweed was also seen. The former is an annual species that can be controlled by hand-pulling before it flowers in mid-summer. The latter is much more persistent and spreads through underground runners and also propagates from broken plant fragments; for this reason it is important not to flail or strim knotweed.

4.0 Recommendations

- Retain naturally occurring fallen woody material within the channel wherever possible.
- Retain low cover (in or close to the water surface) and create more by partially cutting and laying over suitable trees into the river in a similar manner to hedge laying (Photo 15). Larger trees can be treated in a similar

way, or if it is not possible to create a hinge, they can be cabled to their stump (Photo 16).

Photo 15 Even quite large trees can be hinged over into the water.

Photo 16 A larger tree felled and fixed to its stump with 8mm steel cable

- Leaning trees can either be allowed to fall into the river as large woody material or coppiced, depending upon their position (as discussed above). The re-growth from coppiced stumps can be laid over in the future (Photo 17).

Photo 17 Coppiced re-growth cut and laid to create good cover. Inset: example of steeply angled back-cut to create a hinge

- Address the fine sediment inputs from the track and elsewhere on the estate wherever possible to minimise the amount reaching the watercourse. The pathways for fine sediment reaching the river are often the same as those for nutrients such as phosphate (the reason for the *poor* ecological status of the watercourse noted in section 2.0), hence there is a double benefit from improvements.

Photo 18 A cross-drain (which requires clearing) on a track leading to an interceptor where silt can settle out.

- Consider removal of the boulders upstream of the farm bridge and possibly the also the weir.
- The bank erosion upstream of the weir could be tackled by protecting the toe of the bank with brushwood staked and wired in place. The bank could also be re-profiled back to shallower angle. A wide buffer zone should then be fenced off from livestock to allow vegetation to colonise and stabilise the bank.

Photo 19 A re-profiled bank protected with brushwood staked and wired in place.

Photo 20 A time series of photos over three years showing natural vegetation regeneration and increased bank stability following fencing out of livestock.

- Prevent the spread of Japanese knotweed from the stand observed. Do not use any method of cutting that could spread small fragments of the plant. Licensed herbicide application by a qualified operator is recommended. Guidance is available here: www.gov.uk/guidance/prevent-japanese-knotweed-from-spreading

Please note it is a legal requirement that works to the river require prior written consent from the Environment Agency (EA).

5.0 Making it Happen

Further assistance from the Wild Trout Trust is available in the form of:

- Helping obtain the necessary permits from the Environment Agency for carrying out in-stream works.
- A practical visit, which involves a visit from a WTT Conservation Officer to demonstrate the techniques described. This enables recipients to obtain on-the-ground training regarding the appropriate use of conservation techniques and materials, including Health & Safety, equipment. This will then give projects the strongest possible start leading to successful completion of aims and objectives. Recipients will be expected to cover travel expenses of the WTT attendees.

The WTT website library has a wide range of free materials in video and PDF format on habitat management and improvement:

www.wildtrout.org/content/library

The Wild Trout Trust has also 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.

6.0 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.

7.0 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.