Advisory Visit

River Leven

(Skutterskelfe Anglers)

26/11/2019

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Key findings

- The general quality habitat observed on the Skutterskelfe Anglers' water was good, with plenty of natural features capable of supporting wild brown trout. Some small habitat tweaks could be made, but overall, the habitat was as would be expected on an upland river, barring a few man-made issues.
- Several areas would benefit from buffer fencing to allow the development of more diverse and abundant riparian vegetation.
- Naturally occurring in-channel structure like fallen trees and other woody material should be retained in place as valuable habitat features.
- It would be well worth supporting other local organisations in any initiatives designed to protect water and habitat quality via sympathetic land use to reduce fine sediment input and other pollutants from entering the river. Similarly, supporting any initiatives to tackle non-native species would be in the interest of anglers.

1.0 Introduction

This report is the output of a visit to the River Leven, North Yorkshire, at the request of Skutterskelfe Anglers, undertaken on 26th November 2019. Three sections of the river were walked to provide an overview of the fishery and identify potential areas where improvements could be made. Normal convention is applied throughout this report with respect to bank identification, i.e. the banks are designated left bank (LB) or right bank (RB) whilst looking downstream. The Ordnance Survey National Grid Reference system is used to identify specific locations.

This is one of three advisory visits undertake to the River Leven in recent years. More detailed background on the river and information pertaining to the adjacent section (Hutton Rudby Angling Club's water) can be found in on the Wild Trout Trust website - www.wildtrout.org/assets/reports/Leven%20_2011.pdf

&

www.wildtrout.org/assets/reports/Hutton-Rudby-2019.pdf.

2.0 Background

Table 1. Overview of the waterbody details for the section visited

	Waterbody details
Waterbody ID	GB103025071880
River	Leven
Waterbody Name(s)	Leven from Tame to River Tees
River Basin District	Northumbria
Artificial or Heavily Modified	Heavily modified - so assessed against Ecological Potential.
Current Ecological Quality (2016)	**Moderate**: being 'Poor' for Fish (despite good angler catches) and Phosphate.
Grid Ref	NZ 47510 06178 - NZ 49515 06443
Length of river inspected (km)	2.5

(https://environment.data.gov.uk/catchment-planning/WaterBody/GB103025071880)

The conditions on the day of the visit were not ideal, owing to heavy rain in the preceding days that elevated the river level and increased turbidity. The poor clarity of the water limited the potential for assessment of the river substrate but did serve to highlight the problem of elevated fine sediment input on the catchment (an issue also identified in the previous report for Hutton Rudby AC that was undertaken when the river was lower and clearer).

3.0 Habitat Assessment

The first section inspected was towards the downstream end of the fishery, around Sexhow Hall Farm. In this area, the banks appear to be relatively stable, with no major erosion issues; however, the unfettered livestock access and grazing pressures creates a distinct paucity of bankside vegetation. Buffer fencing would allow the development of a diverse strip of vegetation, greatly improving the general habitat for invertebrates and improve the river margins for juvenile fish. Very importantly, it would also allow for some natural tree regeneration, which is almost completely absent, with all the trees observed being veteran. This is a particular concern when considering the relatively short life of alders, which were the predominant species. Where present, tees currently provide valuable shade, and bank protection, cover/structure, flow diversity by their roots, and the habitat would be notably poorer without them. As such, any temptation to prune or remove low branches should be resisted.

Figure 1. Good quality trout habitat along the far RB, with alder trees providing shade and cover around their roots. Note the distinct lack vegetation diversity on the near bank and lack of tree generation on either, owing to the grazing.

The habitat in this area is further improved by woody material in the channel which provides structure, flow deflection/diversity and refuge from high flows and predators. Many clubs remove woody material during work parties to keep the river looking tidy. This is a mistake, the more structure and cover that can be provided, the more fish and greater range of fish sizes the river can support. Retaining such structure is therefore essential and is by far the easiest option for achieving high-quality habitat.

Figure 2. Retaining fallen woody material as structure within a channel greatly enhances habitat quality. The old, partially rotten tree (right of shot) is also worth retaining. Standing deadwood provides valuable habitat for invertebrates and birds, and a source of woody material to the river when they do fall.

Towards the upstream end of the first field, a few obvious land management issues were observed (Fig. 3). The buffer fence that should be protecting the LB has clearly been left open for a considerable time, as evident by the lack of vegetation either side of the fence line. This could simply be a failure to appreciate the importance of a well vegetated buffer for habitat development and subsequent bank protection, but it could be easily rectified with support from the farmer. Resolving the fencing issue would also reduce the impact of the track, which is pathway for surface run off, and the muck midden at the bank top. The distance of the latter should be a minimum of 10m from the river under the new Farming Rules For Water (www.gov.uk). Whether it is the full 10m away was not confirmed, but its proximity to the track (and potential pathway to the river) and watercourse is not advisable, especially when almost any other location in the same field would offer far greater protection. The far, RB would also benefit from fencing.

Upstream of the bridge, the channel is unnaturally straight and highly incised for an extended distance, adjoined by a relatively tight canopy of trees down either bank (Fig. 4). While this creates some over-shading for a short distance, it is not considered a problem as the mature tree canopies are beginning to find a balance. Retaining some shaded sections is always going to be beneficial, regulating water temperatures and providing areas that will still fish in bright conditions.

The roots of the bankside alders provide significant habitat opportunities, with each tree creating additional trout lies, increasing the number of fish the river can hold and providing interesting features to fish. Woody material accumulated in the channel provides additional cover and flow deflection. A large tree trunk diversifies surface flows, supplying an increased number of potential food lanes, creating a variety of lies for individual fish. At higher flows, the more significant flow deflection will drive scour into the bed, creating and maintaining deeper scour pools. The complexity of the habitat in this section partially mitigates for the lack of channel sinuosity and the habitat quality is surprisingly good; testament to the high value of bankside trees and an abundance of in-channel structure.

Highly selective coppicing, perhaps only one or two carefully selected trees over the 250m section could be beneficial, to let a little more light in on the shallower water sections. This could encourage weed growth and promote some low-level regrowth of tree branches. It would also provide woody material that could be installed to the channel, replicating the natural structure in Figure 4. However, this work is far from a necessity.

Figure 3. Several issues require resolution: the nearside (LB) buffer strip is being grazed, the far bank is un-fenced, and the track and midden create potential runoff issues.

Figure 4. An unnaturally long, straight channel section that retains sufficient structural diversity to provide some high-quality trout habitat, despite the lack of channel sinuosity.

Around the large weir at NGR NZ 48253 06893, the LB has been buffer fenced and could offer an opportunity for undertaking some tree planting (saplings or willow whips) to provide more cover in the open section (Fig. 5). Areas of the RB have been fenced, but sheep have free access to an area on the inside of the bend and the quality of riparian vegetation is reduce as a result. Fenced and un-grazed, largely tree-lined sections upstream and downstream provide much better habitat.

The weir is one of the greatest issues for habitat quality and connectivity on Skutterskelfe Angler's water and is likely to have one of the greatest impacts upon fish populations. The weir is impassable in all but the highest flows and, even then, only to a small proportion of trout and salmon, greatly inhibiting their distribution and utilisation of the habitat around the catchment. Such a large weir creates a significant impounded reach upstream, degrading several hundred meters of the habitat for rheophilic (flow-loving) species such as trout, and many of the invertebrates upon which they feed. The impounded reach also creates a notable obstruction to downstream migrating fish, be they brown trout dispersing around the catchment, or salmon or sea trout migrating to sea. The impounded reach is also easy hunting ground for predators like cormorants and goosander within the deeper, open water. Increasing the availability of structure within this reach would provide at least some protection and habitat enhancement and a fish pass could provide assistance to fish movement but prime habitat cannot develop with the weir in place.

Figure 5. The LB buffer fence downstream of the weir provides improved riparian vegetation and offers an opportunity for undertaking tree planting, but the unfenced RB is heavily grazed and would benefit from further fencing.

Figure 6. The weir creates a major obstruction to both upstream and downstream fish passage, also degrading several hundred metres of habitat upstream within the impounded reach.

Figure 7. Naturally occurring woody material within the impounded reach introduces some flow diversity, but the slow, overly deep water is uncharacteristic of what this area of the catchment should be like an provides comparatively poor habitat trout and invertebrates in. A relative abundance of trees in this section could provide material for in-channel structure to partially mitigate the homogenous habitat created by the weir.

The final section visited was downstream of Faceby Beck, around the upstream limit that is fished. A tight bend with wooded LB provides good adult trout habitat; the kind of area that always has the potential to turn up the odd larger trout (Fig. 8). Trees (live and fallen) within the margins greatly enhance the habitat and create valuable flow diversity. A large fallen tree spanning the entire width of the river had been lodged at the bend until recently but apparently was moved by the last high-water event. This nicely demonstrates not only the habitat benefits of a hands-off approach to river management but also a financial one. The tree will have provided excellent cover habitat within the channel, almost certainly also creating bed scour and developing the pool during high flows before it moved on. A free habitat enhancement that would not occur if such material is artificially removed or altered, even before any cost (time and/or money) associated with removing it. A further added benefit being that the material is retained within the river somewhere to provide further habitat enhancement.

The RB is naturally well vegetated in this area, improving bank stability and providing cover. The LB is unfenced and open to grazing. This has clearly led to bank instability, as evident by erosion bays and attempts at rock armouring of the LB (Fig. 9). While this bank still remains relatively stable, it would be highly advisable to exclude livestock and reinstate more natural stability to prevent the near certainty of major erosion in the future.

Figure 8. A naturally deep bend, with plenty of cover. Unlike the impounded depth created by weirs, the free flow found in natural pools maintains hydromorphological processes, facilitating the natural adjustment of the bed, maintaining depth and allowing the natural conveyance of water that supplies food to its residents, as well as making the water an interesting place to fish.

Figure 9. An outside bend that has previously been protected with rock. While this area remains relatively stable, it would be advisable to exclude livestock. This would facilitate regeneration and/or planting of native deciduous trees that will further assist in protecting the bank and provide replacements for the now veteran alder trees that are currently protecting the bank but are likely to be getting towards the end of their lifespan.

Several in-channel habitat structures were observed in the channel, towards the upper limit. Owing to the high-water conditions, it was not possible to ascertain their purpose as the area of the channel appeared to be naturally diverse already and not necessarily requiring additional structures. Lower flows may have revealed a specific purpose, but it is important to recognise that the natural lifts towards the tail of a pool (where these structures are located) are vital habitat in their own right, providing gravel areas for salmonid spawning and shallow water for juvenile fish.

Figure 10. Paired, upstream-facing deflectors. Their purpose at this location in the channel was not completely clear in the high-water conditions. Such features may have been more beneficial within the artificially degraded, impounded section upstream of the weir.

A brief inspection of Faceby Beck revealed potential spawning opportunities in the lower reaches, with small areas of gravel just visible through the turbid water. However, the modified nature of the channel is not conducive to the formation of pools and the associated gravel lifts that are often selected by trout for spawning. No redds were spotted and trout were observed attempting to ascend the weir a short distance upstream, suggesting that they may favour areas further upstream for spawning. The purpose of the weir was not clear, but it does create an illegitimate obstruction to fish passage as sea trout do occasional ascend the obstructions downstream (salmon and sea trout sadly being the only species recognised under our incredibly out-dated fish passage legislation). Shallow water immediately downstream further inhibits fish passage and the value of removing this obstruction that clearly inhibits fish movement into a potentially important spawning tributary should not be overlooked.

Figure 11. Faceby Beck: the straightened channel is not conducive to the formation of gravelly lifts in the bed and riffles, although some small pockets of gravel with potential for spawning were observed.

Figure 12. A small but potentially significant obstruction to upstream fish passage. This structure could be easily removed to deliver a major improvement to the potential of the beck for salmonid spawning.

4.0 Summary

Much of the habitat observed on Skutterskelfe Anglers' water is good quality and are clearly capable of producing and sustaining wild trout populations. Some small tweaks could further improve habitat quality and availability. Small scale selective coppicing to let a bit of extra light onto the shallower riffles and material for additional in-channel structure should be considered. However, the majority of the reach requires little more than buffer fencing and associated planting in the more open sections. The presence of Himalayan balsam throughout the reach is a further consideration and could potentially proliferate within a buffer strip in lieu of remedial action but, if maintained, the strip would provide far greater riparian habitat and bank stability.

There are a few other notable issues, the first being the poor water clarity. While it would be expected that the fine sediment loading of the river would elevate in high flows, particularly in a catchment with friable soils, the extent of the turbidity does suggest the input of fine sediment is excessive. This is supported by the findings of the Hutton Rudby Angling Club AV to the water downstream that was undertaken in lower summer conditions, when excess fine sediment was observed to be coating areas of the bed.

One of the greatest issues is undoubtedly the weir and associated impounded reach upstream. Ideally, options to remove the artificial structure should be investigated. It is understood that Tees Rivers Trust are already looking into options for improvements at the location and it would be in the interests of all local anglers to support that work. Improvements could be made to fish passage with a pass or easement, and within the impounded reach by installing additional in-channel structure but it would not be a substitute for entirely removing the offending weir. Other improvements to fish passage would also be highly beneficial, including removal of the weir on Faceby Beck and improvements to the road crossing at the downstream end of Potto Beck (as highlighted in the Hutton Rudby report).

It would be in the interest of Skutterskelfe anglers to support all of these actions, including financially, if necessary. This is particularly true for any resolution to the fine sediment issues. Funding from Skutterskelf Anglers contributing towards the fencing and agricultural diffuse pollution work by other organisations (including the Tee Rivers Trust) throughout the broader catchment would be money well spent, undoubtedly delivering benefits to the habitat and fishery of the Skutterskelfe reach.

It would also be beneficial to continue with/reinitiate Anglers River Fly Monitoring, along with maintaining logbooks for catches, thereby gaining a better handle on the invertebrate populations (and potential impacts upon

them) and fish numbers of the reach. Hutton Rudby AC have generated valuable data on their fishing by collecting angler catch (with effort) data to show how many fish are caught on average per hour fished; the results showing great improvements since they ceased stocking. Collecting such data would allow the relative performance of the fishery to be monitored. If the fishing/catch location within the fishery were also collected, it could also help to prioritise where improvements could be initiated.

5.0 Recommendations

Not surprisingly, many of the recommendations of this report are similar to those for the adjacent Hutton Rudby AC section but identifying the specific issues to any given reach remains a vital part of its effective management. As such, the range of recommended actions are as follow:

- Fencing would be beneficial in all currently un-fenced sections.
- Selective planting would be beneficial within fenced/livestock excluded areas, to provide additional cover and habitat structure.
- Seek agreement to remove the weir from Faceby Beck to reinstate free passage to potentially important spawning areas upstream.
- Support Tees Tees Rivers Trust in any projects to:
    - Remove weirs (or undertake fish passage improvements where removal is completely infeasible).
    - Address erosion, fine sediment input and agricultural diffuse pollution on the catchment.
    - Tackle invasive species on the catchment like Himalayan balsam and mink.
- Seek reinstatement of livestock exclusion to the existing buffer fenced area depicted in Fig. 3. Seeking voluntary agreement from the farmer to relocate the midden would also be beneficial.
- Retain all naturally occurring in-channel woody material wherever possible. This includes low-hanging branches.
- Where appropriate, undertake light-touch tree work such as laying and installing the very occasional in-channel woody structure.
- Collect angler catch data. This will provide valuable insight into fishery performance over the years, highlighting natural annual fluctuations and any major impacts upon the fish populations and help prioritise enhancements.

- As with the above, continuing to undertake routine invertebrate monitoring will be beneficial in maintaining a good understanding of the invertebrate community composition and will potentially highlight issues missed by other monitoring.
- It would be beneficial if the club initiated a mink trapping programme. The best way to do this is with rafts (https://www.gwct.org.uk/wildlife/research/mammals/american-mink/the-gwct-mink-raft/).

5.1 Tree work

5.1.1 Low cover

One or two of the trees along the incised reach identified in Fig. 4 could be coppiced to let some light in and reinvigorate low-level bush regrowth. This should ideally be undertaken within the dormant season to greatly reduce the potential for killing the tree – one of the trees is a multiple stem, which does limit the risk.

5.1.2 In-channel structure

Where multiple tree trunks are present, one could be cut (with no significant detriment to the overall canopy or other habitats) and lodged between two or more the remaining stems, mimicking naturally lodged woody material.

Figure 13. A lodged flow deflector – the technique can be used with a single pole (primarily to increase scour) or a branched limb (to create greater flow dissipation). The elevated butt end (bank end) reduces the potential detrimental bank scour usually associated with d/s deflectors as a through-flow is maintained along the bank.

An alternative, naturalistic lodged flow deflector method that is equally simple utilises a deflector with multiple branches. It simply involves hooking one of the branches around an upright tree (Fig. 14). The example uses a medium-sized branch, but any size of branch or tree can be employed providing the anchor tree is stable and of sufficient size.

Figure 14. A medium-sized piece of lodged woody material which is securely anchored in place against an upright tree.

5.1.3 Tree planting

The easiest way of establishing willow is by pushing short sections of freshly cut willow whip into areas of wet ground, ideally close to the waterline. Whip planting can be undertaken at any time of the year but will have the greatest success during the dormant season, shortly before spring growth begins (ideally late Jan-March). This kind of planting should be undertaken sparingly to avoid overpopulation by willows.

Whips should be planted into the ground so that there is a greater length ($^2/_3$) within the ground, to minimise the distance that water has to be transported up the stem. Planting them on a shallow d/s angle will also ease water transport within the developing shrub and reduce the potential for it catching debris and being ripped out. Leaving 300-400mm of whip protruding from the ground is sufficient, providing they protrude well past the surrounding vegetation (to allow access to light). Whips of 5mm-25mm diameter tend to take best, but even large branches can be used. If undertaken during the growing season, care should be taken not to leave

excessive amounts of foliage on the whips as these greatly increase the rate of transpiration and can lead to their dehydration.

5.0 Making it Happen

- WTT may be able to offer further assistance such as:
- WTT Project Proposal
    - WTT can devise a more detailed project proposal (PP) report. This would usually detail the next steps to take in initiating any improvements, highlighting specific areas for work, what exactly is required and how it can be undertaken. The PP report could then form part of any required consent applications.
- WTT Practical Visit
    - Where recipients require assistance to carry out the improvements highlighted in an advisory report, there is the possibility of WTT staff conducting a practical visit. This would consist of 1-3 days' work, with a WTT Conservation Officer(s) teaming up with interested parties to demonstrate habitat enhancement methods (e.g. tree kickers and willow laying etc.).
- WTT presentation/Q&A session
    - Where recipients are unsure about the issues raised in the AV report, it is possible that your local conservation officer may be able to attend a meeting to explain the concepts in more detail.

In these examples, the recipient would be asked to contribute to the reasonable travel and subsistence costs of the WTT Officer.

6.0 Further information

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/wtt-publications

We have 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 populations and managing invasive species.

The DVD is available to buy for £10.00 from our website shop www.wildtrout.org/shop/products/rivers-working-for-wild-trout-dvd or by calling the WTT office on 02392 570985.

7.0 Acknowledgement

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8.0 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.