

WILD TROUT TRUST

Stanley Ghyll Beck

River Esk Catchment

(West Cumbria)

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Summary

- The current, low intervention management of Stanley Ghyll Beck is paying dividends, as demonstrated by the naturally diverse and adaptable habitat, and temptation to remove woody material from the channel or to 'tidy' the watercourse should be resisted.
- Non-native tree and shrub species create an impact upon the watercourse and the broader woodland ecology. The beneficial eradication work already being undertaken should be commended and continued.
- Light-touch habitat improvements could be undertaken to utilise some of the tree and brash material generated by removing some of the non-native species, but this should be undertaken sparingly as the extant in-channel and riparian habitat is already of a naturally high quality.

1. Introduction

The Wild Trout Trust were invited by the Lake District National Park Authority (LDNPA) to look at a short section of Stanley Ghyll Beck, an upper tributary of the River Esk in West Cumbria. This report will assess the general habitat quality and recommend any improvements that could be made. The section of beck visited is a short length of watercourse between an impassable waterfall and the confluence with the River Esk, at the downstream end.

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.

2. Habitat assessment



Figure 1. Towards the upstream end of the reach, the channel is steep and relatively straight, constrained within a bedrock gorge. The habitat is a combination of small pools and pockets of slack water, interspersed by chutes and falls, with the occasional larger pool in which larger adult trout are likely to reside. Areas of potential spawning substrate are present in the tails of the larger pools, but the high energy and coarse substrate of the beck means that potential is limited, and juvenile dispersal from other areas is likely to play a large part in populating the reach. Rhododendron shrubs create a negative impact upon riparian habitat and the broader woodland, overshadowing and outcompeting native species. Their leaves are slow to degrade and less palatable to invertebrates than those of native species, so there is also likely to be a localised impact upon productivity. It is therefore encouraging that the LDNPA are attempting to eradicate the issue through cutting and treating with herbicide plugs.



Figure 2. The majority of the bed material in the upper section is coarse, creating plenty of niches for flow-loving invertebrates and juvenile fish at low flow, but a hostile channel in high flow, when woody material provides an important source of cover and shelter.



Figure 3. Branches and woody material within the channel help to retain other organic material, like leaves, providing an important source of nutrients and productivity as food for invertebrates. In a deep, wooded and shaded gorge where reduced light penetration limits primary production, the importance of this material should not be overlooked.



Figure 4. As the valley gradient reduces the associated reduction in stream power facilitates a wider and more sinuous channel, where a greater diversity of substrate is retained (red circle).

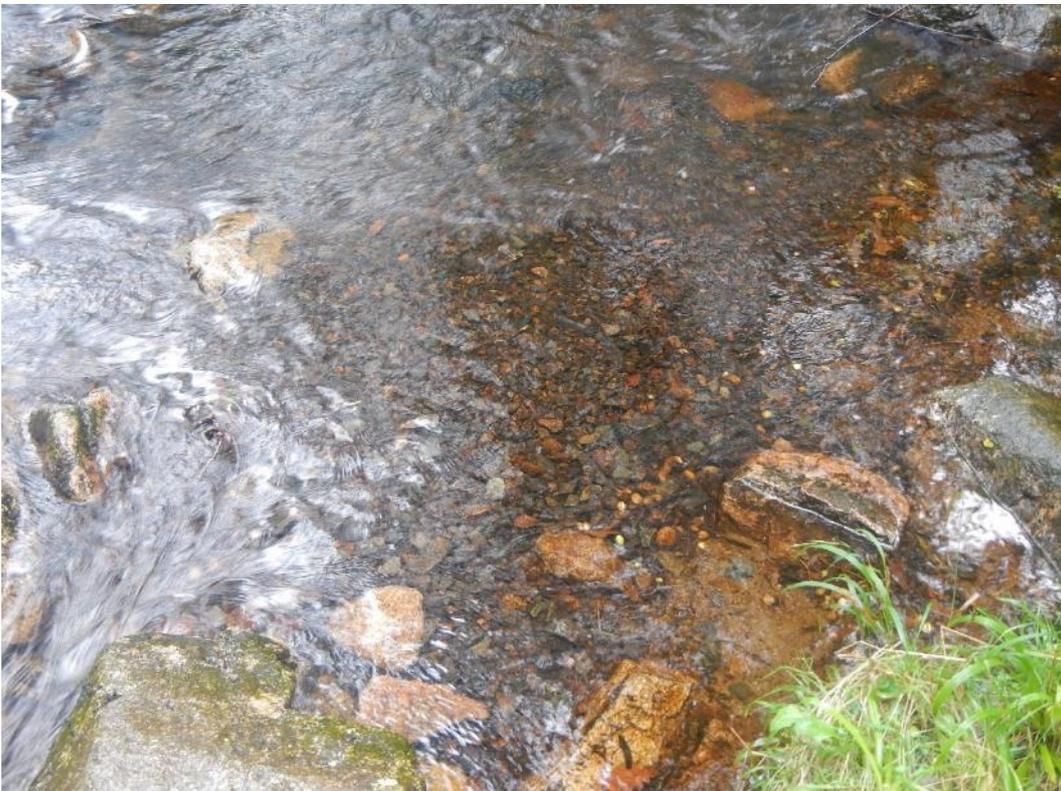


Figure 5. The slower flowing area depicted in Figure 4. As the valley gradient reduces the associated reduction in stream power facilitates a wider and more sinuous channel, where a greater diversity of substrate is retained (red circle). : much smaller gravel substrate can be seen in this area, suitable for resident trout spawning. This substrate diversity also provides habitat for a range of native invertebrates.



Figure 6. The varied canopy of the woodland creates a natural balance of light and shade, with the low cover provided by smaller shrubs and understory complementing the taller mature canopy, but without the overshading that can occur where uniform age class/height canopies develop. However, note the continued presence of rhododendron (red circle) which could ultimately take over and disrupt the natural balance, if left unchecked.



Figure 7. Looking upstream, on the RB (blue circle), some of the overhanging hazel could be laid down into or along the channel. On the LB (red circle), erosion threatens the mature conifer on the bank top. If possible, this should ultimately be allowed to fall naturally into the channel. The footpath may need to be re-routed further away from the watercourse but facilitating natural input of trees to the beck would be greatly beneficial.



Figure 8. Just downstream, it was encouraging to see that treefall and the vital input of large woody material is already being allowed to occur and remain in situ. This tree may eventually slew round, or become outflanked by lateral erosion but, in the process further beneficial habitat will result.



Figure 9. Boulders appear to have been used historically to prevent high flow shortcutting a bend (NY 17382 00110). These high flow pathways are a natural feature of woodland watercourses and should not be prevented. The boulder bund is already breaching, and it would be beneficial to accelerate that process. Doing so would reduce the peak flow energy in the channel downstream through the meander and take pressure off the RB at the bend downstream, which is close to the edge of the woodland and adjacent agricultural land.



Figure 10. A small island in the channel on the outside meander bend downstream. Note how the varied channel structure facilitates a range of flows and bed levels, contributing to a diverse wooded watercourse environment.



Figure 11. Another fallen tree creates increased water depth upstream and downstream, increased gravel deposition within the impoundment (red circle) and increased lateral erosion around the stump that will facilitate a more varied/sinuous course. Unlike the negative and long-lasting issues of man-made impoundments, the impact of this semi-permeable structure will be short-lived, providing various beneficial habitat as it adjusts, before eventually washing out. The transitional nature of the structure avoids the infiltration with fine sediment and bed compaction that occurs with fixed, artificial weirs.



Figure 12. More non-native species were observed in the lower reaches of the beck , where what is thought to be Leyland cypress was observed (left of shot). Felling these trees to allow replacement with native species could also generate additional material for introduction to the channel.

3. Summary

The general hands-off management of Stanley Ghyll Beck is working well and is reflected in the naturally diverse, high-quality habitat observed. Leaving trees and branches where they fall in the channel is sadly uncommon on many river reaches, so it is great to see the LDNPA embracing such beneficial treatment. Woody material accumulations can sometimes be perceived as unsightly to the general public, who incorrectly interpret it as a sign a watercourse is not being looked after. In reality, the hands-off approach to river management it is one of the best ways to safeguard the health of watercourse habitat, particularly on high energy, upland watercourses. This is also true for the channel and course of the beck, which should be allowed to adjust and develop, wherever practical to do so, with the temptation to prevent erosion resisted. Too many watercourses are artificially constrained, when allowing natural rates of erosion and channel migration is required to maintain quality high habitat. The largely natural environment of the wood, with well-vegetated banks, facilitates this hands-off approach, providing bank stability that will allow any bank adjustment to occur at a naturally controlled rate.

However, some other aspects of habitat management/improvement would be beneficial. The various non-native trees, shrubs and plants around the woodland create an additional stress on the local ecology and should be

eradicated wherever possible to allow native species to flourish. As such, the great work already being undertaken by the LDNPA, contractors and volunteers to eradicate rhododendron should continue, with other non-native species also tackled. Some of the material generated from this work could be utilised to increase the availability of in-channel woody material and cover (see recommendations).

4. Recommendations

- Continue with the general hands-off, light touch management.
- Allow natural erosion to occur.
- Allow trees to fall into the channel and naturally adjust over time.
- Eradicate the non-native species that have become established within the woodland.
- Utilise some of the material generated through non-native tree/shrub eradication for in-channel woody material. Larger non-native conifers could be lodged with the channel to replicate natural treefall (see lodged woody material). Owing to the comparatively slow decomposition and low nutrient accessibility of rhododendron leaves, it might be beneficial to allow the leaves to wilt and fall from the stems before they are introduced to the channel (then ideally also removing or mulching the leaves).
- Lay selected hazels along the bank of the beck to introduce additional low cover. N.B. This may not be necessary if similar habitat can be produced with the non-native species brash.
- Remove the bund of boulders that restricts high flows bypassing the large bend.

4.1. Introducing cover and woody material

4.1.1. Laying

Where multiple trees are present, the occasional trunk can be used to create a habitat enhancement feature, with no significant detriment to the overall habitat. This could entail partially cutting through trunk, as you would when laying a hedge, so that the trunk/branch remains attached (Figure 13). This technique works well with hazel and willow.



Figure 13. Willow hinged into the river margin to increase cover and structure. The method involves cutting part way through the branch, quickly through the first two thirds, then continuing until it collapses down over the river. The depth of the cut should be limited to only that which is required to bend the limb over, as this will maintain maximum size and strength of the hinge and the health of the tree/shrub.

4.1.2. Lodged woody material

Alternatively, a trunk can be felled to create a coppice, encouraging low-level regrowth from the stool and providing material that can be lodged between two or more standing trunks (Figure 14), or hung over another tree if a 'V' branch is available (Figure 15).



Figure 14. A lodged flow deflector securely but naturally lodged in place between to upright trees (red circle). The technique can utilise 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 score usually associated with d/s deflectors as a through-flow is maintained along the bank.



Figure 15. Medium-sized, lodged woody material, securely anchored by the 'V' of the branches against an upright tree.

5. Further information

The WTT may be able to offer further assistance such as:

- 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.).

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

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.

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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.