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Axe Vale Rivers Association, Seaborough, River Axe

An Advisory Visit by the Wild Trout Trust
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Nick Lawrence
nlawrence@wildtrout.org

Introduction

This report is the output of a Wild Trout Trust visit undertaken to the River Axe at Seaborough, Dorset (National Grid Reference: ST 42486 05769 to ST 44218 05404) in July 2020. The visit was requested by Axe Vale Rivers Association (AVRA), primarily to focus on options to improve the river habitat for wild brown trout (*Salmo trutta*) and to sympathetically manage the reach as a nursery area; many other subjects were discussed during the visit, especially agricultural pollution.

Comments in this report are based on observations on the day of the site visit, and discussions with AVRA members.

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.

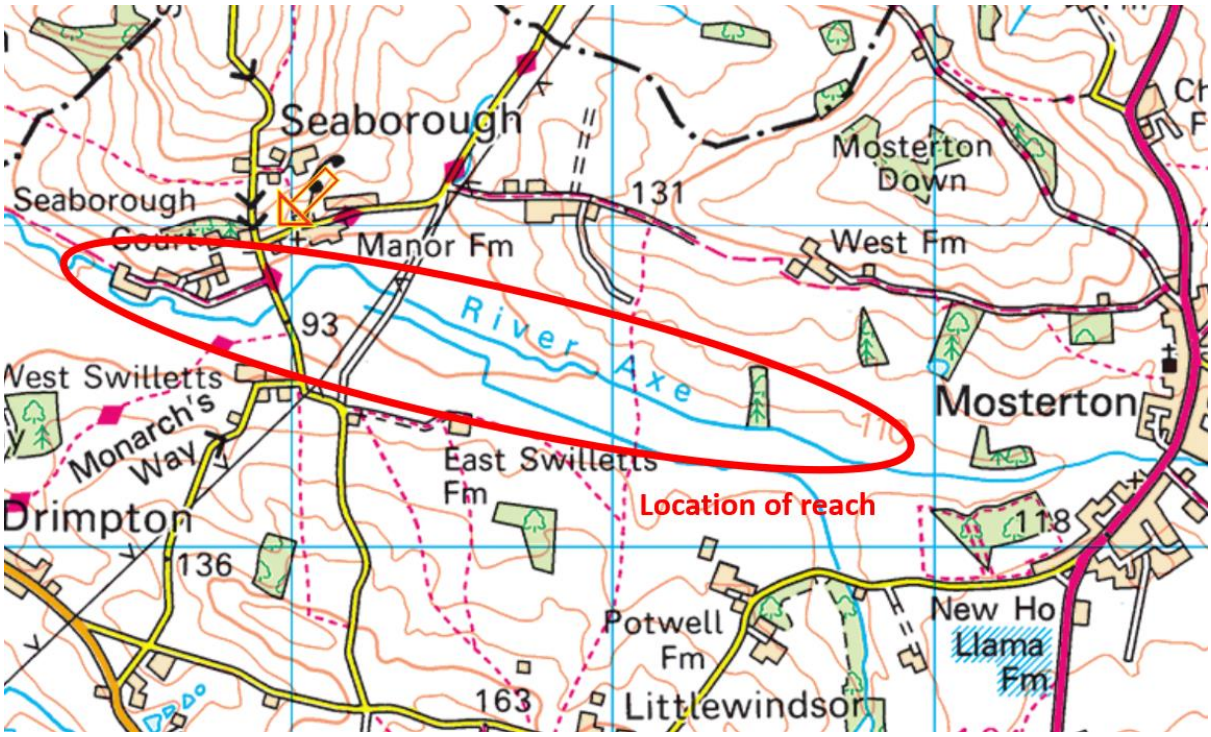


Figure 1: A map showing the section of the River Axe visited.

Catchment and Fishery Overview

The River Axe rises from springs between Crewkerne in Somerset and Beaminster in Dorset and flows west into Devon before turning southwest at Chard junction and flowing through Axminster, Colyford and Seaton. The Axe collects flow from Temple Brook and the River Synderford near its headwaters, the Blackwater River and the River Yarty in its midwaters. Other important tributaries include the Umborne Brook and the River Coly before the Axe enters the English Channel at Seaton Bay.

The underlying geology of the riverbed is alluvium with areas of valley gravel, clay, shale and marl. The water is base-rich (alkaline) with a high content of dissolved minerals.

For 13 kilometres, between the confluence with the Blackwater River and the tidal limit near Colyford, the river is designated as a Site of Special Scientific Interest (SSSI). The designation is due to the Axe supporting an exceptionally diverse range of aquatic and marginal plant species, as well as several threatened animal species including salmon, bullhead, otter and medicinal leech. The active morphology of the Axe, especially in the upper reaches, has ensured a physically diverse range of natural features are present. In addition, the lower reaches are contrastingly stable, further broadening the range of different habitat types within the river. To reinforce the river's conservation status, it is also a Special Area of Conservation (SAC).

Sea trout (known locally as 'peal') and salmon stocks in the Axe reportedly crashed in the 1980s and early 1990s, with agricultural pollution and excessive erosion causing degradation of spawning habitat implicated. Since then, a native broodstock scheme has been undertaken in an attempt to boost sea trout populations, along with a number of habitat improvements such as weir removals and restoration of spawning beds, carried out by the AVRA.

The river is failing its targets for macrophytes (plants) under the Water Framework Directive (WFD) and is suffering an overabundance of diatoms (algae) and phosphates, suggesting that agricultural pollution is probably a significant issue.

Pollution instances from local agriculture are reported to be rife; enforcement of the farming rules for water and engagement with the local farming community will be key in the river's recovery.

The River Axe water body classification is available on the Environment Agency website: https://environment.data.gov.uk/catchment-planning/WaterBody/GB108045014840

Habitat Assessment

For the purposes of this report, the section of the river visited is described from the downstream extent of AVRA's water, at Seaborough Court, to the upstream boundary just downstream of the village of Mosterton.

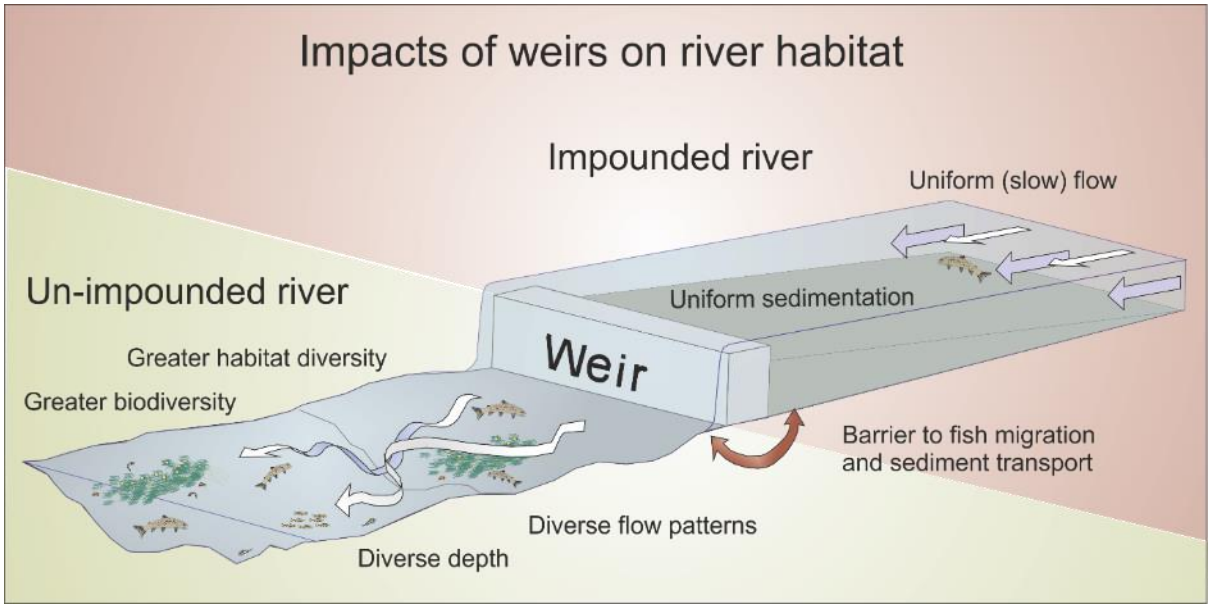
At the bottom of the reach, the river passes through a farm yard at Seaborough Court (photo 1), the site of an old bridge that is being replaced, but the damage evident during the visit to river banks and from vehicles fording it is of some concern. This type of work needs to consider potential environment impact and should follow the correct consenting procedures to ensure work is carried out sensitively. In the meantime, this bank will take some time to recover and it is now exposed to erosive processes that were not there previously.

Photo 1: Farmyard at Seaborough Court: notable plastic pollution and disturbance of riverbanks.

Photo 2: Summer weir, interrupting natural pool and riffle formations.

Upstream from the farmyard, the river takes on a more formal setting through a garden and beyond into woodland. The river here has good habitat and a nice meanders, though a number of summer weirs (photos 2 & 3) have been created to form small pools, to the detriment of the river upstream of them, impacting the natural river processes, hindering gravel and sediment movement. Note the darker gravels upstream of the weir in photo 2 and brighter gravels downstream. Drawing 1 demonstrates exactly what is happening around these weirs.

Photo 3: Another summer weir: note laminar water upstream and dynamic river processes downstream.



Drawing 1: The effects a weir can have upon a riverine environment.

Photo 4: Downstream of the weirs, the habitat was good with lush overhanging trees and abundant gravel seams.

The habitats downstream of the weirs, in the wooded section, were rich in dynamic processes, with a good shade/light ratio in equal measure. The low overhanging cover on the RB on the bend in photo 4 (left of shot) will provide a good bolt hole for trout. The river throughout has rich seams of gravel that is readily available through bank erosion, which no doubt, if in good condition scoured and cleaned by sediment-free water, would be a good spawning medium for trout and sea trout.

There was evidence of historic dredging downstream of the road at Manor Farm where a large bund of gravel was piled up on the banks, now vegetated over; the bund may well have been from historic straightening and agricultural land management. This bund (photo 5) should be broken to reconnect the floodplain with the river which will help with flood water storage and allow sediments and nutrients to be absorbed by the land. The river in times of flood is kept within its banks, further incising the channel; the high flow energy created will be detrimental to any trout redds and prevents the river's natural interaction with its floodplain.

Photo 5: A bund possibly from historic dredging and straightening: it is likely to be formed from river gravels. It disconnects the river from its floodplain and retains high flows in channel.

Photo 6: Geomorphology in action! From a previously straightened reach the river decided to cut a new meander and start to heal itself.

There is evidence of the river attempting to right the wrongs of the past (photo 6), where a previously straightened reach has now cut a new, meandering path through the floodplain, evidence that rivers need room to move around the floodplain. It also shows how new gravels are available to the river, with an eroding RB. A livestock fence would be useful here to diversify marginal habitat and encourage tree regeneration; if a fence is installed, this may well need some strategic management to ensure invasive monocultures do not proliferate i.e. full shading of willow. This classic pool and riffle meandering sequence is scarce in the reach of water visited. The upper section is mainly straightened; further evidence of the previous meandering channel is seen in photo 7, where the old river channels (paleochannels) can be seen meandering through what is now a field, with the straightened channel moved to the edge of the floodplain. This historic straightening can be blamed for the lack of natural river features throughout the reach.

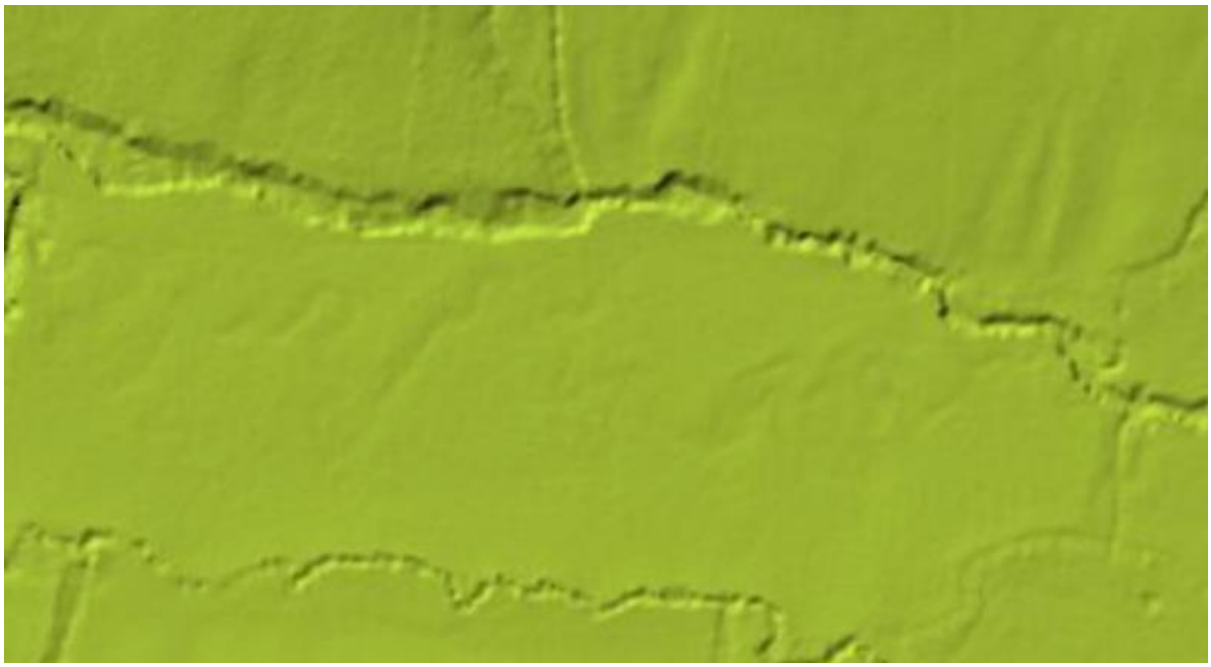


Photo 7: LIDAR map (National Library of Scotland): note straightened channel top and old paleochannels meandering through what is now a grass field.

In areas with reasonable trout habitat, there were many fewer fish spotted than expected for the apparent quality of the habitat. A systemic problem was evident throughout the reach, with a thick sludge and algae (photo 8) smothering what could be quality spawning gravels. With many gravels showing this kind of stress and historic experiments with sedimentation of gravels done by members of AVRA, this is a catastrophic problem for trout, other native fish species and invertebrate communities of the river. An EA report published in 2019 noted widespread agricultural pollution on the Axe; this visit suggests that the issue remains on the upper river which could, and should, be a pristine environment, packed with hundreds of juvenile trout and rich with invertebrates.

Photo 8: Extreme suffocation of gravels, overlain by algae and sediment.

Photo 9: Quality shade over a pool, perfect for adult trout.

Downstream of the road bridge at Manor Farm, the river is diverse in habitat, with trees and scrub dominating providing good quality shade over pooled areas (photo 9); areas such as this are prime habitat for adult trout and should be conserved and replicated where possible elsewhere.

This area had many “gifts from nature” as in photo 10, where a goat willow has self-hinged into the river to provide good low cover, perfect for fish to avoid predators; such areas (photo 9 & 10) were some of the best habitat within the whole reach visited and the benign neglect that is employed as a management technique here should be continued and applauded.

Photo 10: Fantastic low willow cover from natural treefall.

Upstream of the road bridge at Manor Farm, the river and land changes drastically, with the channel more modified through straightening and, in some areas, moved to the edge of the floodplain.

The land use is open grazing and hay cultivation, often with inadequate or no fencing, which leads to a biodiversity loss in the riparian habitats of the river, due to sheep and cattle grazing. A typical scenario is depicted in photo 11: livestock grazing to the edge of the river, leaving no room for plant and tree diversity. If a large buffer strip were established here, it would allow plants to flourish and in turn improve the resilience of the river.

One notable point about this upper section is that the river has been historically moved to the north edge of the floodplain into a relatively straight channel; this again limits the productivity of the reach due to the river not producing natural features (pool and riffles). This can be deciphered by LIDAR imagery as shown in photo 7 which clearly shows paleochannels meandering through a grass field. Given the right circumstances, the river could be returned to its natural course here, enabling it to function properly with its floodplain once again.

Photo 11: A typical scenario on the upper reach, sheep grazed to the edge of the river with a lack of riparian trees and marginal plants.

Due to the lack of diverse marginal habitats and trees because of the inadequate buffer strips, the banks are prone to erosion. The Axe is a highly erosive river and needs space to move on its floodplain; whilst erosion is seen by some as the enemy, this river needs space and buffered areas to allow its movement, without causing alarm to land managers.

There was some evidence of unsustainable efforts by land managers to address what they see as problematical erosion (photo 12). The river here needs space within the floodplain to move around and attempts to constrain it within a small channel with little to no buffer strips are futile. With the start of farm cluster groups and new Environmental Land Management Schemes (ELMS), some improved practice may be attempted. Iorwerth Watkins yog@wrt.org.uk at Westcountry Rivers Trust may be able to help, through his involvement ELMS trials in the catchment.

As noted earlier, the Axe suffers from catastrophic water quality issues, chronic and acute, with diffuse and point source pollution; the 2019 EA report highlighted some of these problems and the hope locally is that some of these issues are being addressed. However, AVRA members lack hope: slurry lagoons perched on the edge of the valley (photo 13) point to an accident waiting to happen!

Photo 12: Concrete dumped in the river in the vain attempt to reduce erosion! It simply deflects the river's energy downstream and will eventually fail leaving concrete in the river.

Photo 13: A slurry lagoon on the edge of the valley, centre of shot; its failure would lead to environmental disaster.

Towards the top of the reach, the buffer strips become slightly more established, with trees and shrubs, but the LB is mainly still grazed grassland with no fencing. Where there has been some effective livestock exclusion, the river is starting to function more normally.

Photo 14 is a good example of a naturalised bank, diverse in plants providing lush overhanging vegetation for fish cover, especially over the pool. The area of concern yet again is the condition of the gravels, overlain with sediment and algae, likely to be a limiting factor for fish.

Photo 14: Where the LB has been left to naturalise, there is good plant diversity and pool formations, with quality low cover. Note again, however, the gravels covered in sediment and algae.

The river upstream of photo 14 becomes much wilder with some tree cover on both banks; although the river here is straightened to the edge of the floodplain, it is naturalising well. The river here had some wonderful gifts from nature with natural wood falling and leaning into the channel, creating quality features which will provide habitat diversity and refuge for fish.

Natural wood features help kick start natural processes on rivers and without wood falling into them these processes can take a lot longer to happen. This is another reason to give the river space and provide buffer areas for natural tree regeneration. There were many examples of natural treefall (photo 15) which are providing additional habitat benefits; again, these areas should be encouraged through benign neglect.

Photo 15: Natural tree fall helping in diversifying habitat, no action required here.

This upper section has some of the best tree cover on the whole reach, which is testament to buffer strips working, excluding agricultural practices to allow succession of woodland. This particular area could have some small-scale enhancement works where the right tree opportunities present themselves (photo 16 & 17). Depending on the scenario, this could be a hinged tree, tree kicker or a lodged woody material feature, bespoke to the situation. The willows right of shot on photo 16 could be hinged into the channel to kick start some natural processes, for example, as in photo 20 in the appendix.

The area in photo 17 could be enhanced through the use of woody material, in the form of the trees dropped into the channel demonstrated with the white arrow, this will provide additional cover for fish and diversify the riverbed to scour and clean gravels.

The Appendix shows examples of different types of woody material and the variety of ways these can be introduced to the channel.

Photo 16: A typical reach where there is tree cover on both banks which presents many opportunities for habitat enhancement using woody material.

Photo 17: A lovely pool sequence with dappled shade; the trees top left of shot could be introduced to the channel to provide extra cover, denoted by white arrow

Where buffer strips are inadequate, and fences are placed too close to the river, conflict normally arises as the river is seen as the problem. In photo 18, the fence was placed too close to the river, allowing inadequate space for the river to move around and tree succession within a buffer strip to help slow the erosion process and tie the bank together with roots.

Photo 18: Insufficient buffer, erosion has taken place before the bank has stabilised or been strengthened through tree roots. Fences should be set well back from the river, 5 metres at a minimum.

Recommendations

In order for the trout population in the upper Axe at Seaborough to reach its full potential, the following actions are recommended:

- Continue to employ light touch management, e.g. leave fallen trees in the river. If a tree does fall in a place where it might cause a problem, give it a couple of floods to see how it settles. After this and if the tree is problematical, move it into a more favourable position and secure it with posts and wire or steel cable to retain the ecological (and fishery) benefit.

- Where tree cover is very dense and the river is over-shaded (indicated by a noticeable absence of aquatic vegetation, and/or greater than 50% tree shading), instigate tree works to open up some occasional skylights in the canopy (mainly in the upper section). If required, programme a rotation of pollarding/coppicing works focussing on the southern banks, with the aim of introducing light over shallow, faster-flowing sections. Try to retain as much low-lying cover as possible, especially over good pools.

- In conjunction with some skylighting works encompassing some coppicing or pollarding (mostly willow), use some of the trees to boost habitat instream either hinging/ lodging or

cabling (see appendix) into the channel in a downstream direction. Such trees should be carefully selected for optimal benefit, in consultation with the WTT to identify the best opportunities.

- Engage with farmers in a proactive way, to attempt to co-exist without conflict, this could be applying for some fisheries improvement funding (FIP) to fence or refence sufficient buffer strips, including cattle drinking areas, which could benefit both parties. WTT can help here.

- Encourage work aimed at improving water quality; for example, Westcountry Rivers Trust (WRT) may be willing to undertake some wet weather walkovers to map sediment ingress from land use. Issues considered to breach the farming rules for water (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/695598/farming-rules-for-water-policy-paper-v2.pdf) can be reported to the EA pollution hotline 0800 80 70 60.

- Engage with Iorwerth Watkins yog@wrt.org.uk who is involved in some pilot environmental land management (ELMS) schemes in the catchment.

- Explore the possibilities of reinstating the floodplain, lowering banks or dredged bunds to reconnect the floodplain for its intended purpose of storing floodwater and allowing sediment to drop out of the river onto the floodplain. This could be part of an ambitious river restoration project, reinstating the river to a previous course; the EA may be interested. WTT would be happy to act as a broker to help such a meeting happen.

Making It Happen

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

- Help obtaining the necessary consents for carrying out in-stream works, from either the local authority or Environment Agency (depending upon whether the river is designated Main River or not).

- A practical visit, which involves a visit from a WTT Conservation Officer to demonstrate the habitat improvement techniques outlined. This enables recipients to obtain on the ground training in 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 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: http://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 https://www.wildtrout.org/shop/products/rivers-working-for-wild-trout-dvd or by calling the WTT office on 02392 570985.

Acknowledgement

The Wild Trout Trust would like to thank the Environment Agency for their continued support of the advisory visit service.

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

Appendix

Photo 19: Hinged willow on the River Test. Hazel, small willows and small alders can be hinged into a river, creating diversity of flow and in-stream cover for fish. The trees are hinged in a similar manor to hedge laying, where the tree is partially cut through at the base and laid into the margins. Chestnut stakes and fencing wire can be used to secure the trees in place. Willow will survive perfectly well even with 70% of the branches submerged; however, hazel and alder should be laid to retain much of the structure above water level.

Photo 20: Another example of a tree successfully hinged into the margins of a river to improve habitat diversity.

Photo 16: Lodged woody material, the most natural of methods to mimic naturally fallen trees, wedged in another tree to secure it with no other materials required.

Photo 17: Another example of lodged woody material wedged between tree trunks to brace it against flows, as secure as any posts and wire or cabling.

Photo 21: A tree kicker cabled to an existing tree stump on the River Yeo. Kicker tethers should be as short as can be realistically achieved: apart from too much metal cable being unsightly and unnatural, the risks of the trees being stranded on the banks in floods are significantly increased. Hiring or investing in a hand winch would allow the kickers to be winched back toward the stump, reducing the amount of cable needed, which in turn will reduce the likelihood of the kicker being stranded on the bank after high flows.