Advisory Visit Report

River Stour

Whichford Mill

October 2025

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Contents

Key Findings

- The watercourse around Whichford Mill has been heavily modified through historic dredging, impacting the habitat available for aquatic wildlife.

- The section upstream and downstream of the Mill differ from each other slightly, offering distinct opportunities for actions that provide ecological or general environmental benefits.

- While heavily degraded, deposition of river gravels throughout the lower section provides potential for aquatic ecosystem diversity, especially gravel-spawning fish species and a range of aquatic insects.

- Riparian habitats along the banksides and along the margins of the watercourse are of mixed quality, but some better examples of habitat exist together with several opportunities for enhancing habitats further.

- Several barriers were seen in the channel that are impacting river processes or connectivity for aquatic species. There are opportunities to remediate the issues and enhance habitats along the reach.

1. Introduction

The Wild Trout Trust was contacted to carry out a visit for Whichford Mill on the upper Warwickshire River Stour. The visit was conducted by Ed Noyes, Conservation Officer Midlands and West, during late September 2025. The visit was also attended by the Severn Rivers Trust's Warwickshire Avon Catchment Restoration Officer. The aim of the visit was to assess the current condition of the watercourse, recommend any improvements to habitat for the local aquatic ecology and discuss how to make things happen.

Specific locations are identified using decimal latitude and longitude (e.g. **56.044896098, -3.16176523829**), which can be pasted straight into Google Maps to identify locations. Figure references within the text of the report are hyperlinked (green font), so holding Ctrl and left-clicking on them will move to that point within the document.

Standard convention is applied throughout the report with respect to bank identification, i.e. the banks are designated left hand bank (LHB) or right-hand bank (RHB) whilst looking downstream.

2. Background

Catchment overview.

The Stour rises off the northern edge of the Cotswold escarpment, at a height of nearly 200m above sea level, just north-west of Wiggington Heath (Map 1). It flows for approximately 47 miles, joining the Warwickshire Avon by Stratford upon Avon. The elevation of the ground in the upper catchment means the Stour cuts down through some relatively steep sided valleys from its headwaters, changing to broad, low gradient flood plains below the village of Tredington, down to its confluence with the Avon.

The catchment is made up of mixed geologies but primarily consists of mudstones and pockets of limestone, resulting in base rich and fertile soils. Land use is dominated by intensive farming, with livestock predominant in the upper catchment and arable in the lower half. There are multiple villages located along the river and the much larger town of Shipston-on-Stour around halfway along the watercourse.

The geography of the catchment, its land use, and the high ground in the upper catchment makes the river very responsive to rainfall events, and flooding is an issue in many locations along the watercourse. The river level and flow gauge at Shipston shows the river can rise by the order of 2-3m within hours following significant rain; Hydrology Data Explorer - Shipston

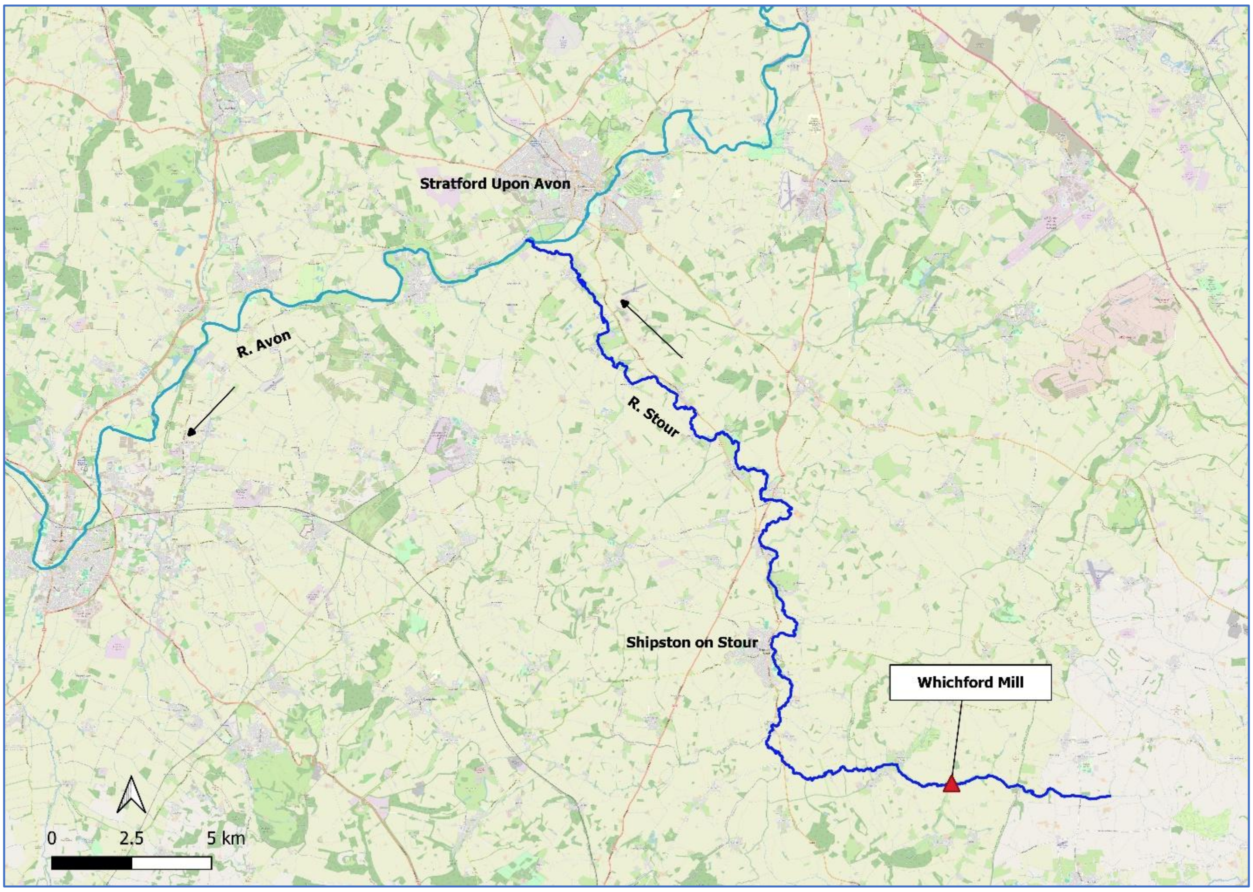
The Stour's physical habitats, water quality and the quality of the aquatic ecology present in the river is monitored by the Environment Agency, through Water Framework Directive (WFD) metrics. This grades watercourses from ecologically 'High' through 'Good', 'Moderate', 'Poor' down to 'Bad', with the aim of achieving 'Good', based on a range of recorded parameters (Table 1). The lowest scoring parameter dictates the overall score. The Stour is currently scored as 'Moderate' ecological status due to pressures on the water quality in the catchment. The specific issues are described under the Reasons for Not Achieving Good (RNAG). The two listed are both diffuse sources of pollution (from agriculture) relating to issues with phosphate.

Interestingly, fish do not form part of the WFD assessment on the Stour (they are usually an important component), as they are monitored at several sites in the middle and lower catchment on a regular basis. The fish species detected provide valuable information on the health of the catchment. A good mix of species are recorded in these surveys, reflecting the range of habitats and opportunities available for fish species present. The 15 species recorded are:

Brown trout, roach, chub, perch, common bream, minnow, stone loach, bullhead, pike, dace, eel, brook lamprey, 3-spined stickleback, gudgeon.

Table 1. Waterbody details

River	Stour
Waterbody Name	Stour (Warks) – source to conf Nethercote Bk LINK: Stour (Warks) - source to conf Nethercote Bk | Catchment Data Explorer | Catchment Data Explorer
Waterbody ID	GB109054039860
Current Ecological Quality	**Moderate** Invertebrates = high; Macrophytes = moderate; Phys-Chem = high/ Phosphate = moderate
U/S limit inspected	52.026110 , -1.5382585
D/S limit inspected	52.025469 , -1.5436993
Distance inspected	Approx. 500m



Map 1 Overview of Stour catchment and location of Whichford Mill.

3. Habitat Assessment

The Whichford Mill section of the Stour is split into two distinct sections; a shorter section upstream of the Mill, in a steep and confined valley, and the longer downstream section where the valley has opened out a bit to allow a wider floodplain to develop (Map 2).

Map 2 The section of watercourse inspected during the visit.

Starting at the upstream end, it soon becomes apparent the Stour has been modified at some point in history, dredged and over-deepened (Photo 1). This is likely due to agricultural practice in the latter half of the 20th century, where modifying rivers to get water to run as fast as possible down the catchment was encouraged for land drainage. Unfortunately, this physically removes any of the natural and varied habitat the river would ordinarily form, which good quality communities of river wildlife are dependent on.

Photo 1 (52.025990 , -1.5390821) The channel around the upstream extent of the upper section; although the channel meanders, it has been over deepened, and the channel incised following drainage work.

Rivers naturally meander, eroding outer bends and depositing river gravels on inner bends and as riffles across the channel (Figure 1). This natural process creates varied depths and flow speeds, essential for insects (macroinvertebrates) and fish species to complete their life cycles. A continuous sequence of pool and riffle features provides a template for stream-life to thrive. Coarse river gravels, generally between the size of a pea and a walnut, create clear spaces between individual gravel particles that many stream species rely on for either shelter or spawning. Dredging disrupts this by removing coarse sediments and natural morphology which destroys habitat diversity. It also promotes silt build-up when river levels drop, especially when runoff from farmland upstream adds un-naturally large volumes of fine sediment (silt). This silt then smothers gravels and clogs the gaps in the gravels, preventing many species from utilising them and limiting biodiversity.

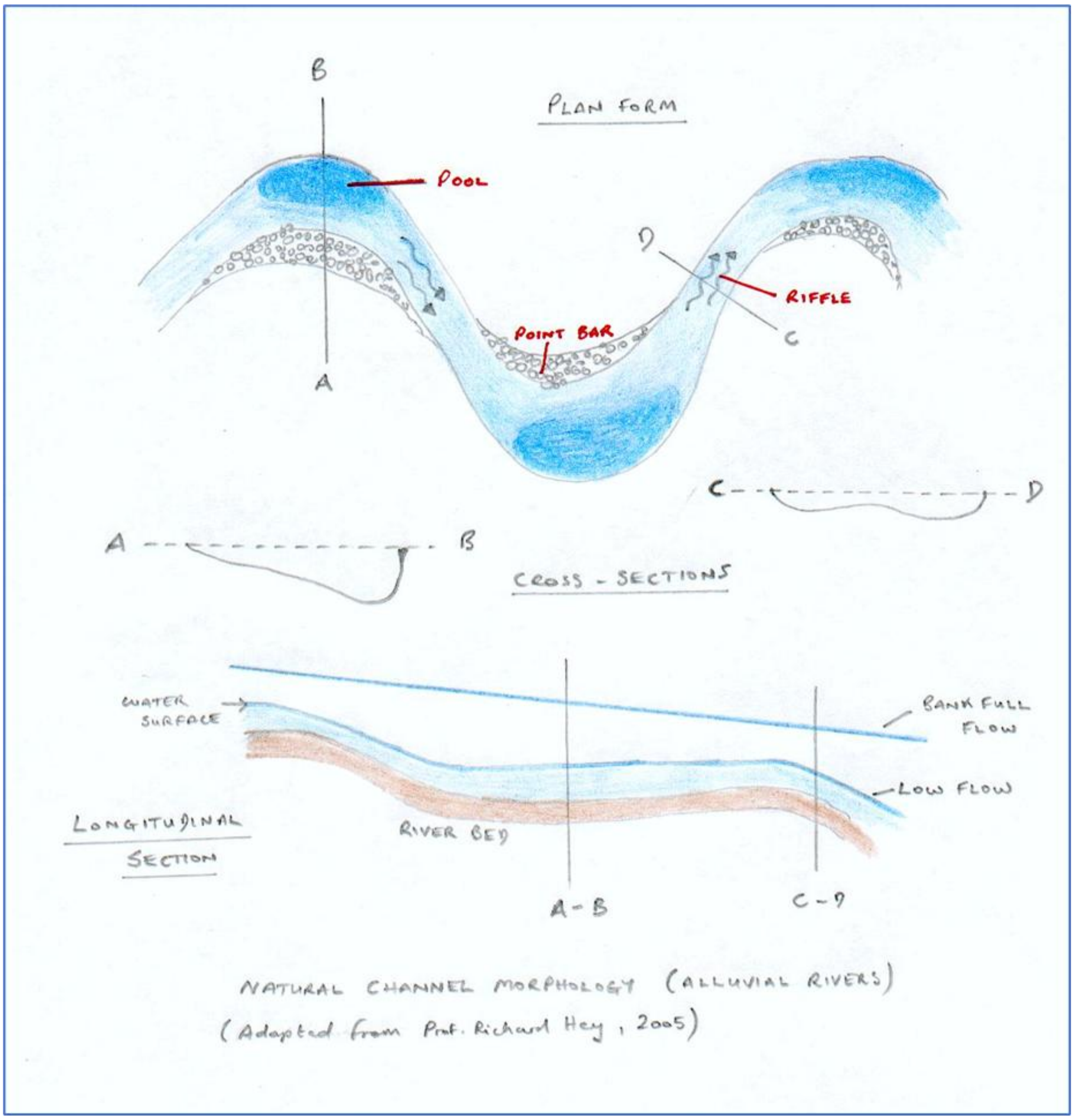


Figure 1 Infographic showing birds-eye (planform) view of a natural, meandering watercourse as it laterally erodes and deposits material in the floodplain.

Another key issue with dredging, seen throughout this upper section of the Stour, is it creates an overly deep channel, restricting floodwater from spilling onto the floodplain. In natural rivers, this overflow slows flows and reduces flood energy, protecting aquatic life and reducing in channel erosion. In dredged channels, floodwaters are confined, increasing velocity and stream power beyond what fish and invertebrates can tolerate. When water finally overtops the high banks, it often then drains too quickly, leaving aquatic animals stranded on the floodplain and rushing water downstream to create flood issues elsewhere in the catchment. As levels drop and flow rates reduce, dredged channels enter the phase where they then deposit and build up large amounts of silt on the riverbed.

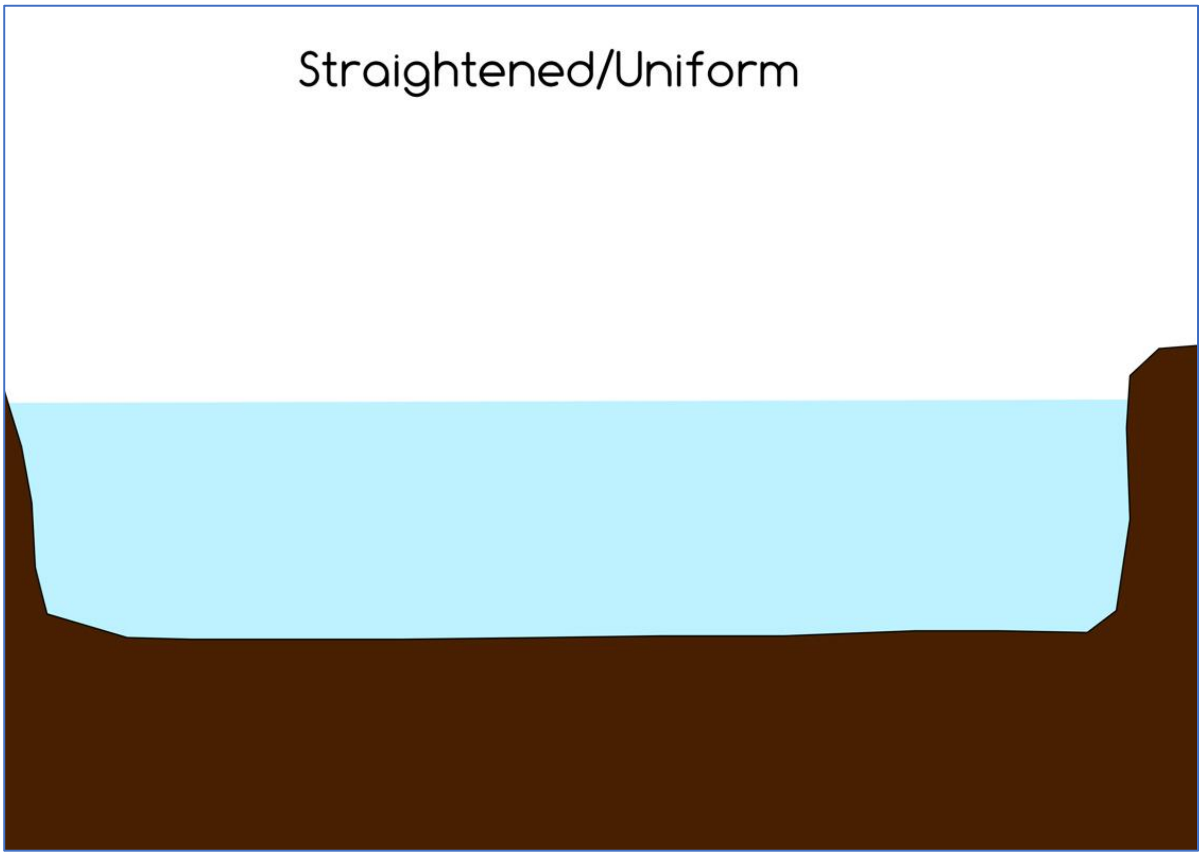


Figure 2 The featureless channel shape (often a 'U' shaped or trapezoidal channel), left behind once dredged – devoid of diversity in channel shape and does not support good aquatic biodiversity. Unfortunately, once heavy dredging has occurred and overly deepened a watercourse, it can be very difficult or unfeasible to restore the channel.

The visit occurred during a period of low flow and the water in the channel was displaying slow to no flow throughout the section upstream of the Mill, likely through a combination of altered channel gradient and lowered riverbed from the dredging and impoundment (water being held back) from a structure downstream. The watercourse also passes into some bankside woodland in this upstream section. Interaction with large woody material from bankside trees is hugely beneficial for watercourses, for several reasons. The larger pieces of wood that were seen lodged in the channel were collecting leaf litter and debris and pinching the channel a small amount to create a little diversity in flow. For macroinvertebrates at least, this will be providing some variety in foraging and physical habitat opportunities, helping to support some species diversity as a result. A large adult caddisfly was seen on the day of the visit in this upper section.

Photo 2 (52.025889 , -1.5393557) Several large pieces of wood were lodged in the channel from the surrounding woodland at the top of the reach…

Photo 3 This continued into the first significant bend. One option for the whole of this reach upstream of the mill would be to utilise the material available in the adjacent wood to build some very large 'leaky dam' structures as a natural flood management measure. These would help slow the flow down during floods, back

the water up and force it out onto the floodplain to help temporarily store it. Increased rates of flow will scour underneath structure to help diversify the riverbed and physical habitat available for aquatic wildlife.

A disused mill race is also present (seen in the topographical LiDAR map in Figure 3) which may provide opportunities for further wetland creation that has flood water management benefits, too.

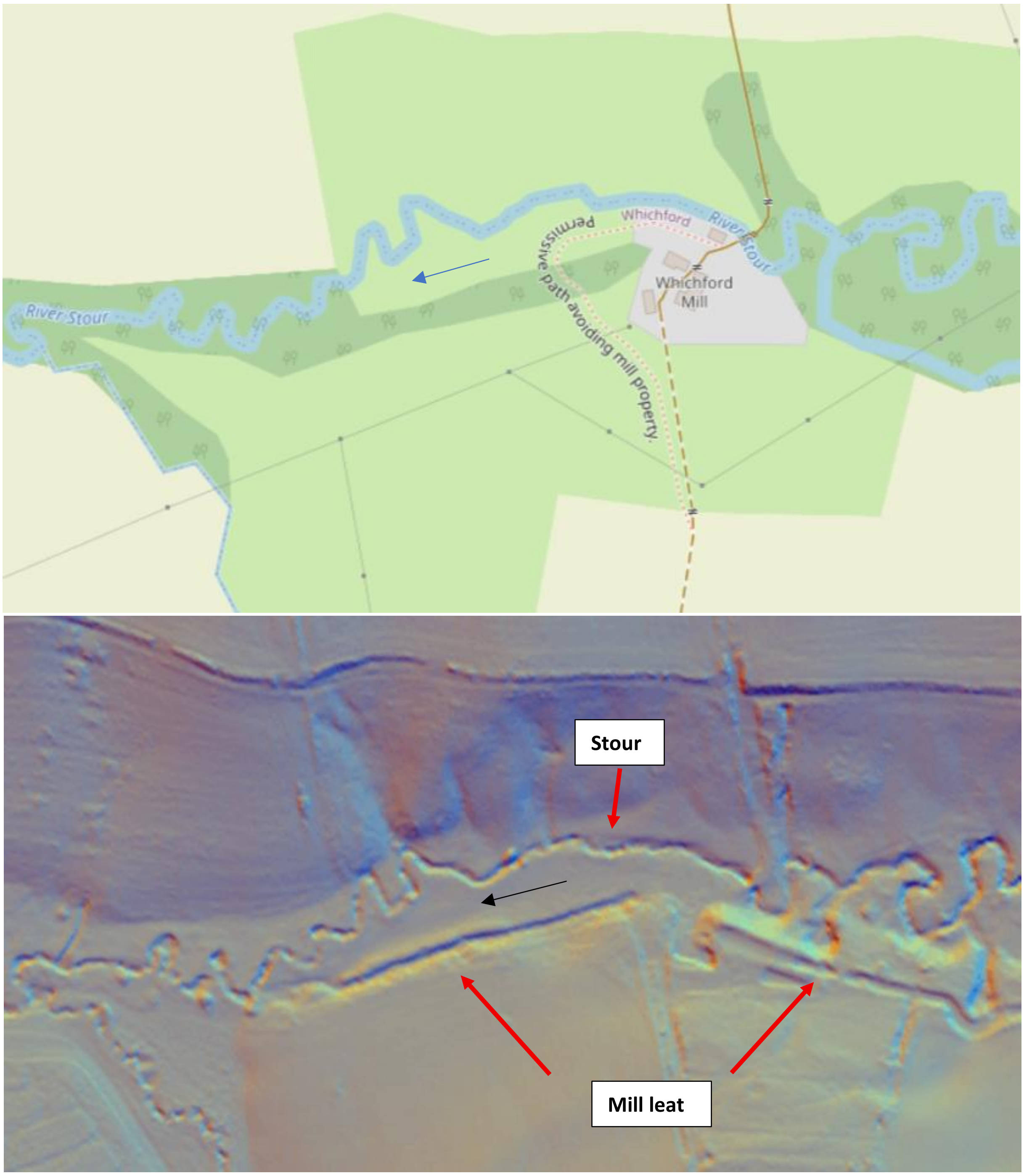


Figure 3 Overview map (top) and topographic LiDAR map (bottom) showing the location of the redundant mill leat. Depending on the maps used, this mill leat continues downstream of Whichford Mill to rejoin the Stour as the Mill Stream.

Moving downstream into the area of the Whichford Mill access track and buildings, the watercourse starts to change a little. After a small river dipping pool used by visitors to the site, a small riffle has formed, and the pace of flow increases as a result. The riffle was reported to have moved downstream in the last couple of years by a few metres, this is a good thing, exactly what the river should be doing, through transportation and deposition of bed material in response to flow!

The gravels in the riverbed were reasonable here, but quite a bit of fine silt was seen to be settled within them. This will be an issue created by the volume of fine sediment entering the watercourse coupled with the impounding effect of the block structure that has been created under the access bridge to try and retain water levels upstream (Photo 5).

Photo 4 The bottom of the end of the dipping pool as it lifts into a shallower, faster flowing riffle around the bend, to the right of this photo (red arrow).

Photo 5 (52.025915 , -1.5400128) Concrete blocks have been placed across the downstream end of the access bridge arch, to hold water back (red arrow). This will be severing access for fish up and downstream and negatively altering the habitat upstream by un-naturally impounding water. If removed, the riverbed level is likely to move in the meander upstream as it re-adjusts, back up to the dipping pool. Once the riverbed 'settles' following removal of the structure, water levels can be manipulated if required for a dipping area, perhaps by using very large woody material structures, to create beneficial habitat at the same time.

Downstream of the bridge, some slightly better-quality habitats were seen developing in the channel due to energised flow and increased velocities. Although heavily incised still, there was a 40m-50m section of watercourse where minor erosion and deposition of gravel material was creating diverse areas of flow and depth. Equally, the gravels were being cleaned of fine silt due to the energised flows, opening the gaps between individual gravels and stones as required by many fish and invertebrate species.

It would be worth considering re-grading the riverbanks back to alleviate some of the issues with the deeply incised channel here. However, consideration would need to be given to the large volume of spoil that would be generated from this; where it would go and how it would be moved. Also, timings of work would need to be a major consideration, to avoid bare earth being left exposed to floods, especially through the autumn and winter.

Photo 6 Downstream of the bridge. Note the higher velocity flow and resulting clean patch of gravel.

Photo 7 (52.025998 , -1.5401791) Undercut banks, roots trailing in the water and boughs leaning over (and eventually into!) the watercourse are all highly beneficial habitat features providing opportunities for invertebrates and fish. There is a minor example of a meander trying to form here (as per Figure 1), with gravel deposition on the inside of the bend and erosion into the bank on the outside of the bend (red arrow highlights the gravel deposition).

Photo 8 Another example of better-quality stream habitat trying to form. The over-hanging and trailing vegetation flanking this shallow glide and flowing over

a gravel bottom provides plenty of opportunities for aquatic biodiversity here. Some filamentous algae, potentially an indicator of elevated levels of nitrate and phosphate in the water, is present. The volume of growth isn't smothering the gravel currently - but has potential to – something to keep an eye on.

Photo 9 (52.026062 , -1.5404420) The thick overhanging vegetation, coupled with the increase in depth and steady pace of flow, makes this an attractive spot for many fish species that could be present. Slower growing native shrubs and trees, such as the hawthorn on the RHB, provides the very beneficial overhead cover for stream wildlife. Faster growing willow is good in places, but can dominate, and create too much shade to the watercourse – as seen in Photo 15.

Photo 10 (52.026087 , -1.5405788) A concrete bed-check has been introduced at some point. The river has responded positively to this pinching of the channel where it has broken through, ensuring flow is energised and beneficial areas of flow diversity are generated. However, it would be beneficial to remove this and replace the artificial concrete with natural large woody material, and use locally sourced larger rocks for the riffle feature in the middle of the channel (ensuring fish passage is maintained). The height of the bank has left the section immediately downstream barren of habitat features such as trailing vegetation or woody material. There are opportunities to introduce some woody material here to mitigate this.

Photo 11 Highlighting the level of channel incision in the reach downstream of the mill. Regrading (pulling back) the bank, even if just on the inside of where meanders are trying to form, would be beneficial and kick start additional river process. A large volume of material will be generated form this activity that will need to be removed form the floodplain.

Photo 12 (52.026072 , -1.5411286) Another concrete bed check. This one is more severe with potential to impact fish migration and alter habitat upstream by artificially holding bed material back and encouraging deposition of silt. This should be removed and opportunities reviewed for introducing large woody deflectors, if appropriate. The pool habitat immediately downstream of this feature is providing additional channel variation, however the face of the RHB is bare, limiting the habitat value here. Pinning some large and brashy material here (or hinging a tree over into this location if there is one suitably adjacent) will moderate rates of bank erosion and provide some excellent habitats for fish and invertebrates.

Further downstream along the reach below Whichford Mill, the floodplain widens out, providing greater space for the watercourse between the steep valley sides. However, the channel remains very incised from historic dredging all the way down to where the assessment ended, meaning the Stour is very disconnected from interacting with the floodplain. Despite the heavy modification of the channel, some river habitat features were starting to form, and there were extensive areas where gravel had been deposited. This could provide the template for a better-quality aquatic ecosystem if some habitat enhancement actions are taken to promote healthy river processes, as the gravel was seen to be very impacted by silt at the time of the visit (Photo 13 to Photo 18). At the very bottom of the reach inspected, vegetation and large woody material was starting to interact strongly with the channel, creating some benefits, along with some issues, discussed in the captions below Photo 19 to Photo 23.

Photo 13 (52.026107 , -1.5412547) A board has been pinned across the channel, for reasons that weren't apparent. The way it has been installed, perpendicular to the channel, is impounding flows upstream and causing fine sediment to deposit across the riverbed downstream. Removing this and replacing it with some large woody material to pinch the channel (perhaps even in a series of woody features), will energise flows and create areas of faster and slower velocity will let habitat develop naturally and opportunities for a diverse ecosystem.

Photo 14 (52.026010 , -1.5422820) Highlighting the level of channel incision and the floodplain area as the valley floor opens out.

Photo 15 A classic issue for tributaries of the Warwickshire Avon that have been over deepened. Willow (generally crack willow) takes over, dominating the channel (red arrow). The degraded channel is then subjected to heavy shading

within a dark tunnel of tree growth, supressing any other vegetation, and leaving a barren habitat that supports very little aquatic biodiversity.

Photo 16 Gravel deposits seen throughout the reach downstream of the Mill. This is very positive and indicative of channel recovery following dredging.

Photo 17 However, a high volume of fine sediment was found within the gravel deposits, limiting their value and potential for use by gravel dependent species that form diverse aquatic ecosystems.

Photo 18 The piece of wood encroaching into the channel over a bed of gravel creates a very positive feature. It will pinch flows in the channel, increasing velocities (especially during floods) that will then clean gravels of fine silt or sort gravels by size as they deposit, allowing for various aquatic species to select areas by their needs. Although, this piece of wood is not particularly large, so limits the magnitude of influence it has on the gravel. Introducing more or larger pieces of woody material will amplify the effects of cleaning and sorting.

Photo 19 (52.025947 , -1.5425448) The willow growth along the LHB is providing excellent overhead 'cover' and a degree of marginal habitat structure along the channel edge. Given the fast-growing nature of willow, this material could be hinged over (pleached) and pinned along the toe of the bank. This will provide excellent habitat structure for fish and invertebrates, plus refuge from increased rates of flow when water levels rise. The increased light levels will allow the willow to regenerate and other plant species to come through, improving biodiversity.

Photo 20 Further downstream, brambles and shrubs have grown thickly over the channel, leaving habitat featureless and over shaded. The density of growth could also lead to blockages upstream as woody material and leaf matter gets trapped against the tangle of over-hanging vegetation. In naturally functioning rivers that haven't been modified, this is not a problem as the river will self-regulate a response to benefit the ecosystem. Here the blockage will simply hold water back, reduce/eliminate pace of flow and degrade any stream habitat available upstream. It could also solidify build-up and lead to disconnecting the watercourse for fish passage up and downstream, as seen with the blocks under the bridge in Photo 5. Some management of the competitive and rank vegetation to reduce the shading and blockages, and reallocation of any woody material for use in and along the channel, will improve the opportunities for biodiversity here.

Photo 21 (52.025930 , -1.5427809) An example of what can happen when some light is allowed to reach the channel; a patch of water mint proliferates and will be providing additional habitat structure for aquatic species (and foraging for insect pollinators). Note the bramble creating a 'mat' of vegetation overshading and blocking the channel downstream, likely to accumulate a blockage (red arrow).

Photo 22 The large woody material covering the channel here provides excellent complex habitat structure. The spaces between the large boughs provide a

relatively unimpeded flow pathway at lower flows and helps self-maintain an open gap here, while fine leaf and branch material has accumulated to one side, providing resources for a range of invertebrates. The larger boughs being lodged above the low flow channel will come in to play as river levels rise, to slow flows for ecosystem and flood water management benefits.

Photo 23 (52.025559 , -1.5432583) Near the downstream limit of the section visited on the day. The channel here is a little over shaded, but the growth of slower growing, high-canopied hazel coppice is an excellent form of bankside growth for shading the river and keeping it cool from intense sunshine and heat in the summer months. The large bough and branches covering the channel here are creating a very beneficial habitat for fish and invertebrates and will help slow rates of flow down when river levels rise, so providing refugia for stream species, too. It would be worth reviewing these sections to see if further enhancements can be made by introducing woody material along marginal areas to push low flows around and help maintain fine silt transport through this section. Coppicing some of the hazel on a cycle across several years may produce useable materials for this work and gently increase light levels to the channel as coppice stands mature.

Photo 24 Opportunities to benefit the watercourse and its wildlife exist when looking into the surrounding landscape, too. Three large ditches run off the slope in the field opposite Whichford Mill, around 52.026272 , -1.5421318. Natural flood management interventions to slow the flows coming out of these springs, once the landscape becomes saturated, will help contribute to moderating the extremes of high and low flows in the river channel. If land drains exist, it may be possible to smash these out, back away from the river to allow the valley floor to wet up and hold water, rather than it flowing straight into the river from the drains.

4. Recommendations

- Consider utilising the upper reach for a natural flood management project, increasing connectivity between the channel and the narrow floodplain, especially by using very large woody material to form 'leaky dams' which also creates habitat for river wildlife.

- Investigate potential for regrading banks in key locations and where could the spoil go to (Figure 4). Appropriate licences will be required for this (seek advice). Alternatively, look for opportunities to raise the bed of the river to restore natural connectedness between stream levels and the floodplain below the Mill. A good explanation of this technique is available in this Advisory Visit report: West-Glen-2022.pdf

- Remove the concrete blocks from under the access bridge to Whichford Mill. Review the response of the river upstream of this, install large woody material to maintain dipping pool levels and generate a riffle downstream in the bend, benefiting both visitors to the Mill and wildlife.

- Downstream of the mill, remove concrete bed checks and kicker boards, develop a plan to replace with large woody material features (Figure 5) to diversify flow patterns and encourage river processes of erosion and deposition. These will also help move and clean gravels, too.

- Identify where to use natural bed checks and deflectors made from pinned woody material to accumulate gravel or clean and sort gravel through the lower section of the water course below the Mill (Figure 6 and Figure 7).

- Create a vegetation management plan. Look at willow and hazel locations and plan how to cut some back on incremental cycles to maintain flows through the channel and some light to the channel where things are particularly over-grown. Plan where materials can be used, procuring both larger bits of wood and brash for use in river habitat work (Figure 8).

- Engage with catchment partners for further support on restoring and managing the river and surrounding environments. For example, Severn Rivers Trust, Warwickshire Wildlife Trust and the Wild Trout Trust can share collective knowledge on best practice and help guide access to funding or project delivery. SRT and WWT especially for considerations around natural flood management in the upper section and field with the springs.

Figure 4 Bank reprofiling in action.

Figure 5 Features installed in a dredged channel to pinch and diversify the low flow channel. This will drive river process, encouraging the river meander.

Figure 6 Gravel accumulation behind a pair of pinned logs creating diversity in flow velocities (red arrow).

Figure 7 Upstream pointing pair of large woody deflectors recharging flow energy downstream.

Figure 8 The 'brashy' crown of a tree anchored to the margins of this river to provide excellent physical habitat enhancement.

5. Further assistance

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 may be 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. pinned woody material, willow planting, willow laying, etc.). Please contact your local WTT Conservation Officer for further information.
- WTT Project Proposal
    - Where AV recipients require a more substantial restoration project developed, involving larger capital delivery and exterior funding, WTT may be able to develop recommendations from this document into outline proposals, indicative costs and designs to take forward for funding. Often this can be in collaboration with other catchment conservation partners, such as Environment Agency, Rivers Trusts and Wildlife Trusts.

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

https://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-dvdhttp://www.wildtrout.org/shop/products/rivers-working-for-wild-trout-dvd or by calling the WTT office on 02392 570985.

An important source of income which helps to fund the WTT's work is our Annual Spring Auction. The auction is our biggest fundraising event and includes fishing days, tackle, books, art and more. Many of our AV and PV recipients subsequently help us with auction lots each year, and we're very grateful for this extra support. To donate a lot, please contact Christina via office@wildtrout.org.

6. Acknowledgements

The WTT would like to thank the Environment Agency for supporting our advisory and practical visit work in England.

7. 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.

Legal permissions must be sought before commencing work on site. These are not limited to landowner permissions but will also involve regulatory authorities such as the Environment Agency, local Council – and any other relevant bodies or stakeholders. Alongside permissions, risk assessment and adhering to health and safety legislation and guidance is also an essential component of any interventions or activities in and around your fishery.