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Advisory Visit

River Perry, Shropshire

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Contents

Summary

- The river habitat quality of the River Perry in this location is severely compromised by past drainage schemes which created a deeply incised, straightened channel with uniform glide habitat.
- Schemes to address the damage to the river channel would require major interventions with six or seven figure costs.
- Low-tech interventions such as introducing large woody material (LWM) to the channel and bank reprofiling would offset some of the habitat uniformity.
- Himalayan balsam is present and Friends of the River Perry should continue to control it by hand pulling, targeting hotspots before the plant sets seed.

Introduction

This report is the output of a site visit undertaken by Tim Jacklin of the Wild Trout Trust (WTT) to the River Perry near Baschurch and Ruyton-XI-Towns, Shropshire on 15th July, 2026. Comments in this report are based on observations on the day of the site visit and discussions with the Friends of the River Perry (FORP).

Specific locations are identified using decimal latitude and longitude (e.g. 52.794627,-2.8861669), which can be pasted straight into online mapping tools 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. Reference to true right and left banks are when facing downstream and often abbreviated to TRB and TLB respectively. Upstream and downstream are abbreviated to u/s and d/s respectively.

Previous WTT advisory visit were carried out on the Perry in 2009 (Adcote – Mytton Mill), 2019 (Yeaton Peverey), and 2010 and 2024 (Whittington). The current visit was to the middle reaches of the river, around 10km upstream of the Severn confluence, between d/s of Ruyton (52.790248,-2.8832754) and Jubilee Bridge, Wykey (52.813890,-2.8972524).

Catchment Overview

The following is extracted from previous WTT reports on the Perry:

The River Perry rises in the low hills on the boundary of the North Shropshire sandstone plain and flows south to join the Severn near Shrewsbury. The underlying geology is mostly Bunter Sandstone, overlain with a complex mixture of glacial deposits and soils. In its headwaters it is a stony-bedded stream with a gradient falling from 30 to 15 metres per kilometre ($m.km^{-1}$), reducing to between 5 and 7 $m.km^{-1}$ below Gobowen where it flows through alluvial silts and clays (Harper, 1990[1]).

The Perry then enters Baggy Moor, a large depression of basin peat where the river gradient is 1 $m.km^{-1}$ or less. Much of the channel in the upper catchment of the Perry has been heavily modified to improve drainage for agriculture. Main and tributary channels have been extensively canalised; for example a

[1] **Harper, D.M. (1990)** The ecology of a lowland sandstone river: the River Perry, Shropshire *Field Studies* **7**, 451-486.

scheme in 1985-88 lowered the river bed by 1 metre between Rednal and Ruyton to increase the drainage of Baggy Moor and intensify agricultural land use.

The Perry has been the subject of studies into the effects of canalisation (land drainage) on fish populations, and the effectiveness of in-stream structures in mitigating these effects (Swales, 1982[2]; Swales & O'Hara, 1983[3]); more recent studies have been completed by Ros Challis of the Environment Agency.

After Baggy Moor and downstream of Ruyton the character of the river changes markedly. Its gradient increases to 2 $m.km^{-1}$ and it flows over boulder clay and glacial debris, the channel bed becoming predominantly stony, interspersed with large rocks and boulders. This is the only section remaining downstream of Gobowen with its natural meander patterns and pool-riffle sequences (Harper 1990).

The sections of river visited during this visit lie within the heavily modified reach, subject of the 1985-88 drainage scheme described above, just downstream of the extensively drained Baggy Moor peat basin. The reach inspected lies within a relatively narrow, steep-sided valley which contrasts with the flatter landscape of Baggy Moor upstream.

Under the Water Framework Directive (WFD), the Environment Agency assesses rivers and streams against targets for water quality, ecology and physical condition of the channel. This section of the Perry falls within waterbody ID GB109054050030. It was classified as being in overall *moderate* status in 2022 which falls short of the target status of *good* (Table 1). The reasons for not achieving good (RNAG) are cited as agricultural and land management practices. Specifically, the Perry fails for phosphate recorded in water samples and macrophytes, the plant life recorded at monitoring points. Phosphates are indicative of direct water quality issues at water treatment works or diffuse inputs from agriculture – and regularly occur

[2] **Swales, S. (1982)** Notes on the construction, installation and environmental effects of habitat improvement structures in a small lowland river in Shropshire. *Fisheries Management* **13**, 1-10.

[3] **Swales, S. & O'Hara, K. (1983)** A short-term study of the effects of a habitat improvement programme on the distribution and abundance of fish stocks in a small lowland river in Shropshire. *Fisheries Management* **14**, 135-144.

in conjunction with elevated fine sediment input to watercourses from land management practices. FORP carry out water sampling under the Angling Trust's Water Quality Monitoring Network, which includes phosphate testing.

Measures for fish and invertebrates were at *good* or *high* status. There are the ubiquitous failures for the 'forever chemicals' (PFOS and PBDE). The WFD classification depends upon the number and location of sampling points within the waterbody which is 20km long, and the frequency of sampling. Hence areas remote from sampling points and out-of-date data may not reflect local conditions (such as the inspected reaches).

River	River Perry
Waterbody Name	Perry - conf Tetchill Bk to conf R Severn
Waterbody ID	GB109054050030
Management Catchment	Perry Roden and Tern North Shropshire
River Basin District	Severn
Current Ecological Quality	Overall status of **moderate** ecological status, last assessed in 2022
U/S Grid Ref inspected	SJ 39622 24416
D/S Grid Ref inspected	SJ 40532 21775
Length of river inspected	c.2.3km

Table 1 Summary of Water Framework Directive information for the waterbody Perry – confluence of Tetchill Brook to confluence R Severn (https://environment.data.gov.uk/catchment-planning/WaterBody/GB109054050030)

Habitat Assessment

Three sections of river were inspected during the visit, as described below. The over-riding influence on river habitat quality in all reaches is the extensive past modification of the channel for agricultural drainage, which can be seen in most of the photographs below. This modification pre-dates the C19th (evidenced by historical maps, see https://maps.nls.uk), and has also occurred more recently, for example the 1980s scheme described above which lowered the riverbed by 1 metre. The results of this are:

- A deeply incised channel with steep banks.
- A disconnect between the river and its floodplain.
- The absence of a natural pool-riffle sequence.
- A uniformity of channel dimensions, water depth and flow pattern (slow glide).
- A lack of coarser bed sediment (gravels) and a predominance of fine sediment (sand, silt).

This physical uniformity tends to be reflected in a lack of biological diversity, for example:

- A very narrow riparian zone alongside the river and a disconnected floodplain due to the steep banks and incised channel. This transitional habitat between the terrestrial and aquatic should provide numerous functions, such as a low-velocity refuge area for aquatic species during floods, and seasonal/permanent wetland habitats benefitting amphibians and juvenile fish.
- Reduced spawning opportunities for riverine fish and reduced aquatic invertebrate diversity due to the lack of gravel riffle areas.

Restoring the channel/floodplain and their natural processes would involve extensive bed-raising and/or floodplain lowering and would be very challenging financially, politically and logistically. Observations and recommendations in this report are therefore made in the context of the underlying structural issues with the river channel remaining.

Upstream of Platt Bridge, Ruyton (52.795590,-2.8875402) to downstream limit, adjacent to sewage works (52.790248,-2.8832754).

Upstream of Platt Bridge, the west bank is a public open space of mown grass with a wide unmown margin alongside the river; this is beneficial for riverside habitat, providing bank stability and cover from trailing vegetation (Photo 1). Planting some native trees along this bank would increase vegetation diversity and provide increased shade for the river channel. Shading of rivers is increasingly important in the warming climate and benefits cool-water species such as trout.

The river channel is slow-flowing with a bed of fine sediment colonised with aquatic plants typical of these conditions (Photo 2). The invasive non-native plant species Himalayan balsam is present and FORP have made sterling efforts to control it by hand-pulling. Parts of the east bank of the river are within private gardens and there are some stands of balsam there; FORP are engaging with residents to control it.

Photo 1 Upstream of Platt Bridge in the public open space the river is bordered by a beneficial wide margin of vegetation. Tree planting in this area would provide some diversity and shade for the river.

Photo 2 River channel u/s Platt Bridge – uniform width and depth, steep banks, slow flow and prolific aquatic vegetation, reflecting past drainage schemes' impact on river habitat.

Downstream of Platt Bridge, the river runs through farmland (mowing grass) and has a more meandering planform than other reaches, although the channel remains deeply incised (Photo 3). There is an open aspect and just the occasional alder trees on the bank, which provide valuable shade and cover within their submerged root systems (Photo 4). This section would benefit from bank reprofiling on the inside of bends and tree planting to increase channel shading and provide material for future large woody structure within the channel. If bank reprofiling is carried out here, gravel could also be introduced to improve habitat for fish spawning and invertebrates; gravel augmentation in the absence of bank reprofiling would be liable to washout during high flows (see Appendices).

Photo 3 Downstream of Platt Bridge

Photo 4 Alder tree providing shade and cover.

Photo 5 Reprofiling the banks to a shallower angle on the inside of bends will promote the formation of gravel side bars ("beaches") and improve the riparian habitat of the river.

Downstream of Jubilee Bridge (52.813897,-2.8972417 to 52.811095,-2.9001747)

This section of river is located within the Riverside Cabins holiday park and there are various access points (decks) alongside the river on the TRB to facilitate swimming and canoeing. The river channel is deeply incised with sandstone bedrock evident at the toe of the bank (Photo 8), and a uniform slow glide flow pattern interrupted by two low, rubble weirs (Photo 7 and Photo 8).

Whilst such weirs are generally considered undesirable (www.wildtrout.org/content/weirs-culverts-and-barriers), in the context of this heavily modified channel they do at least provide some diversity. A better way of introducing diversity would be with large woody material (LWM) – the retention of fallen trees, branches, etc. which naturally coalesce into stable structures which can persist for weeks – years. These provide multiple benefits including localised scour leading to a diversity of flow pattern, depths and substrate sorting which creates various habitat niches for invertebrates, fish spawning, etc. LWM also traps leaf litter, a vital component of the aquatic food chain. The retention or introduction of LWM may conflict with the use of the river here for canoeing.

Photo 6 View d/s from Jubilee Bridge

Photo 7 One of two low rubble weirs in this section, the only features seen during the visit that interrupted the otherwise ubiquitous slow glide flow habitat.

Photo 8 The steep LHB with exposed sandstone bedrock at the toe indicates the extent of channel incision throughout the reaches inspected. Despite the steepness, it appears here that the banks have been mown, possibly to facilitate canoe access.

Photo 9 Typical view of this section – uniform channel, but well-shaded and with low-impact land uses alongside the river (compared, for example, with agriculture).

PGL site (52.809614,-2.8992185 to 52.800550,-2.8920811)

The third site visited is a short distance downstream of Riverside Cabins and is within the PGL Boreatton Park site, an outdoor activity centre for school groups. At the d/s limit of the PGL site the river continues through woodland that is used by a shoot.

The river habitat here is similar to the site upstream, being a continuation of incised channel and slow glide (Photo 10), bordered by woodland with access points for canoeing (Photo 11) and open grassy areas for other activities. The shallow bays at the canoe access points provide some contrast to the otherwise sheer-sided banks, and shoals of juvenile fish (minnows, dace, chub) were observed here. These areas provide favourable feeding habitat for young fish and refuge areas from predation and high flows.

Downstream of the PGL boundary, several natural examples of LWM were observed (Photo 12), providing some much-needed habitat variety within the channel. The lack of LWM upstream suggests it may be actively removed to facilitate canoeing.

The wooded banks provide valuable shade for keeping water temperatures down and an input of leaf litter which supports the aquatic food chain. The plentiful trees also provide opportunities for introducing large woody structures (Photo 13) to the channel by the various techniques described in the Appendices.

At the downstream extent of the reach, large stands of Himalayan balsam were discovered (Photo 14), which will be supplying seeds affecting downstream areas including the first reach inspected at Ruyton. Balsam control is most effective if tackled from upstream to downstream to reduce the supply of seeds deposited by the river.

Photo 10 Typical view along the channel, PGL site.

Photo 11 Canoe access point.

Photo 12 Beyond the d/s PGL boundary large woody material (LWM) is present in the channel, providing some valuable habitat.

Photo 13 The woodland alongside the river provides plentiful opportunities for introducing LWM.

Photo 14 Large stands of Himalayan balsam at the d/s end of the reach.

Recommendations

- Continue to control Himalayan balsam, working in a downstream direction and targeting 'hotspots' prior to flowering to minimise seed production.
- Retain fallen trees and branches within the channel wherever possible.
- In the wooded sections, introduce wood to the channel using the techniques in the Appendices.
- In the open section downstream of Ruyton, reprofile the river banks on the inside of bends to a shallow angle (Photo 15) and introduce gravel to improve fish spawning habitat (Photo 16).
- In the open section downstream of Ruyton, carry out tree planting with native species alongside the river.

Photo 15 Bank reprofiling

Photo 16 Introduced gravel

Please note, it is a legal requirement that certain works to the river require written consent from the Environment Agency prior to undertaking any works.

Making it Happen

The WTT can provide further assistance to help implement the above recommendations. This includes help in preparing a project proposal with more detailed information on design, costs and information required for obtaining consents to carry out the works.

Acknowledgement

The WTT would like to thank the Environment Agency for supporting the advisory and practical visit programme in England, through a partnership funded using rod licence income.

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 may be required before commencing work on site. These are not limited to landowner permissions but may also involve regulatory authorities such as the EA, lead local flood authority and any other relevant bodies (e.g. Natural England and Forestry Commission) 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 river.

Appendices

Tree Hinging Introduction

Hinging (also called laying, folding or pleaching) trees into a watercourse is an excellent way of adding flow diversity and roughness to a channel. Hinging replicates the natural process of trees falling into the channel, with the added benefit that the hinged section of tree should continue to grow, developing even more habitat complexity over time.

Willows are the best type of trees for hinging directly into the channel and can still thrive with up to 50% of their canopy submerged. Many other species also hinge well but should be laid into shallower areas or along the river margin, to ensure that the majority of their canopy remains in the dry.

Small, pliable species like, willow, hazel, elm, hawthorn and even alder (with a bit of practice) can easily be hinged, using hand tools such as pruning or bow saws. Trunks or limbs up to 100 – 150mm diameter can be cut by hand, in a process much like hedge laying. The more brittle species such as sycamore, ash or elder should generally be avoided as they tend to break off rather than bend.

In its simplest form, hinging involves a single quick cut through the first two-thirds of the trunk/branch, then continuing to cut a little at a time until the trunk/branch collapses down over the river or along the bank (depending upon species). The cut should be made from the exact opposite side of the tree to the desired felling direction. This is similar to conventional tree felling, however the face cut should be omitted. As a result the retained material forms the necessary hinge.

Advanced Hinging

A more advanced technique for suitably-qualified chainsaw operators to use on large or leaning trees, utilises a plunge or bore cut. This defines the extent of the hinge first, while retaining holding wood at the back side of the tree. The final fell can then be achieved by extending the plunge cut out to the back side of the tree, or with a dog tooth cut, from the back (as above). This method provides more control over the extent of the hinge, and can be safer with large or leaning trees.

When hinging larger or leaning trees, please also take the following into account:

- This is specialist work and should only be undertaken by trained, experienced personnel and proper assessment of the risks
- Large crack willows can hinge well, but may be susceptible to cracking or "barber-chairing" (collapsing and folding back on itself)
- Alders tend not to produce a strong hinge, so may not be appropriate in high energy or high flood risk areas. They can also crack suddenly, especially if badly affected by *Phytophthora* disease. However, smaller trunks can be laid effectively with practice and in appropriate places
- Poplars can be tricky too: the bark tends to crumple and ruck up (reducing their survival rate), and should only be used if nothing else is available
- Ash and sycamore are very brittle, and tend to lay very poorly as a result
- In cold weather, trees can react particularly explosively to being cut – failing more suddenly, and splitting further and in a less controlled way

Large Woody Material

Some of the most beneficial in-channel habitat structure results from fallen trees and branches, often referred to as large woody material. Where trees are present, this occurs naturally and creates features that may be stable for many years but eventually disintegrate. Naturally occurring woody material therefore relies on a dynamic supply to replenish that material.

Where lacking, wood can be installed as a habitat improvement. In its most effective form, this mimics natural fall of wood into a river, so it is often best to leave the material unsecured and allow it to find its own position in the channel (using complex pieces >1.5 times the channel width).

Lodged Woody Material

Where there are overriding flood risk considerations or other reasons for retaining wood where it is installed, lodged woody material offers a simple, quick and effective way of securing woody material, without man-made fixings. Choosing the right trunk or branch, and optimal location to install it, requires an understanding of river processes, but installation is relatively straightforward. Lodged woody material simply replicates the natural occurrence of trees and limbs lodged between or against other standing trees or stumps. The structure is secured by its own weight and the force that high flow exerts against it, pinning it even more securely to the anchor point - usually one or more vertical trees (ideally at least two). The picture below shows a simplified form of the technique for illustrative purposes, as a flow deflector that has been lodged between two vertical trunks.

Another simple method for installing lodged woody material is as a hanger, where a forked branch is hooked over a vertical trunk, with the butt end facing upstream and the canopy end downstream. Again, this completely secures the material, with no requirement for wire, rope or posts.

A hybrid of the two techniques can be used, being demonstrated below in a habitat workshop on the River Leven in north Yorkshire. Note the canopy of a sycamore tree being dragged butt end first between two bankside alders, lodging and hanging it in place to leave the bushy, diffuse canopy in the channel. Depending upon the porosity of the material used, this technique can create flow diversity, encourage sediment deposition or scour, and provide cover for fish and invertebrates.

Pinned Woody Material

This technique can be utilised where woody material is lacking in-channel, but where there are no bankside trees to act as an anchor point. Instead, the material is securely held in place with stakes. These are driven into the bed and/or bank to secure the wood, with the butt end u/s, replicating how the woody material would usually come to rest naturally.

Use of this technique is usually more suitable for lowland rivers or lower energy areas, like sheltered inside bends. In these positions, it can be incredibly effective at driving bed scour or increasing sediment deposition to reshape a uniform channel, depending upon exactly how it is used.

This is generally a deadwood technique, with the main material not usually expected to grow; it is more to kickstart river processes. However, depending upon the channel conditions, a living structure can be created by using a live willow limb or trunk. Similarly, where live willow is used for the posts, they will usually form a new tree that can be used for future habitat enhancement, often by simply hinging it down into the channel.

Above, live willow posts were used to secure a branch into a recently restored channel to assist the retention of coarse sediment during high flows. The following two pictures show a piece of live willow pinned into the channel (still healthy and growing) and large ash tree pinned into a stream, both providing much-needed cover and refuge for fish, along with flow deflection that will aid in scouring and sorting of the substrate, diversifying the otherwise uniform bed profile.

Toppling

Toppling can be a great way of introducing substantial woody material into a channel. Even in higher energy areas, the technique can be effective, but it may be more difficult to gain a permit for completely unsecured material in higher flood risk areas and some degree of burying may be required. As with any of the more natural techniques that can be applied, this technique closely mimics nature and the occurrence of windblown trees. A major benefit of this technique is that any tree with its rootball attached will be more stable within a channel, as the root plate acts as a natural anchor.

With natural treefall, the weight in the root-plate and associated friction against the bed usually causes flow to naturally drag a tree canopy round to lie downstream. The structure often then settles along a straight or inside bend, where the flow energy is least and where the structure will often lie for many years, sometimes until it degrades sufficiently and naturally disintegrates into much smaller pieces. The installation of root planted trees should follow this blueprint, installing the material to similar in-channel locations, unless there really are no concerns about the structure naturally adjusting in the channel.

The technique is usually initiated with the use of an excavator, which is used to dig out the back side of the roots (the opposite side to which the tree is intended to fall) and then push the tree over to the desired position. A similar effect can be achieved by winching a tree over, but loosening of the root-plate is still generally beneficial first. Alternatively, the entire root-plate of a tree can be exhumed and the tree transported from any location to be installed to the channel.

The structure provided within the channel can create valuable pinch-points, which increase flow diversity, focussing scour into the bed locally around the rootball and larger stems/trunk and encouraging deposition in other areas, usually among or downstream of the canopy.

Because of the sheer size and mass of the structure, it can be used to initiate large and quite rapid changes within a channel, which can be great to use where past channel modifications have left an overly straight channel or unform bed profile and significant scouring/reshaping of the bed or banks are required.

Chop and Drop

The chop and drop technique is particularly suited to treelined watercourses, where the larger the tree is the less chance there is that it will be transported away as it cannot travel far before becoming naturally lodged against another tree, stump or in-channel feature. This makes it particularly good for woodland environments and can be one of several more natural measures that can be used to create true natural flood management (NFM), without the need for the often very artificial structures used in 'NFM'.

As with many of the larger tree techniques, chop and drop can rapidly create a considerable increase in flow diversity and drive beneficial bed scour and/or deposition, depending upon how and where it is used. The technique is about as simple as it could be, it just involves felling tree over or into a watercourse. The only real trick is picking the correct location and correct tree, so that the overall tree canopy of the area is not negatively affected and the material will have the desired impact upon flow and natural processes within the channel.

In the example below the tree was felled just downstream of a bankside tree, but with sufficient length of trunk retained on the bank that it cannot be carried away downstream. An alternative option is to fell the tree to the upstream side of the tree or between multiple tree trunks, thereby creating an even more secure Large Lodged Woody Material feature (LLWM). Note how even within a few minutes of initiating the technique, a natural foam raft had accumulated on the upstream side of the structure, creating valuable in-channel cover, a source of shade, and accumulation of invertebrates for fish to eat.

Trout Habitat

Due to their need for clean, well-oxygenated water, structurally-varied habitat, and free movement between different types of habitat at different life stages, the UK's native wild brown trout makes an ideal indicator species for healthy rivers. These characteristics mean that a simple and effective assessment for overall river health can be based around the life cycle requirements of brown trout.

As a result, identifying and noting the presence or absence of habitat features that allow trout to complete their full life cycle is a very practical way to assess overall habitat quality. By identifying the gaps (i.e. where crucial habitat is lacking), it is often possible to design actions to solve those habitat bottlenecks.

To put all this into context, there are three main habitat types required for wild trout to complete each of their three key life cycle stages. This creates a demand for varied habitat, which is vital for supporting a wide diversity of other species too.

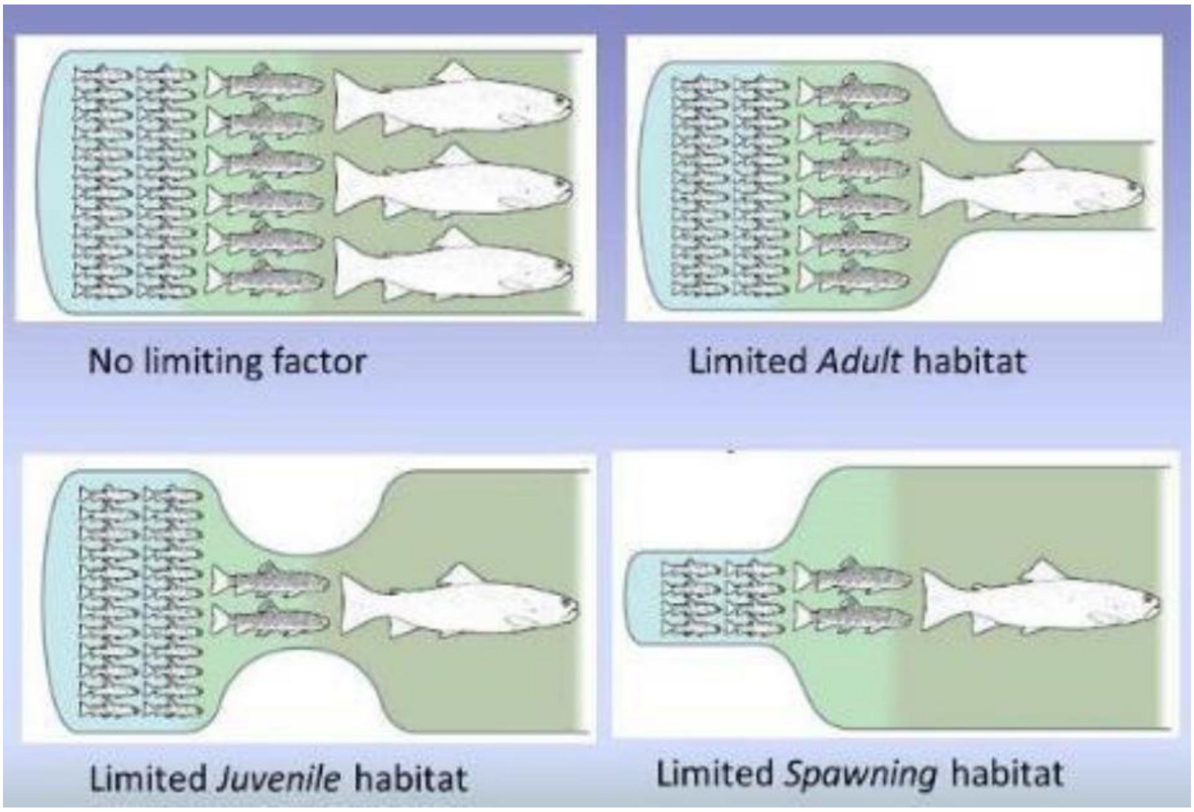

Figure 1: The impacts on trout populations lacking adequate habitat for key life cycle stages. Spawning trout require loose gravel with a good flow-through of oxygenated water. Juvenile trout need shallow water with plenty of diverse structure for protection against predators and wash-out during spates. Adult trout need deeper pools (usually > 30cm depth) with nearby structural cover such as undercut boulders, sunken trees/tree limbs and/or low overhanging cover (ideally trailing on, or at least within 30cm of, the water's surface). Excellent quality in one or two out of the three crucial habitats may not mitigate a 'weak link' in the remaining critical habitat.

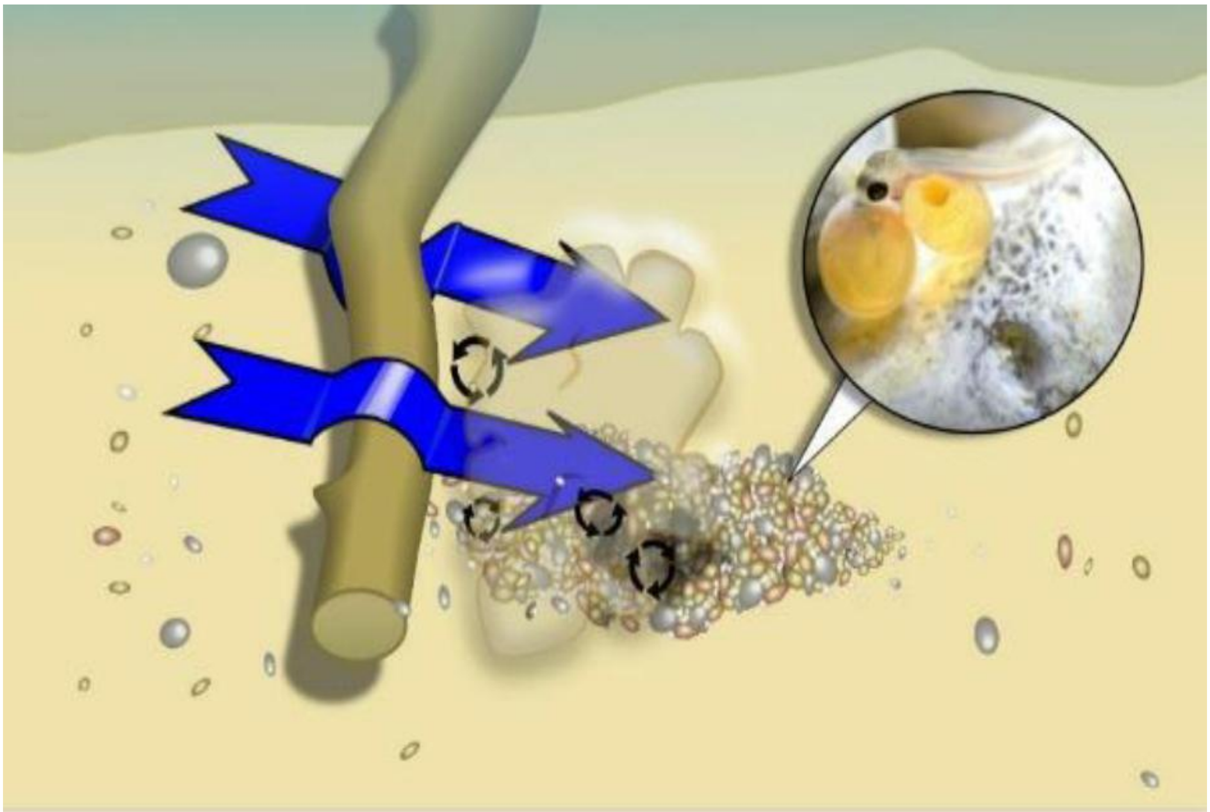

Figure 2: Successful trout spawning habitat requires relatively silt-free gravels. Here, the action of a fallen tree limb is focusing the flows (both under and over the limb as indicated by the blue arrows) on a small area of riverbed that results in silt being washed out from between gravel grains. A small mound of gravel is deposited just below the hollow scoured out by focused flows: this mound will be selected by trout to dig a 'redd' for spawning. In the silt-free gaps between the grains of gravel it is possible for sufficient oxygen-rich water to flow over the developing eggs and newly-hatched 'alevins' to keep them alive as they hide within the gravel mound (inset) until emerging in spring.

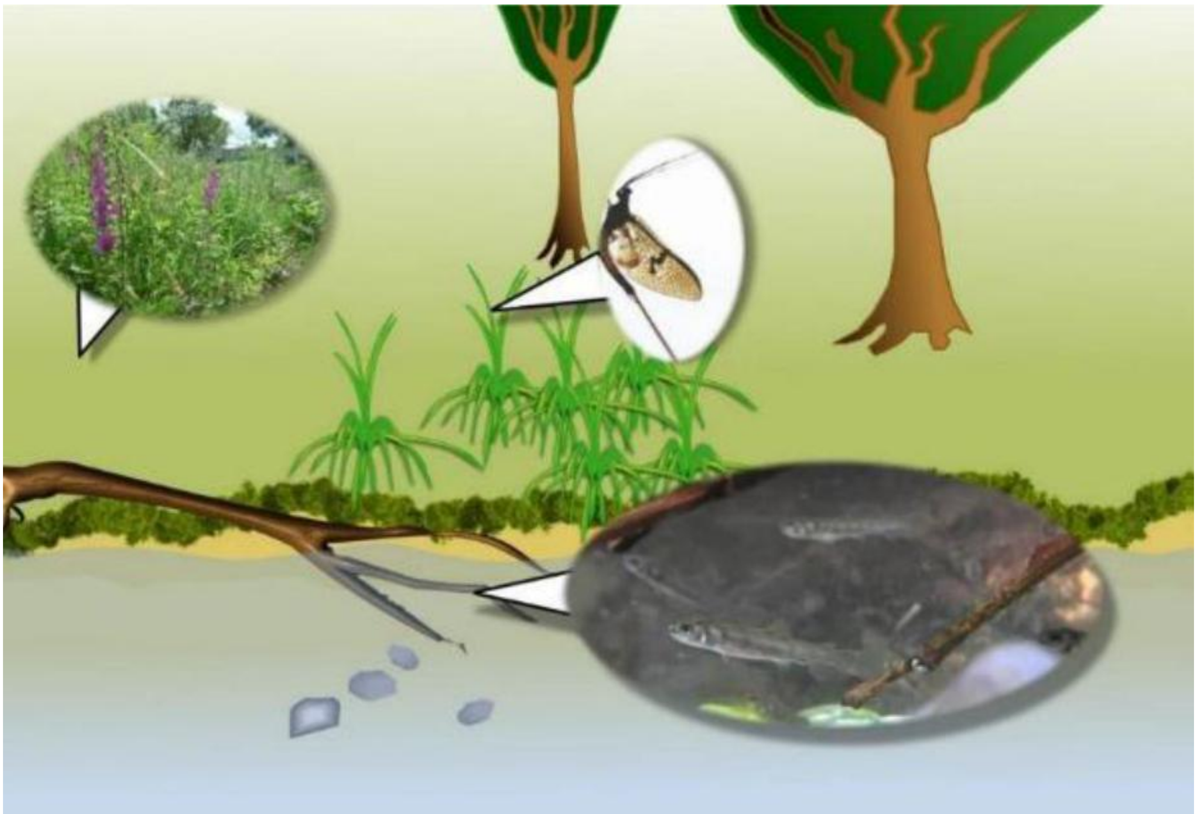

Figure 3: Larger cobbles and submerged 'brashy' cover and/or exposed fronds of tree roots provide vital cover from predation and spate flows for tiny juvenile fish in shallower water (<30cm deep). Trailing, overhanging vegetation also provides a similar function, and has many benefits for invertebrate populations (some of which will provide a ready food supply for the juvenile fish).

Figure 4: The availability of deeper water bolt holes (>30cm), low overhanging cover and/or larger submerged structures such as boulders, fallen trees, large root-wads etc. close to a good food supply (e.g. below a riffle in this case) are all strong components of adult trout habitat requirements.