Advisory Visit

River Fynn, Suffolk

May 2019

Key findings

- Much of the lower River Fynn has been degraded by historic land drainage work. The proximity of Playford Mere and land levels makes re-meandering the river unrealistic. The river could be partially restored if access for heavy plant could be found.
- Due to the river following an unnatural course, its ability to sort, transport and deposit fine sediment is limited. Consequently, the riverbed contains a high proportion of fine sediment.
- The lower reaches of the Fynn were in need of careful tree planting. Relatively quick growing species such as goat willow and hazel could be used to provide shade over pools.
- There was a general lack of large woody material within the river (due to the lack of riparian trees) which reduces in-channel habitat opportunities and the ability of the river to initiate natural geomorphic processes.
- Stands of dense vegetation should remain in places unless there is a pressing need for their removal due to flood risk. Removal of any material from the river will be degrading to its habitats.
- The reach of river near to Playford Hall was ecologically valuable. It contained a wider variety of invertebrates and supported fish, including at least one brown trout. The well-sorted gravel bed had the potential to provide spawning habitat for a range of fish species including brown trout.
- To secure a quick-win, it is recommended that simple habitat enhancement techniques (see recommendations) are deployed near Playford Hall utilising the adjacent trees and shrubs as a source of material to enhance the low-flow channel.

1.0 Introduction

This report is the output of a site visit undertaken by Rob Mungovan of the Wild Trout Trust to the River Fynn, near Playford in Suffolk, at the request of the landowner. The visit was undertaken on the 13th May 2019, accompanied by the site's manager. Comments in this report are based on observations on the day of the visit.

The purpose of the visit was to advise on the value of the river for brown trout and its potential for restoration.

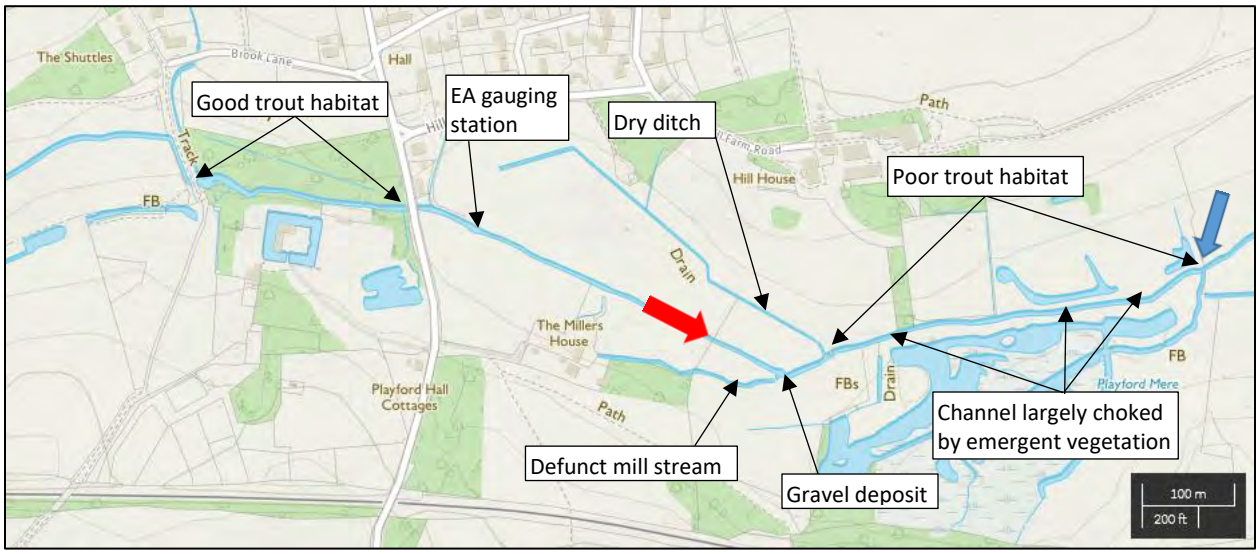
Normal convention is applied throughout the report with respect to bank identification, i.e. the banks are designated left bank (LB) or right bank (RB) whilst looking downstream.

2.0 Catchment Overview

The reach falls within the Suffolk Coast and Heaths National Character Area (NCA). It is one of the driest parts of the country, with rainfall typically only two thirds of the national average. The distinctive landscape character is a product of its underlying geology, shaped by the effects of the sea and the interactions of people. It is mainly flat or gently rolling. In many places, and especially near the coast, wildlife habitats and landscape features lie in an intimate mosaic, providing habitat diversity within a small area.

The Suffolk Coast and Heaths NCA has an underlying bedrock of late Cretaceous Chalk and overlying glacial tills (boulder clay). The boundary between the Suffolk Coast and Heaths and the more wooded boulder clay plateau of central East Anglia is incised by several small west to east river valley corridors. The rivers have fairly small catchments, with their headwaters further inland in the chalky uplands of the NCA. Due to the catchment receiving low rainfall the mean flow rates of the rivers are small.

Map 1 – The location of the River Fynn at Playford. Red arrow is upper limit, blue arrow is downstream limit of visit. Orange arrow is area of quick inspection. © Ordnance Survey.



Map 2 – Local features of the River Fynn at Playford. Red arrow is upper limit, blue arrow is downstream limit of visit. © Ordnance Survey.

	Waterbody Details
River	River Fynn
WFD Waterbody Name	River Fynn
Waterbody ID	GB105035040330
Management Catchment	Suffolk East
River Basin District	Anglian
Current Ecological Quality	Overall classification of Moderate for 2016
U/S Grid Ref Inspected	TM 21831 47559
D/S Grid Ref Inspected	TM 22367 47662
Length of River Inspected	560m

Table 1 Data from https://environment.data.gov.uk/catchment-planning/WaterBody/GB105035040330

Table 2 (over page) summarises the Water Framework Directive (WFD) data for the River Fynn. The Fynn is classified as 'moderate' ecological status overall. Parameters that make up the classification include 'moderate' for fish, 'high' for invertebrates and 'poor' for phosphates. Interestingly, the river is classed as "supports good" for its morphology, yet the reach visited had clearly been subject to very extensive past land drainage improvements and realignment (refer to Habitat Assessment). As was discovered from a brief visit of an upstream location, the reach of the Fynn that was inspected is possibly not typical of the majority of the river.

Cycle 2 classifications

Download as CSV

Classification Item	2013	2014	2015	2016
Overall Water Body	Moderate	Moderate	Moderate	Moderate
Ecological	Moderate	Moderate	Moderate	Moderate
Biological quality elements	Moderate	Moderate	Moderate	Moderate
Macrophytes and Phytobenthos Combined	-	-	-	Moderate
Fish	Moderate	Moderate	Moderate	Moderate
Invertebrates	Good	Good	High	High
Hydromorphological Supporting Elements	Supports Good	Supports Good	Supports Good	Supports Good
Hydrological Regime	Supports Good	Does Not Support Good	Does Not Support Good	Supports Good
Morphology	Supports Good	Supports Good	Supports Good	Supports Good
Physico-chemical quality elements	-	-	Moderate	Moderate
Ammonia (Phys-Chem)	-	-	High	High
Dissolved oxygen	-	-	Moderate	Moderate
pH	-	-	High	High
Phosphate	-	-	Poor	Poor
Temperature	-	-	High	High
Specific pollutants	High	High	-	-
Chemical	Good	Good	Good	Good

Table 2 - Data from https://environment.data.gov.uk/catchment-planning/WaterBody/GB105035040330

Further information listed from the above website details "Reasons for Not Achieving Good" (RNAG) under the WFD. With respect to fish populations, it is interesting to note that "barriers – ecological discontinuity" is listed. The reach inspected did not contain any barriers (again suggesting that it was not typical of the river). However, it was noted that before Playford Hall was reached, an Environment Agency gauging station was present on river (but not visited due to lack of landowner permission).

Further RNAG were listed as:

- Poor soil management
- Livestock
- Trade/industry discharge

There are clearly pressures facing the river relating to its wider catchment that were not encountered during the visit.

This section of the Fynn is not controlled by an angling club and is not fished. However, it is known that historically there was an active angling club, the Fynn and Lark Fly Fishing Club (who were recipients of an WTT Advisory Visit https://www.wildtrout.org/assets/reports/Finn_2010.pdf). The club had water downstream of the reach visited. The current status of the club is unknown.

Otters are known to be widespread in the region, and their presence was not surprising, with spraints observed during the visit. Otters and their habitat receive full legal protection under the Wildlife and Countryside Act, 1981. No signs of water voles were observed during the visit.

3.0 Habitat Assessment

The visit started at the downstream end of the reach alongside Playford Mere. The Fynn was little more than 3m wide for most of its length with incised banks. The river had clearly been subject to extensive dredging and realignment in the past, resulting in a straightened channel with no visible coarse sediment deposits, consequently there was a complete absence of riverine features such as riffles, glides and gravel bars (pic 1).

Pic 1 – The River Fynn showing an impoverished channel.

Moving upstream along a mown footpath and bank of ~20m width separating the river from the mere on its RB, there continued to be a general lack of trees especially on the LB. The mere provided a shallow open water habitat, complementing the river (pic 2).

Land use on the river's LB was rough grazing and the land rose up from the floodplain (pic 3).

The river was choked with branched bur reed. In places the bur reed was dense enough to hold the weight of a person (pic 4). This was an interesting observation, as the bur reed had clearly been in place for many years and was acting as a trap of fine sediment which had consolidated, almost mimicking the way in which riffles would form. After the stand of bur reed, the channel deepened to provide a pseudo pool habitat. The presence of dense stands of bur reed, together with consolidated fine sediment, is indicative of the current lack of dredging or desilting to this reach, and the river is seeking to restore natural features (riffles) in the absence of a supply of coarse sediment.

Pic 2 – Playford Mere which is located within ~20m of the River Fynn.

Pic 3 – The land use of the left bank was rough grazing.

Pic 4 – Bur reed had consolidated fine sediment almost mimicking the form of a riffle.

However, flow was pushing through the bur reed where the river had energy and it had maintained a small pathway of ~0.75m width through the reed (pic 5). The presence of a sinuous channel through the reed was encouraging as it showed the river's intention to re-meander across its floodplain. But any extensive meandering is very unlikely given the lack of gradient, low-flow and non-eroding margins. Furthermore, the close proximity of the mere, together with land rising on the left bank, significantly restricts the potential for realignment of the river to restore a more natural channel planform. Sadly, the river appears to be caught in a "geological straight jacket".

If access were possible for excavators and dumpers, it would be very interesting to introduce coarse sediment to the sites of consolidated bur reed and to allow the river to redistribute the material according to flow dynamics.

Pic 5 – The river was able to cut a sinuous path through the branched bur reed.

Numerous small fish were seen in the deeper "pool" habitats. Most were believed to be a stickleback species. There were also many mussels present, with many considered to be alive amongst the extensive silt that covered the bed (pic 6). Dense silt upon the riverbed is generally undesirable as it smothers aquatic habitats, limiting the available niches for invertebrates, resulting in an impoverished aquatic community. This results in less prey (food) items for fish.

Pic 6 – The riverbed was covered in fine sediment.

Continuing upstream, the riparian trees became slightly more numerous (pic 7) and greater in size and age. It is possible that previous drainage works had sought to retain trees near to property.

Trees alongside rivers are hugely important for the following reasons:

- The shade that trees provide is important for cooling water, an increasingly important issue in the face of climate change with summer temperatures expected to rise.
- Trees act as a source of invertebrate input to a river as they fall and provide food for fish, especially trout when present.
- Trees drop woody material into rivers. Leaves, twigs and branches all provide organic matter to a river. That matter maybe eaten by invertebrates initiating diverse food chains and nutrient transfer. Additionally, the surface area of the material can provide a habitat in itself for algae, fungi and microbes to establish, initiating more food chains.
- Large woody material (LWM), such as tree stems and larger branches, may occasionally fall and enter a river. LWM may change flow patterns resulting in bed or bank scour and improved habitat diversity.
- Trees can provide cover for fish, protecting them from flood flows or from predators, particularly when branches extend beneath the water.

Pic 7 – Riparian willow providing cover and shade to the river.

Towards the upper reach of the visit a number of very dense stands of reedmace were noted. They had grown to dominate the channel and diffused the river's flow, with water unable to define a clear pathway through. In places the channel was very overgrown (pic 8). Algae and organic matter was building-up against the reedmace, reinforcing the appearance of the degraded channel.

Pic 8 – Reedmace dominated the channel in places.

A dry tributary ditch (presumably once a small stream) entered the Fynn just above a sleeper bridge (pic 9). The ditch had no restoration potential.

Pic 9 – A small tributary ditch met the Fynn.

Above the bridge the river's form subtly, but importantly, changed. The channel was more sinuous and the bed profile was more variable. Adjacent to a mature common alder tree, a deep pool was present (pic 10). This part of the river did not appear to have been subject to the extensive dredging and realignment evident on the lower river.

Even more encouraging was the occurrence of coarse bed sediment in the form of a shallow gravel bar following a pool. The shallow water habitat was being utilised by a small shoal of dace. Disturbance of the riverbed by foot revealed the gravel to be quite extensive, but poorly sorted and containing a high proportion of sand.

The alder tree provided important overhead cover to the pool. The tree had clearly been present for many decades and its extensive root network provided good underwater cover for various fish species and invertebrates.

Pic 10 – The river exhibited features such as meanders, bed variation and deeper pool habitats. A gravel bar was present (inset) a short distance upstream of a mature alder.

Within the floodplain there was a redundant channel that once formed a mill stream (pic 11). The channel was no longer connected to the river and did not hold water. Investigation of the channel's bed did not reveal any gravel deposits. Restoration of the river to the redundant channel is not considered to be worthy at present due to its poor channel form, multiple landownership and flood risk to the mill house.

The habitat of the lower River Fynn for brown trout was poor. It would take a great deal of effort and material to bring about lasting restoration to the over-deep channel (but that is not to say that it can't be done).

At present the situation of allowing natural processes to reign is considered the best approach. It was reported that at times the river does experience spate flows and that is when sediment will be redistributed, and pathways scoured through emergent vegetation. Where flood risk to property is of no consequence then there is little justification to use machinery to remove any in-channel vegetation or sediment. Removal of any material will be damaging to the river and its ecology.

Pic 11 – The course of the redundant channel leading from the former mill.

It was a pleasing contrast to be taken a short distance upstream to land within the same ownership at the nearby Playford Hall. The river at that point was a complete contrast to the focus of the advisory visit. The channel contained a shallow gravel bed (pic 12), consisting of a range of well-sorted particle sizes from large cobbles to grit. The river had a pool and riffle sequence along with accumulations of LWM (pic 13). Accumulated LWM provides habitat for invertebrates which in turn provide food for fish.

Inspection of large stones revealed an immature eel (of ~20cm), live freshwater mussels, cased and uncased caddis larvae (pic 14).

Pic 12 – The River Fynn near Playford Hall: a gravel-rich stream making a pleasant contrast to downstream habitat. Inset photo shows the well-sorted gravel mid-channel ranging to fine sediment and marginal vegetation.

Pic 13 – Coarse woody material was present and provided cover for invertebrates, in addition to aiding sediment transport and marginal deposition.

Pic 14 – Coarse substrates provided surfaces for invertebrates to utilise. The photo shows many cased caddis, but stone-clinging mayflies were also present. The occurrence of these invertebrates downstream would have been significantly restricted by poor habitat. (The stones also harboured small fish like eels and bullhead.)

With respect to brown trout habitat, the occurrence of a semi-natural river with deposits of well-sorted gravel together with depth variation and accumulations of LWM, has the potential to provide for the life cycle of the brown trout (illustration 1). This short but ecologically diverse reach of river is where habitat enhancement and restoration should be initiated. Simple techniques (see recommendations) could be deployed and would give immediate benefits, thus enthusing those involved to carry on and consider plans for more challenging reaches.

Most encouraging of the entire visit was to observe a brown trout rising in a large pool (pic 15). The pool had flow variation, tree cover, depth cover, an exposed gravel bar and a shallow gravel riffle as water exited it. The only drawback was that the pool appeared to have been created by a culvert at its head which carried a track above. In flood periods the water's energy is focussed through the culvert maximising scour of the pool, but it is very likely a barrier to fish movement due to shallow depth (at low flows) and elevated flow velocity (at high flows). This culvert may be one of the known barriers identified by the EA in assessing the river's status under WFD.

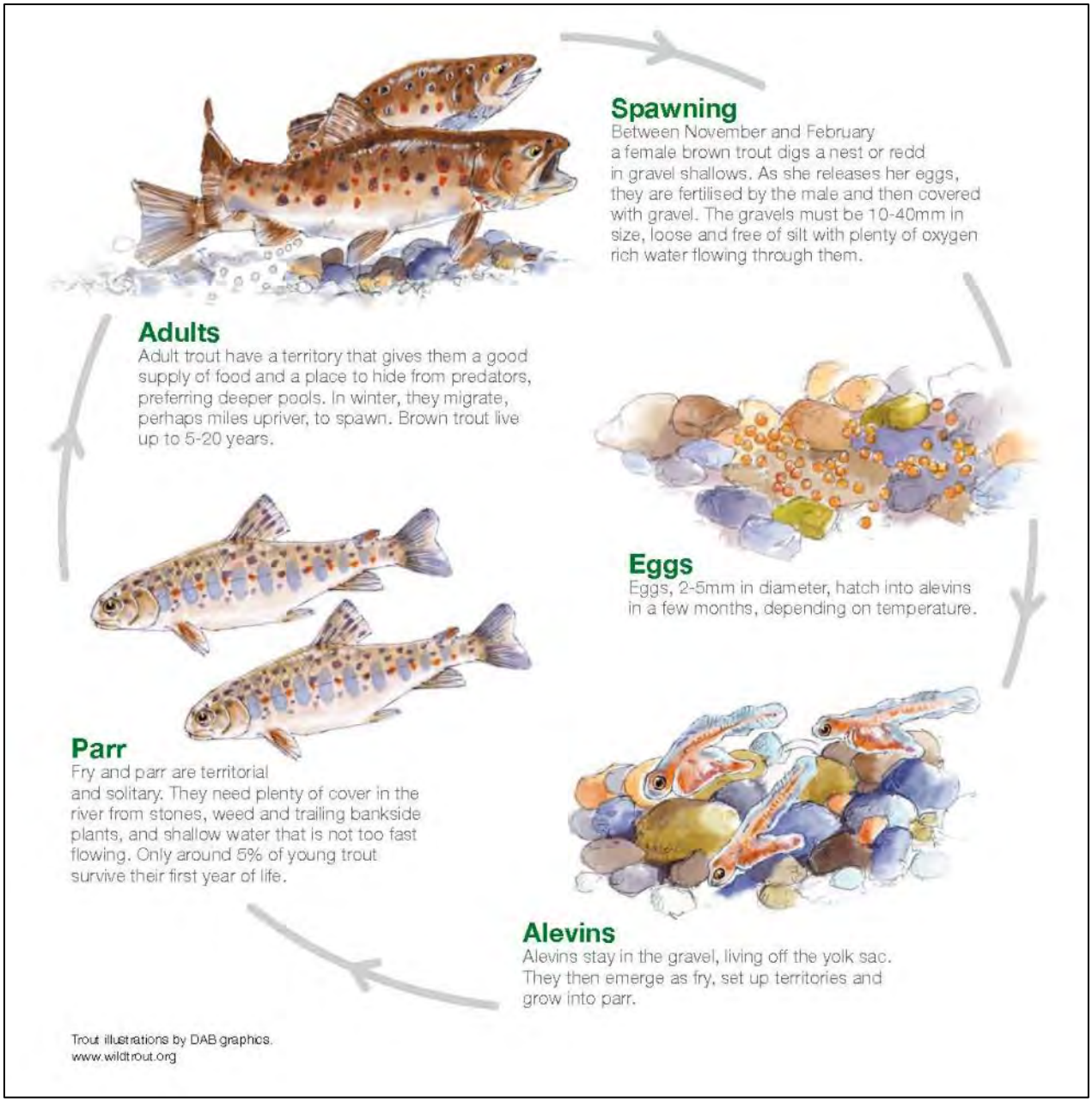


Illustration 1 – The life cycle of the brown trout.

Pic 14 – A large pool created by water flowing through a culvert (red circle). A brown trout was observed rising.

4.0 Recommendations

- The lower River Fynn would be very challenging to restore due to its over-deep bedform and restrictions of access for heavy machinery and stone delivery. Furthermore, there is little scope to re-meander the river across its floodplain due to Playford Mere and land levels. However, if access were possible for excavators and dumpers, it would be very interesting to introduce coarse sediment to the sites of consolidated bur reed, and to allow the river to redistribute the material according to flow dynamics.

- An easier win would be to undertake habitat enhancement and positive management of the existing tree stock of the gravel rich stream that was found adjacent to Playford Hall. To enhance habitat for trout, and to optimise the low-flow channel, LWM could be added to the river by the following means:

Brushwood ledges (pic 15): provide complex cover at, and below, water level. Brash from tree thinning is pinned against the bank in alternating directions of increasing stem thickness, and is securely wired down or held with battens. The brushwood lattice provides niches for invertebrates and small fish, aids silt entrainment and provides a rooting substrate for plants to establish. In time (~3yrs), the brushwood ledge will become a vegetated berm if exposed to full sunlight. Vegetated ledges can also help to address bank erosion.

Pic 15 – A low-level brushwood ledge created on the River Misbourne following tree work.

Flow deflectors: these features can be used to increase flow diversity. They can be simple log deflectors or tethered tree stems. The complex flow they create results in bed scour, depth cover, sediment sorting and sediment transport.

Pic 16 - Flow deflectors used to focus flow and scour to the centre channel of the River Welland.

Fixing LWM to the riverbed (pic 17): this is a means of increasing flow diversity and in-channel cover. In gravel-rich rivers such as the upper Fynn, the positioning of LWM mid-channel is likely to increase scour, thus aiding the development of deeper pools, new riffles and gravel bars. This diversifies the channel with complex flow patterns and greater habitat diversity.

Pic 17 - LWM pinned to the bed of the River Nadder to increase habitat diversity.

- Tree-hinging would be a simple first approach to managing the tree stock whilst providing cover at water level (pic 18). Trees (large or small) are cut to produce an effect similar to hedge laying. Species such as willow and hazel respond particularly well. Laying retains a living hinge that secures the cut stem to the tree stump. With the tree-top laid at water level, it provides excellent over-head cover, flow deflection and, if beneath the surface, increased habitat for aquatic invertebrates and cover for fish from predators.

- The lower river should be allowed to evolve through natural processes unless it were possible to important coarse sediment (10-40mm gravel) in which case it would be worth placing the material upon, and in the general vicinity of, the consolidated stands of branched bur reed.

- Unfortunately, there does not appear to be any realistic scope for re-meander the river across its floodplain due to its deeply incised nature, proximity of the mere and land rise.

- The culvert in the upper river may present a barrier to fish movement at high and low flows. All fish species need to migrate along rivers, especially brown trout. The installation of simple baffles to the culvert will be likely to increase the culvert's passability for a range of fish species.

- The EA should be contacted to see if they are aware of the culvert presenting a barrier to fish movement, and whether there are plans to address it.

Pic 18 - Tree hinging, a simple and effective technique for increasing cover in a river

- Tree planting should be undertaken, especially on the lower reaches. Quick-growing shrubs such as goat (or sallow) willow and hazel could be planted on the banksides (not just bank top) to provide cover over pool habitats. White and crack willow could be planted as larger trees that may ultimately act as a source of LWM to the river. Longer-term planting may see the use of oak, field maple and ash (subject to ash die-back) to provide bank strength.

5.0 Making it Happen

It is a legal requirement that works to a Main River like the Fynn require written consent from the Environment Agency prior to their implementation, either in-channel or within 8 metres of the bank.

The Wild Trout Trust can provide further assistance in the following ways:

- Walking the river to river to undertake project scoping, followed by the production of a Project Proposal report.
- Assisting with the preparation and submission of an Environmental Permit, or by identifying appropriate exemptions to take forward small-scale habitat improvement works.
- Running training days to demonstrate the techniques described in this proposal.

We have 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 material, enhancing fish stocks 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.

The WTT website library has a wide range of materials in video and PDF format on habitat management and improvement:
www.wildtrout.org/content/library

6.0 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.

7.0 Disclaimer

This report is produced for guidance; no liability or responsibility for any loss or damage can be accepted by the Wild Trout Trust as a result of any other person, company or organisation acting, or refraining from acting, upon guidance made in this report. Accordingly, 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 comments made in this report.