



Project Proposal

River Blyth

Humford, Bedlington

28th September 2015



1. Introduction

This report is the output of a site visit undertaken by Gareth Pedley of the Wild Trout Trust to the River Blyth in Bedlington, Northumberland. The visit was a follow up to a previous walkover to evaluate the site for potential actions that could be undertaken during a practical workshop. This report will highlight specific action that can be undertaken to improve in-channel habitat and will provide supporting documentation for a Flood Defence Consent application.

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. For convenience, upstream and downstream are often abbreviated to u/s and d/s. Locations are identified using the National Grid Reference system.

2. Background and rationale

As described in the previous report ([River Blyth – Hartford Bridge to Tidal Limit, on the WTT website](#)), the river section between Humford Weir and Humford Stepping Stones (NZ 26126 79747 - NZ 26825 80594) is relatively straight, steep gradient with a lack of in-channel structure, so high spate flows appear to wash out much of the finer sized (gravel and smaller) substrate. Some woody material is present within the channel but without any variations in channel dimensions, the material tends to get washed out, only usually accumulating in the shallower depositional areas as high flows subside (Fig. 1). Areas of bedrock and armoured/compacted substrate further reduce the potential for bed scour in many places. This leaves a relatively uniform channel that is over-wide for the low summer flows it receives and means that good holding water for fish, particularly trout and grayling, is in short supply.

Humford Dam poses another major issue in this reach, seriously interrupting fish passage and sediment transport. Plans are afoot to look into the feasibility of removing the Dam and, if removed, increased structure within the River channel would help retain some of the beneficial gravel and cobble material currently trapped u/s and greatly enhance the currently gravel starved section d/s.

The aim of this report is to highlight quick, cheap and easy actions that can be undertaken during a practical demonstration workshop to address the lack of in-channel features, introduce structure and improve the fish-holding ability of the reach.



Figure 1. Natural woody material already present in the reach accumulating around shallower depositional areas.

3. Proposed measures

The primary issues on this section of river are the uniform channel width and lack of variable bed structure and associated cover. The first proposal is to increase cover at strategic locations along the reach by hinging and laying the trunks and branches of suitable tree species (willow, hazel, elm etc.) into the margins (e.g. Fig. 2).



Figure 2. The red outline represents how the willow limb could be laid down into the river margin to enhance cover and fish holding habitat and, over time, encourage deposition and retention of substrate in that area.

The process involves cutting part way through the stem/trunk, a little at a time (like laying a hedge), until it can be forced over into the channel (Figs. 3 & 4). The depth of the cut is limited to only that which is required to bend the limb over, to retain maximum strength in the hinge. This maintains the health of the tree/shrub and ensures that it is retained in place during high flow events. On smaller shrubs, simply cutting the stem/trunk at a very shallow angle and putting an axe blade into the cut and hitting it with a hammer can be sufficient to allow laying, while retaining a good strong hinge.



Figure 3. Small hazel limbs laid into the margin of a stream to increase cover and structure.



Figure 4. A large willow laid into the channel to focus flows into the centre of the channel (blue arrow), provide cover and structure in the river margin (red circle) and encourage deposition d/s (brown circle).

An alternative method, where greater intervention is required to reinstate active river erosional and depositional features, is to deploy tree kickers. Kickers offer an excellent way to rapidly increase the level of in-channel structure and create semi-natural pinch points that focus flows (centre of channel) and closely mimic the habitat provided by fallen trees already present in the reach (Fig. 5). They can be employed to encourage gravel deposition and retention within the margins of straight, uniform width channel sections, while promoting increased scour towards the centre of the channel that will help remove fine sediment from the bed.



Figure 5. A natural fallen tree – the habitat that tree kickers closely mimic.

The installation of a tree kicker simply involves cutting a tree off at a low coppice and cabling the base of the tree to its stump with 7 x 19 wire strand core rope (rated to a minimum breaking load of 4,182 kg) (Fig. 6). Once in place and sediment accumulation occurs in and around the structure (Fig. 7), the limbs of the tree often become buried and trapped, further securing the structure in place naturally.



Figure 6. A tree kicker – a large sycamore tree that has been coppiced and cabled to its own trunk to provide structure within the river channel and facilitate deposition in the margin (see Fig. 7).



Figure 7. The d/s end of a tree kicker that has already accumulated a range of substrate sizes in its leys. This helps kick-start a natural narrowing process, retains substrate in channels where it is susceptible to high flows and introduces valuable width variation.

Both of the aforementioned techniques can be employed to closely mimic natural structures and kick-start geomorphological processes on channels that have been impacted by past maintenance. By ensuring that the structures are securely anchored naturally (laid limbs with secure living hinge), or cabled (tree kickers), any potential impact upon flood risk is prevented.

4. 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.

5. Disclaimer

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