HABITAT ADVISORY VISIT TO RODBASTON COLLEGE, STAFFORDSHIRE. UNDERTAKEN BY VAUGHAN LEWIS, WINDRUSH AEC LTD ON BEHALF OF RODBASTON COLLEGE

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Introduction

This report is the output of a site visit undertaken by Vaughan Lewis, Windrush AEC Ltd to Rodbaston College, Staffordshire on 4 February 2008. The visit was undertaken on behalf of the Wild Trout Trust. Information contained within the report was obtained from observations on the day of the site visits and discussion with Andy Taylor, Rodbaston College lecturer.

Throughout the report, normal convention is followed with respect to bank identification i.e. banks are designated Left Bank (LB) or Right Bank (RB) whilst looking downstream.

1.0 Habitat assessment

A short section of the Otherton Brook, a tributary of the River Penk flowed through the grounds of Rodbaston College.

The brook had a meandering planform, with a channel width of between 2m-4m. The surface geology was dominated by very friable sandstone with considerable erosion present in a few locations.

The channel was moderately shaded by a fringe of deciduous trees, dominated by alder *Alnus glutinosa*. Many of these appeared to have developed *Phytopthora* infection, and were dying. As a consequence, there was a substantial amount of Large Woody Debris (LWD) present in the channel. In places, this had accumulated to form stable woody debris dams, which were actively shaping the downstream river morphology. In conjunction with the tree- root system of the alders, this provided a high degree of instream cover.

Near to the downstream limit of the colleges holding, the LB of the river was partially bounded by a semi-derelict fence. There was very little gravel present in the channel, with the substrate dominated by fine sediment and leaf litter. As a consequence, habitat availability for spawning and juvenile trout was limited.

Towards the middle of the fishery, a small reed bed was present on the RB. This appeared to have been formed by straightening of the brook's channel in the past. There was evidence that the reed bed was drying out, with some encroachment of trees, particularly willow *Salix* Spp, noticeable.

There was clear evidence of dredging having taken place in this reach in the past. There was a substantial bund of excavated material on the RB, which was, as a consequence, significantly elevated with respect to the LB. Excavation of the surface of this spoil revealed an amount of riverbed gravel, providing confirmation of its origin.

The upper length of the river had a much steeper gradient, with the bed dominated by gravel of a suitable size for spawning trout. This was however heavily imbedded (compacted), posing likely difficulties for trout with respect to excavating redds.

Steep gradient and gravel dominated substrate in the upper section of the fishery

Excavated river bed gravel in deposits on RB of the brook

Stable LWD dam

There were large stands of Himalayan Balsam *Impatiens glandulifera* present along the banks of the brook. This introduced invasive plant had swamped much of the native vegetation, resulting in bare areas of bank, which were very vulnerable to erosion during high winter flows.

At the upstream limit of the reach, a small stream discharged into the brook. This took the drainage from a moated site of historical importance. The drainage was heavily laden with fine sand that had deposited within the channel.

2.0 Fish stocks

The status of fish stocks in the Otherton Brook is poorly recorded. Some trout parr and bullhead *Cottus gobio* have been captured during kick sampling for macroinvertebrates. Small perch *Perca fluviatilus* have also been seen in the brook. However, no formal assessment or monitoring of fish stocks has been undertaken.

3.0 Recommendations:

· In order to inform management decisions and to monitor any changes resulting from habitat enhancements undertaken to the brook, it is important that a quantitative assessment of fish stocks is undertaken. This should ideally comprise catch depletion electrofishing within a length of river isolated by stop nets, coupled with a semi-quantitative assessment of the remainder of the length of the fishery. It would be very useful if this could be combined with an electrofishing training exercise for the

students, perhaps with the assistance of the Environment Agency, or as part of a WTT Practical Visit (see below).

· The incidence of *Phytopthora* in the alders will inevitably rise, leading to a loss of many of the trees. As a consequence, shade and instream cover will be reduced locally. Planting of replacement trees at an early stage will ensure that some cover is maintained as the alders die back. Suitable replacement species include ash *Fraxinus excelsior*, hawthorn *Crataegus monogyna*, field maple *Acer campestre* and blackthorn *Prunus spinosa*. These are all native trees, with a high conservation value and a tolerance of riverside conditions.

· In places, alder and other species formed a dense canopy, overshading the channel and reducing the abundance of valuable fringing vegetation. It would be beneficial to decrease the incidence of shading in these locations through coppicing/pollarding of selected trees. No more than 20% of the available cover should be cut in any year, with the aim being to create a mix of shade/open water in the rough ration of 60/40. Any further opening up of the channel risks increasing the summer water temperature of the stream to above optimum for trout. By adoption of a cutting cycle of between 7-20 years, the optimum ratio of shade/open water can be maintained, whilst protecting the ecological and landscape value of the riparian trees.

· The large amount of LWD present was of great benefit to the stream. It provided excellent cover for a range of species, including fish. It concentrated flow, thus helping to shape the river's morphology, by scouring and sorting the substrate, and causing differential deposition of sediment. The stable LWD dams also act to detain leaf litter that is the basic foodstuff of many 'shredding' species of macroinvertebrates. There should thus be a general policy of retaining LWD in the channel, except where it poses an unacceptable flood risk or prevents access along the channel for migrating fish. LWD should be stabilised within the channel by the use of stakes and wire if necessary. Trimming of branches and local realignment of LWD can be usefully undertaken, in order to optimise its beneficial impact on river processes. This can include scouring out of new pools or maintaining the depth of existing pools. LWD can also be of great benefit in cleaning silt from, and sorting sediment sizes in gravel dominated riffles, used by spawning trout and rheophilic coarse fish species. Upstream facing LWD groynes can be used to direct flow into the centre of the channel, encouraging scouring here and deposition of fine sediment in marginal areas. Upstream facing groynes staggered along opposing banks can be used to create a longer section of fast, scouring flow along the central part of the channel. Further details are shown in the 'Wild Trout Survival Guide'.

· There was a limited amount of gravel present within the stream, particularly in the middle and downstream sections. This is likely to be limiting both spawning and subsequent survival of brown trout. In order to address this limiting factor, it would be beneficial to construct a series of shallow, gravel dominated spawning riffles. These could be simply constructed by importing gravel to the site and introducing it to the brook. Ideally, larger 'reject gravel' (mixed materials generally >75mm in diameter) or sandstone derived from locations within the college, should be use to construct a stable base to the riffle. This should be covered with a layer of finer gravel (ideally 10-40mm diameter) ideally at least 30cm deep, in order to create a final water depth of between 20cm-50cm. Water velocity over the gravel should be in

excess of 25cm sec^{-1}, with deeper areas left intermittently along the margins in order to provide cover for spawning trout. Sections of LWD should be introduced and secured onto the riffle in order to scour fine sediment and create a more diverse depth profile.

Each riffle should be at least 10m in length, with construction of riffles started at the downstream end of the fishery, progressing upstream, in order to avoid drowning out of each riffle by the construction of additional ones. Typically, a 10m riffle would require around 35 tonnes of stone to construct, at a price of £18/tonne (+ VAT) delivered to site.

· The gravel already present in the upper section of the fishery was heavily imbedded (compacted). In order to increase spawning success, it is important that the consolidated gravel 'pan' is broken up. This can be achieved by the use of LWD groynes (see above). Additional benefit can be obtained by utilising gravel washing using water pumps with a modified outlet. Starting at the upstream limit of the gravel riffles, the pressurised water jet is played over the gravel, loosening it and removing much of the silt trapped within it. This would make an ideal training exercise for students, perhaps as part of the WTT Practical Visit (see below) or in conjunction with the Environment Agency.

Gravel cleaning

· The reed bed on the RB was drying out. Over time, this will reduce its value as a conservation resource. In order to redress this and increase its wildlife interest, a series of 'notches' could be made in the top of the RB, so as to allow water to leave

the channel during higher flow events, and partially flooding the reed bed. Localised re-profiling of the bed could also be undertaken to create a series of ephemeral pools and scrapes, which would be of value to wading birds and wildfowl. The trees that have started to colonise the reed bed should be cut down to prevent further encroachment. A log pile otter holt could also be constructed at the edge of the site. Otters are gradually colonising most English rivers, and the combination of the reed and Otherton Brook offers a potentially very valuable section of habitat. Details of construction techniques are provided in the 'Wild Trout Survival Guide' provided as part of the advisory visit.

· The presence of Himalayan Balsam is undesirable. It is classified as an alien invasive weed species. There is no policy for its control on a catchment basis, with no authority having a remit to undertake this work. Despite this, it may be possible for the college to undertake limited control of the large stands of balsam present in some areas of the fishery. Chemical control with the herbicide glyphosate when the plant is actively growing in early spring should be effective. However, the forthcoming organic status of the college's farming enterprise is likely to prevent this course of action. As an alternative, the plants can be cut at ground level before the flowering stage (June) or they can be pulled up by the roots and disposed of by composting or burning unless seeds are present.

Note that the use of glyphosate or any other herbicide on or near water requires the consent in writing of the Environment Agency.

· The ingress of sand from the moated site drainage channel was not desirable. It is recommended that the stream be diverted parallel to the stream, and passed through a small constructed reed-bed, adjacent to the existing pond. There is an excellent opportunity not only to address the issue of the sand, but also to construct a valuable ecological and educational resource.

· The college should also continue monitoring of macroinvertebrate populations in the river. This involves taking a series of three minute 'kick-samples' of the riverbed. A fine meshed net is placed on the bed of the river, which is then disturbed using the sampler's feet for a total of three minutes, sampling all habitat types in proportion to their abundance in the channel. The samples are then placed in a labelled container (they can be preserved with alcohol if required for future sorting).

Samples are then subsequently sorted into invertebrate families. Each family is assigned a score under a system known as the Biological Monitoring Working Party (BMWP) with the highest scores reserved for the most pollution sensitive families. Scores for all families are then added together, to give a total for each sample taken. This score can then be compared to a predicted score based on elevation, geographic location, gradient, and general habitat of the site. Deviation of the sample from the predicted score would be indicative of a water quality or perhaps flow, perturbation. Further details of 'DIY' sampling strategies can be obtained from the Riverfly website at http://www.riverflies.org/ Suitable nets for sampling macroinvertebrates can be obtained from Alana Ecology www.alanaecology.com Tel: 01588 630173.

Partially constructed riffle showing stone base covered with finer gravel

· The semi-derelict fence at the downstream limit of the fishery should be removed, and a new fence erected outside the wild bird game strip, planted under the Countryside Stewardship scheme adjacent to the river. This will both ensure protection of the riverbank from grazing stock, and link the valuable wild bird strip to the riparian zone. This will improve the connectivity of these important habitat units. The fence line in other locations should similarly be pulled back in order to create well-vegetated buffer strips. There will be a need to manage these to prevent the further encroachment of invasive Himalayan Balsam.

· Funding for some of the work recommended might be forthcoming from the Wild Trout Trust who hold small 'pump priming' pots of money for projects of this nature. The Trust also operates a 'Practical Visit' scheme whereby a river restoration specialist undertakes up to 2 or more days work at the site in order to demonstrate techniques that are suitable to address the issues raised in this report. Contact the Tim Jacklin (Projects Officer) at the Trust projects@wildtrout.org for further details. Other potential funding sources include the Environment Agency or the Sharegift charity. This is a charity that collects unwanted share allocations and donates the profits to smaller groups undertaking a variety of work. Contact them at http://www.sharegift.org/

· A potential opportunity exists for Rodbaston to develop a facility for holding unique genetic strains of trout, for the production of eggs/fry for stocking into local river systems. The forthcoming review Environment Agency's Trout and Grayling

strategy is likely to place a premium on such a system. Further details can be obtained from Tim Jacklin at the Environment Agency. If such a scheme was instigated, then it might provide the focus for a WTT demonstration day to be held at the site, particularly if proposed enhancement work is extended into a wider community based project on the downstream River Penk.

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· Note that any works to bed or banks of the river or within 8m of its banks may require the written consent from the Environment Agency under the Land Drainage legislation. The introduction of any fish or eggs into any inland water requires the consent of the EA under the Salmon and Freshwater Fisheries Act, 1975. It is imperative that all relevant consents are obtained prior to the commencement of any works