Habitat Advisory visit to the River Avon at Amesbury, Wilts. Undertaken on behalf of Salisbury and District Angling Club by Vaughan Lewis, Windrush AEC Ltd November 2005

1.0 Introduction

This report forms the output of a site visit to the River Avon at Amesbury, Wilts, on 8th November 2005. Information in the report is based on observations on the day of the visit and additional comments provided by Salisbury and District Angling Club (SADAC) officials. Throughout the report, normal convention is followed, with right bank (RB) and left bank (LB) of the river identified when looking downstream.

2.0 Fishery Description

The River Avon at Amesbury was subject to a major enhancement scheme some 8-9 years ago. The work was undertaken by a fishery contractor, in conjunction with the club. It entailed significant narrowing of the channel using faggot bundles and chalk infill to create a walkway for anglers. The wetted channel behind the walkway provided habitat for a range of wetland species and a valuable low velocity refuge area for fish during high flows.

Unfortuanately, high flows soon after construction resulted in the partial failure of much of the work. As a consequence, the club has sought the advice of the Wild Trout Trust as to possible future management options for the reach.

Remains of previous river narrowing

The downstream limit of the reach was delineated by South Mill. Its backwater effect effectively precluded the implementation of any major enhancements for several hundred metres upstream of the mill. The backwater effect of the mill diminished significantly in the river length adjacent to the sewage treatment works, allowing consideration of practical enhancements to the river upstream of this point.

Neither the LB nor RB at this point was fenced, with significant loss of bankside vegetation and erosion resulting from grazing agricultural stock. Comparison with the section upstream that was fenced as part of the enhancement work clearly shows the loss of habitat and slightly overwide channel resulting from grazing pressure.

A raised bund was present on the RB. It is very likely that this bund was formed from material previously dredged from the river.

Elevated bund on the RB of the river

The river gradient appeared to change at the site of an old cattle drink, with the river upstream of this point shallowing to perhaps 1m deep on average. The cattle drink had become severely degraded, with unrestricted access to the river available to stock.

The sections of RB fenced as part of the previous scheme had developed excellent stands of emergent marginal vegetation and young willow trees. Consequent narrowing of the channel had increased flow velocity and diversity, helping to sort bed material and increase bed heterogeneity.

Strong growth of marginal vegetation in fenced areas. Note line of former enhancement (delineated by logs in water)

Considerable lengths of the previously installed enhancements had been lost, with only short sections still visible in the form of access bridges and lines of exposed stakes and logs. Some sections of deeper water were present alongside the bank as a result of erosion due to the collapsed revetment.

3.0 Recommendations for enhancement

- Erection of permanent or temporary (electric) fencing along the presently unfenced LB and RB of the lower reach would significantly reduce the impact of grazing stock on the river banks. Adequate numbers of stiles should be constructed for safe access for anglers over the fence. A standard 5-bar gate or lift out hurdles should also be installed to allow access for machinery along the bank.

Erection of fencing would result in increased marginal vegetation growth, which is valuable as cover for juvenile salmonids. The root systems of rough grass and emergent vegetation also help to bind together the bank structure, reducing erosion and allowing the vegetation to spread and narrow the channel. Locally increased water velocities result, helping to create diversity in the bed profile of the river. It is possible that financial assistance for the erection of fencing may be available to the landowner under pre-existing or recently introduced agri-environment schemes.

- The installation of faggot bundles along the fenced sections would both encourage the rapid development of a vegetated margin and the narrowing of the channel. It is recommended that faggot revetment should only be installed where the bed profile adjacent to the bank is shallow. In some sections, the vertical driven poles remained from the original enhancements. It would be a simple and desirable process to reweave a mix of deadwood faggots and live willow wands (from on-site coppicing) between the stakes, reforming the previous line of the revetment. Subject to ensuring that nesting birds are not disturbed, it is recommended that the installation of faggot/willow revetment and construction of islands is undertaken during the late spring period, in order to allow adequate time for vegetative growth to stabilise these structures before they are subject to high winter flows. Some of the wooden bridges remaining from the original enhancements posed a possible Health and Safety risk and should be removed from the water.

- Areas of deeper water alongside the bank resulting from the historic enhancements should be allowed to remain unchanged.

- An alternative to narrowing from the banks is the construction of small, mid-stream islands. Benefits include the creation of refuge areas for animals and plants. Remote from human disturbance and grazing, they may support different plant communities compared to more accessible banks. Some criticism of the construction of islands in small chalk streams has been received from geomorphologists, who note that the occurrence of such features naturally is unusual in these low energy environments.

Islands can be created from a range of materials, including faggot bundles, coir fibre rolls retained by wooden stakes and infilled with either locally derived granular soil or brushwood bundles. It may be necessary to protect the upstream toe of the island from erosion using loose stone ('rip-rap'). Size of the islands can be varied, but should generally be in the range 2m-4m width, with length between 4m-8m. The construction of 5-10 of these islands in the lower section of the reach would prove to be of benefit, creating varied flow conditions in this presently fairly uniform river length.

- Whilst there was some Large Woody Debris (LWD) present within the channel, there were opportunities to encourage a controlled increase in the amount of this valuable material. Measures to increase LWD should focus on the provision of cover

logs in marginal areas by the simple expedient of trimming small to medium sized trees to an acceptable size and then felling them into the river channel. They can then be pinned into position using driven wooden stakes. Stable LWD of this sort is of particular long term value, allowing the build up of weed/debris rafts and associated beneficial macroinvertebrates that are vital components of the energy cycle of river systems. Sediment accreting within and downstream of LWD will eventually be colonised by emergent vegetation, helping to narrow the river channel. Weed raft/ fallen tree complexes also provides excellent cover for adult fish.

- It is also recommended that there should be a presumption against the removal of any naturally fallen timber. Such material can be pinned in place as described above with all the associated advantages stated. Advice relating to the management of LWD in the channel is predicated on the assumption that its retention does not cause any increased risk of damaging flooding. This risk should be assessed in conjunction with the EA's Development Control and Flood Risk Management departments.

- The derelict cattle drink would need to be reconstructed to allow safe, fenced access to a restricted watering area for stock. A shallow gradient (1:20) ramp should be excavated, lined with Terram or similar geotextile, and overlain with a 200mm plus layer of 100mm crushed stone. Treated timber post and rails should be erected to prevent stock access to the river outside of the defined drinking area.

- The upper length of the river could probably be fished by wading, provided that safe access is made into and out of the river, and that a safe depth for wading is present throughout. Simple access walkways across unconsolidated, soft marginal areas can be constructed by firmly driving 75mm-100mm diameter poles (probably willow from on-site pollarding) into the bed at 0.3m intervals in two straight lines, 0.8m apart. The area between poles should be infilled with layers of willow brash, with each layer laid perpendicular to the last, in order to form a tight mattress. This mattress should be retained by two wooden spars laid above it and nailed to each line of stakes. Larger timber boughs (75mm diameter) should then be packed tightly across these spars and nailed in position, so as to create a finished footway. A simple wooden handrail can be erected to provide safe support. The willow walkway will grow, with its root systems further stabilising the structure. Colonisation will also take place from surrounding emergent vegetation.

- If wading is possible, it significantly reduces the amount of bank maintenance required for angling. This would allow the development of densely vegetated banks, valuable for both trout and general habitat considerations (see above). It is important that excessive wading does not take place in shallow areas between October and March, as trout and potentially salmon eggs will be present in the gravel. These can easily be damaged by mechanical shock.

- The deeper, downstream section of the reach could be improved by the introduction of gravel riffles. Gravel could potentially be obtained by the excavation and screening of the RB raised bund. Trial pits would need to be dug into the bunds in order to ascertain the percentage of gravel present within them and a cost-benefit balance undertaken regarding the value of their on-site screening. Alternatively, gravel could be imported to site from a local mineral quarry. The lowering of the bund would not only provide an opportunity for local sourcing of gravel but would, in

concert with the elevated summer water level resulting from riffle construction, potentially allow the restoration of the old water meadow systems on the RB and LB of the river. The recent award of European funding to the RAVI LIFE project in the Avon catchment may provide an opportunity for implementation of large scale habitat enhancement scheme of this nature. It is recommended that contact be made with Dr Allan Frake at the Environment Agency's Blandford Forum office for further discussion regarding the feasibility of such a scheme.

- The creation of gravel dominated riffles will increase the availability of this valuable and under-represented habitat type. In addition to spawning and juvenile salmonids, a range of species is associated with gravel riffles, in particular water crowfoot. In general, it is recommended that riffles should be constructed to be a minimum of 15m in length. Each riffle will increase the retained head, probably by between 15cm-30cm, with the extent of this backwater effect being modelled as part of the detailed design process.

Optimum conservation benefit is obtained if the depth of gravel in each riffle exceeds 50cm, with a range of macroinvertebrate species requiring a hyporheic zone of this depth to reproduce successfully. In order to optimise spawning conditions for brown trout, water velocity should be between 25cm/sec – 75cm/sec, with a water depth of between 25cm and 60cm. Gravel size should vary between 10mm and 40mm diameter in order to optimise successful trout spawning and egg hatching.

- In order to provide a level of flood compensation, a series of low level marginal shelves could be excavated along the length of the constructed riffles, with the spoil disposed of outwith the floodplain, possibly at the old tip site some 60m from the RB of the river. Excavation of low level shelves will not only mitigate for potential flood risk, but would also provide valuable wet margin habitat for a range of species.

- Note that all works to bed or banks of the river or within 8m of its banks 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 by the club.

- A Flood Risk Assessment may be required as part of any Land Drainage consent application. No Flood Risk Assessment has been undertaken as part of this design package.

5.0 Disclaimer

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