Habitat Advisory visit to the Little River Avon, Charfield, Glos, undertaken on behalf of Charfield Angling Association, by Vaughan Lewis, Windrush AEC Ltd
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1.0 Introduction

This report forms the output of a site visit to the Little River Avon, Charfield, Gloucestershire, on 10 March 2005 on behalf of Charfield Angling Association (CAA). The visit was sponsored by English Nature as part of their support for the Wild Trout Trust's Advisory Visit scheme. Information in the report is based on observations on the day of the visit and additional comments provided by Jon Ogbourne and Nick Strang of CAA

CAA is a club of some 50 members, who fish the Little River Avon and Ozleworth Brook. The club's fishery on the Avon runs from Damery to the road bridge at Charfield Mills, whilst its holding on the Ozleworth Brook runs upstream from Charfield Mill to the new Reneshaw's bridge. Further details of the club's waters and fishing information can be found on their website www.charfield.net

Somewhat unusually, the club allows both fly and bait fishing for the salmonids and coarse fish present, making this a true mixed fishery, with members encouraged to practice catch and release for both brown trout *Salmo trutta* and grayling *Thymallus thymallus.*

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 Little Avon rises upstream of Wickwar, Glos, and flows in a roughly southerly direction for some 15km, before entering the estuary of the River Severn via Berkeley Pill, Berkeley.

The surface geology of the river appeared to be a mix of friable sandstone and clay, with the surrounding mass of the Cotswolds providing inputs of base rich spring flow.

The fishery was predominantly rural in nature, flowing through a mixture of pasture and arable fields.

The downstream section of the fishery (from Damery Mill to the railway bridge) was structurally excellent, with a strongly meandering planform and a wetted width of between 3m and 6m. There was an abundance of gravel shallows suitable for brown trout and grayling spawning, with adjacent shallow glides and pools essential for juvenile and adult fish respectively. Despite their abundance, the gravel riffles were, in the main, poorly sorted with moderate volumes of entrained sand and fine sediment present. The gradient of the river was steeper towards the upstream limit of the reach, with more a depositing habitat type towards Damery Mill at the downstream limit.

Active erosion was taking place at a number of sites in the river, resulting in a good supply of coarse substrate to the river channel. In places, this had built up forming side-bars, point bars and mid-channel islands.

Instream vegetation was limited to small stands of willow moss *Fontinalis antipyretica*.

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Typical section of the Little Avon, showing pool, glide and riffle (in background).

Coarse substrate mid-channel island, beginning to colonise with vegetation

The banks were heavily tree-lined, with alder *Alnus glutinosa* the dominant species. Many of the alders were multi-stemmed, having been historically coppiced. There was evidence of *Phytophtora* infection in some of the alder trees. The tree canopy was very dense in places, with the associated heavy shading restricting the growth of fringing vegetation valuable as cover for trout and for protection of the banks from erosion. The extensive root systems of the trees provided good cover for a range of fish species, particularly where the banks had been undercut beneath the roots.

There were some significant Large Woody Debris (LWD) dams in the river, with some of these forming stable features that had resulted in extensive downstream bed scour and substrate sorting.

The presence of river-borne debris high in the bankside trees provided an indication of the large spates that are experienced by the Little Avon.

Large woody debris dam

Water quality in the river is believed to be generally good, with hatches of pollution sensitive Ephemerid species including mayfly *Ephemera danica*, still strong. A small hatch of large spring olive *Baetis rhodani* was taking place during the site visit.

Land use on both banks did not generally pose a significant risk to the fishery. There were very short sections of bank poached by agricultural stock and horses, whilst the

buffer strip between the maize field on the LB at the upper end of the reach would ideally have been wider in order to control sediment run-off.

Otter *Lutra lutra* have been seen at the fishery, with large numbers of mink *Mustela vison* also known to be present.

The Ozleworth Brook had a large impoundment immediately upstream from the club's car park. The weir was some 1.8 m high, stopping all upstream migration of fish and effectively isolating the upstream reach. Probably as a consequence of this, the weir marked the upstream limit of grayling in the Brook.

Instream habitat upstream of the weir was uniformly deep glide, reflecting the impact of the impoundment. The RB of the channel was heavily shaded by riparian tree growth.

The gradient of the brook downstream of the weir was relatively steep, with some strong stands of water crowfoot *Ranunculus* spp present in the faster flows. The channel was otherwise similar to the Little Avon, being strongly meandering, with a well-developed pool-riffle regime, abundant spawning gravel, and dense shade in places, cast by riparian trees. There were some LWD dams, which, in conjunction with the tree root system, provided a valuable source of cover for fish.

Weir on the Ozleworth Brook

3.0 Fish stocks

The river had good stocks of both brown trout and grayling. Moderate to good recruitment is believed to take place annually, with members often catching fish of 10cm-15cm in length of both species. Rainbow trout *Onchorhynchus mykiss*, probably emanating from upstream fish farms, are caught regularly, whilst coarse fish including chub *Leuciscus cephalus*, roach *Rutilus rutilus*, dace *Leuciscus leuciscus* and perch *Perca fluviatilus* also feature in catches.

In addition to the stock of wild fish, the club stocks some 150 brown trout >12" in length. These fish tend to congregate in the larger pools from where it is believed that many have been removed by poachers.

4.0 Recommendations

- Long lengths of the main river and the Ozleworth Brook are overshaded. It would be of great benefit if a regime of rotational coppicing/pollarding could be established alongside both watercourses. The aim of this should be to decrease shading, allowing the growth of vegetation on the banks, whilst retaining valuable tree root systems. Arisings from the tree cutting could be utilised to create faggot bundles that could be used to protect eroding sections of the riverbank or for the creation of stick pile otter holts. Details of the use of faggots are provided in the Wild Trout Trust's (WTT) 'Guide to Improving Trout Streams' provided to the club

➢ Where possible Large Woody Debris (LWD) should be retained in the channel. Large woody debris (LWD) is an integral component of stream ecology. The benefits for retaining it are clearly laid out in the recent EA R&D document, "Large Woody Debris in British Headwater Rivers". Key conclusions of the report include:

- ❖ An increase in both mean flow depth and velocity and variability of both parameters.
- ❖ The development of high physical habitat diversity both in-channel and in the floodplain. Removal of LWD reduces both habitat quality and availability for juvenile and adult brown trout.
- ❖ Although active LWD dams may impair upstream migration of fish at low flows, they rarely do so at high flows.
- ❖ LWD have significant benefits to the control of run-off at the catchment scale.
- ❖ River and riparian management has important effects on the distribution and character of dead wood accumulation within the river system.

The report also provides recommendations for the management of LWD, the most important of which is "although there are certain situations that may require wood removal to eliminate stream blockage, the wisest management is no management". Building on this simple truism, it is recommended that before any future work to remove LWD from river channels is undertaken, the wider implications of the proposal on the whole river system are considered, rather than just the potential (in many cases unproven) benefits to salmonid populations. In addition, the impact of planned riparian tree work on the supply of LWD to the river should be considered. In some circumstances, it may be beneficial to allow trees to fall into the channel, provided the risk of increased flooding is acceptable. The implications of this change

in management strategy should be discussed and agreed with the EA's Flood Defence team in order to minimise risks to local flooding.

- The success of brown trout egg hatching can be enhanced by establishing a regime of cleaning spawning gravels annually in late September. This can be achieved by either manual raking, or by the use of high-pressure water jets. Care must be taken to clean riffles rotationally, with only short sections being treated annually. It is important that the EA are contacted prior to any cleaning of gravel, due to the possible discoloration of water in the river resulting from the operation. The same concerns dictate that downstream neighbours should also be forewarned of the operation.

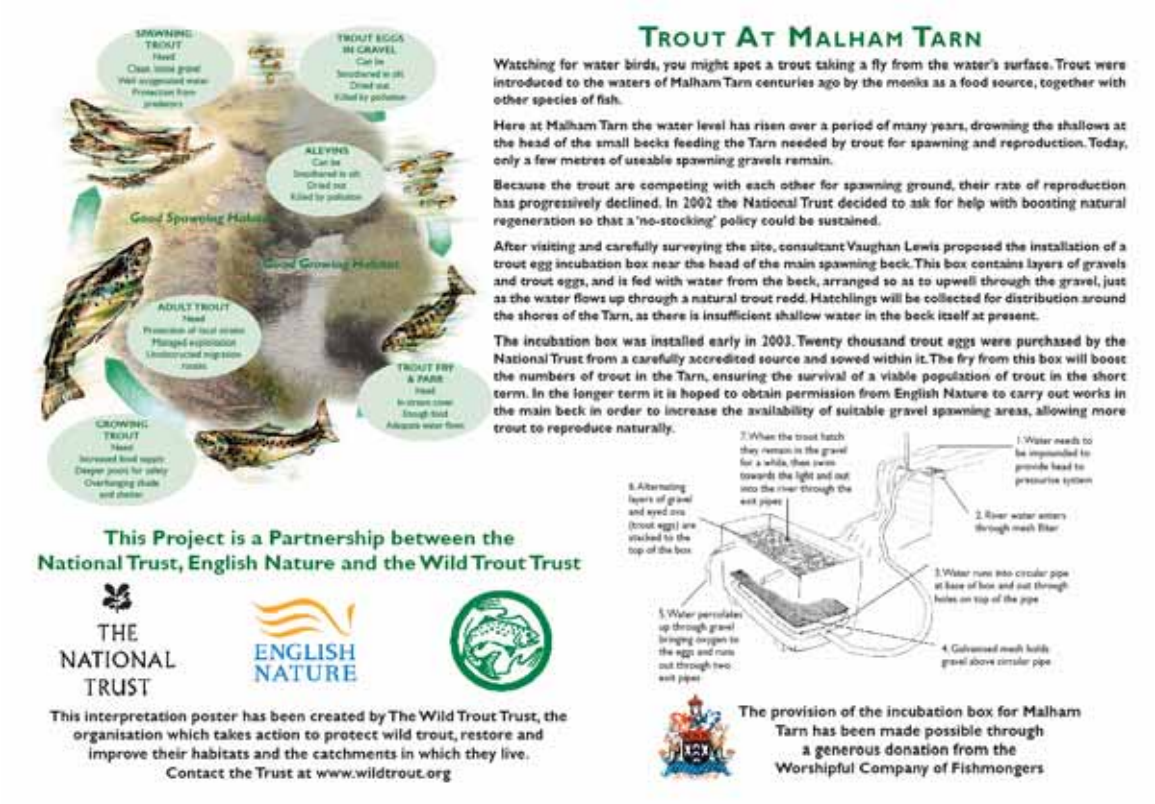
- In order to gauge spawning success, it would be of great benefit if an annual count of brown trout redds could be made. This should be undertaken over the same length of water annually, during the period November – January, in order to allow inter-year comparisons of spawning success. Examination of the river at night using a torch would also allow numbers and size of individual fish spawning to be recorded.

- Given the relatively good stocks of wild fish and the concerns regarding poaching of stocked fish, it may be prudent to cease stocking for a trail period of 2 seasons in order to ascertain whether the club's fishery can survive on natural recruitment alone.

Rather than stock with large, hatchery reared fish, it would be possible to produce semi-natural fish through the use of deep substrate incubation boxes. Basically, these are gravel filled boxes, approximately 0.6m in each dimension, which are filled with suitably sized gravel and seeded with 10,000 - 20,000 trout eggs. A water feed at the bottom of the box allows the eggs to incubate and hatch. Once they reach the swim-up fry stage, they leave the box via the overspill pipes, stocking themselves into the river. In effect, they are naturally reared fish without the unhelpful behavioural modifications associated with hatcheries. Such a system could be established on one or more of the impoundments within the river, using the head loss across them to drive the boxes. More details on incubation boxes can be found on the Wild Trout Trust web site www.wildtrout.org or in Volume 2 of the Trust's magazine, *Salmo trutta*.

- If it has not already done so, the club should endeavour to obtain and archive data on its fishery. As a minimum, details of the following should be obtained from the EA:
  - Results of electrofishing surveys undertaken either by the EA.
  - Results of macroinvertebrate monitoring
  - Water quality data for the river
  - Details of abstraction, both surface water and groundwater, from the catchment

Incubation box in operation on a Norfolk river



Description of incubation box installed at Malham Tarn, Yorkshire

- It would theoretically be possible to install a bypass channel around the weir on the Ozleworth Brook in order to allow passage of fish around this obstruction. However, this would be a significant project that would require the detailed input of the Environment Agency into both design and construction.

- 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.