



Wild Trout Trust Habitat Advisory visit
to the Little Brosna, Counties Offaly
and Tipperary .
Undertaken on behalf by Vaughan
Lewis, Windrush AEC Ltd
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Windrush Aquatic
Environmental Consultancy

Windrush AEC Limited
Registered Office: The Cottage
Fordwells, Witney,
Oxon. OX29 9PP

Telephone: 01993 878573
Email: vaughan@windrushaec.co.uk

1.0 Introduction

This report is the output of a site visit undertaken on 20 August 2011 by Vaughan Lewis, Windrush AEC Ltd to the River Little Brosna, Co. Offaly/Co.Tipperary: the river forms the boundary not only between the two counties but also between the provinces of Munster and Leinster. The visit was undertaken on behalf of the Wild Trout Trust (WTT) for Birr Angling Club, who control the fishing rights on long stretches of the Rivers Little Brosna and Camcor near Birr. The club has approximately 50 members.

Comments in the report are based on observations on the day of the site visit, and discussions with members of the club. 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.

2.0 Habitat description

The main section walked was reach of some 600m downstream of Birr. The river at his location ran between grazed grass fields on both banks. Long sections were unfenced, with significant erosion in places. Where the banks had been eroded, extensive stands of emergent vegetation had grown in the river. The consequences of this damage were a general over-widening and shallowing of the channel, with a reduction in water velocity and scouring of the bed.



Typical length of the Little Brosna showing eroded bank and resulting emergent vegetation stands

The resulting channel was some 12m-15m wide and heavily incised following past dredging, with the bed perhaps 2m lower than the natural level. The river was gently meandering, with a depth varying between 0.3m and 1+m. The evidence of the extent of the past dredging was abundantly clear from the raised bund on the LB and the associated piles of exposed stone.



Raised bund of dredged material on LB with rocks clearly visible

There were some long sections of gravel visible. Closer inspection however revealed that much of this was Tufa, a soft 'pseudo-gravel' formed when groundwater deposits calcium carbonate onto a nucleus, for instance a small piece of gravel or twig. The creation of Tufa gravel is a natural process, but its abundance may be increased by man-made impacts on habitat. It generally provides poor quality spawning habitat, due to concretion of the bed affecting both the ability of trout to spawn successfully, and the subsequent hatch rate of any eggs deposited.

A series of small stone weirs had been installed in the past in an attempt to improve habitat within the fishery.



One of series of small stone weirs present in the fishery

Mixed submerged and emergent weed was common throughout the fishery, with species including un-branched bur-reed, common rush, water crowfoot, starwort and hemlock water dropwort present.



Extensive growth of submerged weed

The lower section of the reach was deeper and more impounded, as a result of the general morphology of the river, and partly due to the influence of an increased abundance of Large Woody Debris (LWD), which had in places formed significant debris dams. There was also significant shading in this section as a result of extensive riparian tree growth on the RB.

There was again a significant bund of deposited dredgings on the LB, and evidence of extensive cattle poaching in places.



Deeper downstream section showing shading by riparian trees

The Camcor and Little Brosna contain populations of the increasingly rare white-clawed crayfish. These are cited in the International Union for the Conservation of Nature (IUCN) Red List of endangered species, along with iconic animals such as tigers. The river also has a population of otter.

3.0 Fish stocks

The rivers have a good stock of wild brown trout, including a population of croneén. These are brown trout that migrate annually from the downstream Lough Derg to spawn in the rivers. Their lifestyle is therefore similar to other species migrating from large Irish lakes, for instance the dollaghan of Lough Neagh. Anglers regularly catch croneén of more than 1kg in weight, with individual fish in excess of 1.5kg not uncommon. They receive special Heritage Status protection.

The upper River Camcor and its tributaries are key spawning areas for trout, with significant recruitment to the downstream Brosna coming from this source. For several years, Birr Angling Club ran a deep substrate incubation box to augment natural recruitment on the Little Brosna. This practice has now ceased following

concerns raised by Inland Fisheries Ireland (IFI) regarding introgression of fish farm genes into wild trout populations.

Whilst the club promote fly fishing and 'catch and release' of trout, there is still a significant number of fish killed annually, with anglers legally allowed to spin and worm fish, and to take up to three fish per day.

The river also has a significant run of Atlantic salmon, with fish spawning in the Little Brosna and Camcor.

4.0 Water quality, water quantity and macroinvertebrate populations

The Little Brosna has been subjected to significant poor water quality in the past, with several severe pollutions from industrial discharges and poor quality effluent from local sewage treatment works. Some of these events killed large numbers of fish. Work to upgrade the sewage treatment works appears to have improved the quality of their discharges, although club members noted that increased development in the local area was putting a significantly greater load on key works, with a need for further upgrade likely in the near future.

Offaly County Council currently abstract up to 3,000m³/day from the Little Brosna/Camcor catchment. There are proposals in place to increase this to 5,000m³/day in the near future, potentially increasing the pressure on water flow during low flow periods. With regard to high flows, anglers observations seem to suggest an increase in 'spatey' flows within the river system, with higher peaks and lower summer flows. This may be the result of local development and perhaps changes to farming practices over time.

The Little Brosna Water Management Action Plan, prepared by Shannon River Board under the provisions of the Water Framework Directive, classifies the Little Brosna at Birr as being of 'moderate' quality. A number of pressures and risks are highlighted, including:

- Birr Waste Water Treatment Plant
- Diffuse source pollution from agriculture and forestry (Camcor).
- Increased siltation and compaction of the riverbed

The impacts of nutrient enrichment are expressed by the luxuriant weed growth in the river, with the water quality perturbations reflected in the presence of pollution tolerant macro-invertebrate species.

5.0 Recommendation for future management

- In order to protect the brown trout stocks of the river, a general presumption of catch and release should be adopted. Whilst this may be difficult to enforce initially, peer pressure by keen anglers has been shown to be an effective tool for trout conservation over time.
- Working with IFI and local landowners, the club should seek to reduce the impact of diffuse and point source pollution from agriculture (see <http://www.teagasc.ie/environment/REPS/REPS.asp> and <http://www.agriculture.gov.ie/>)

- Typical issues that should be addressed include the location of slurry pits, and silage clamps, overgrazing of riverside fields, run-off along pathways/farm tracks and the application of excessive fertilisers on fields draining to the Little Brosna/Camcor. Further information is provided in the WTT Upland Rivers Habitat Manual available as a PDF www.wildtrout.org. This is not an easy problem to tackle but with some determination, farmers can be engaged to tackle these issues, particularly if suitable financial incentives can be identified. These measures are vital if the river is to achieve 'good ecological status' under WFD. As such, they should attract the support of both the relevant county councils and IFI.
- There are a number of physical enhancements that could also be undertaken by the club that will improve habitat within the river and help it to achieve 'good' ecological status under WFD. These include:

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- ❖ Fencing of the river bank, either seasonally or permanently is vital to reduce the damaging impact of overgrazing. There is also a need to provide a clean water supply once fencing has been erected, probably by the construction of well-designed cattle drinking areas. Fencing should ideally be erected at least 5m from the river in order to create a well vegetated buffer strip capable of reducing erosion and minimising run-off from the adjacent fields. Densely vegetated buffer strips of this type will also benefit other key species including otter, hence increasing its general value to wildlife interests.



Well designed cattle drinking area

- ❖ Introduction of gravel and stone has a range of beneficial impacts. It helps raise the water level at low flows, increasing connectivity with flood plain meadows to the benefit of its ecology and the attenuation of flood flows damaging to downstream property. It will partially restore the morphology of the river damaged by past dredging and it increases the length of good quality spawning habitat for trout, salmon and white-clawed crayfish.

In general, it is recommended that each gravel shallow (riffle) should be constructed to be a minimum of 15m in length. Each riffle will increase the upstream water level probably by between 15cm-30cm. It is therefore essential to undertake all riffle construction in an upstream direction and understand that the increased head of water may increase local groundwater levels. This can be beneficial to the conservation status of floodplain meadows, but may have agricultural implications that should be considered.

Optimum conservation benefit is obtained if the depth of gravel in each riffle exceeds 50cm, with a range of macroinvertebrate species requiring at least 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 (both measured during the late autumn/winter period).

Stone and gravel for riffle construction may possibly be obtained from on-site excavation of the spoil from previous dredging deposited on the river's edge. This will not only be the cheapest option, but will remove the undesirable bund alongside the LB of the river. If this option is not possible, then gravel and stone will need to be imported to the site from a nearby quarry.

- ❖ The small stone weirs should be totally or partially removed so as to reduce their impounding effects. The stones resulting from removal can be spread at random in the downstream reach, forming individual lies for trout and salmon, or used to form 'D' shaped deflectors (see below)
- ❖ There is a lack of LWD in the channel. This is important for scouring channel form and creating areas of deeper water and gravel shallows. Where possible, trees should be introduced into the channel at strategic locations and fixed using a combination of wooden stakes, metal pins and wire. Generally, LWD should protrude up to 50% of the width of the channel, and should face in an upstream direction to optimise mid-stream scour. Further details are available from the Upland and Chalkstream manuals on the WTT website.



Tree trunk on RB of the Little Brosna: a suitable candidate for introduction as LWD

- ❖ There is a lack of tree cover on the river. A programme of tree planting is therefore important, with species including alder, ash, field maple and willow ideal. Tree planting is also an ideal project for volunteers, including children/students. Building a working relationship with other sectors of the community is an excellent way of highlighting issues of concern with rivers and reinforcing their value to society.

- ❖ Bundles of smaller logs/brushwood can be securely pinned to the banks of the streams where erosion has taken place. They not only help to protect the bank (particularly willow that will re-grow into the bank, helping to form a protective living mattress) but provide dense and valuable cover for juvenile trout.

- ❖ Increased amounts of cover and bed variation can also be provided by the use of stone deflectors. These comprise of a series of large boulders arranged into a rough upstream facing 'D' shape in the centre of the channel. In combination, they increase water velocity creating scour and cleaning fine sediment away from potential spawning gravel.



A 'D' shaped deflector in a small limestone stream

- It is vital that any works planned are done in conjunction with both the Inland Fisheries Ireland (IFI) and the local council. It may be possible for WTT to undertake a Practical Visit to the Little Brosna to demonstrate some of the techniques outlined in this report. In addition, the Wild Trout Trust may be able provide a number of ways of helps club with their fund raising for projects. These include the 'Rods for Conservation' scheme where a Hardy or Sage rod could be provided at cost to Birr Angling Club for raffle. This can then be auctioned to raise funds. Advisory visit bursaries may also be available from the Trust up to a value of £1,500 (or Euro equivalent); these are aimed at helping clubs secure matched funding for project work. For more information contact Tim Jacklin projects@wildtrout.org
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