



Advisory Visit

Bunnadober River, Co. Mayo, Eire

16th December, 2008



1.0 Introduction

This report is the output of a site visit undertaken by Tim Jacklin of the Wild Trout Trust to the Bunnadober River, Co. Mayo, Eire on 16th December 2008. Comments in this report are based on observations on the day of the site visit and discussions with Trevor, Wesley and Michael Seery, and Dennis Moss.

Normal convention is applied throughout the report with respect to bank identification, i.e. the banks are designated left hand bank (LHB) or right hand bank (RHB) whilst looking downstream.

2.0 Fishery Overview

The Bunnadober River is small river approximately 4 km long running into Lough Mask, one of the great limestone lakes of the west of Ireland. The river runs into the east side of Mask, just to the north of Ballinchalla, approximately 10 km south west of Ballinrobe.

The river has a different character in its upper reaches (about one third of the total river length) compared with the lower reaches. The former includes the spring source of the river in karst limestone geology, and there is a moderate gradient to the river channel. In contrast the lower two-thirds flows through cutover peat and has a very low gradient; this section has also been modified by dredging for land drainage.

It is not thought that the river is fished, and the purpose of the visit was to explore the possibilities of improving the habitat for spawning trout that may run the river from Lough Mask.

3.0 Habitat Assessment

Despite its short length (4 km) the Bunnadober has a relatively constant, high volume flow of good quality water from a spring source in the limestone geology of the area. About 1.5 km from the source is a former water mill which made use of the constant flows to power both a vertical undershot waterwheel and a horizontal waterwheel. The mill is now owned by the Office of Public Works (OPW) and is a National Monument, and could in the

future be restored as a working mill for heritage and tourism. Water currently bypasses the mill through some redundant sluices (with slots for boards) and the former mill race downstream of the mill is not in use.

Upstream of the mill is the former mill pond where water would have been impounded to power the mill. Since the mill fell into disuse, the river has reverted to its natural width through the encroachment of marginal vegetation (Photo 1).

The upper river just below the source is wide and shallow, running through a wet, undrained floodplain (Photos 2 and 3). A typical flora of calcareous areas is present with starwort *Callitriche* sp., mare's-tail *Hippuris vulgaris*, fool's water cress *Apium nodiflorum*, lesser water parsnip *Berula erecta*, and water cress *Rorippa* sp. present. There are also stands of rushes, sedges and grasses. It is not clear whether the channel is naturally wide and diffuse, or whether this is the result of man's activities in the past. There is a stone side to the channel on sections of the left bank, possibly an extension upstream of the works to construct the mill pool.

The habitat upstream of the mill is excellent for juvenile trout, but unfortunately there is little, if any, spawning habitat. The bed substrate is uniformly fine sediment because of the wide channel and the associated low water velocities. There are one or two short sections where the river occupies a more defined channel (for example alongside the conifer plantation); here the bed substrate comprises coarser gravels which are the right size for trout spawning, but poorly sorted.

Downstream of the mill, there are a series of low weirs in the channel creating a stepped effect, and then the channel enters a straight section between stone walls, with a relatively steep gradient. Between the low weirs there is a good gravel substrate which is suitable for trout spawning. It is likely that this has been introduced as a spawning habitat improvement. The steeper, straight channel may also have had boulders deliberately placed to create flow variation and retain pockets of gravel for spawning. There is also some good juvenile trout habitat in this section in the form of soft, vegetated margins and cobbles and boulders in the channel.



Photo 1 Former mill pond, now with open sluices. During the operation of the mill, boards would have been placed in the sluices, and the overspill is where the people are walking. The mill is to the left of the picture.



Photo 2 Upper river just below the source – wide and shallow



Photo 3 Upper river



Photo 4 Fine sediments in the upper river



Photo 5 A more defined channel in the upper river (alongside conifer plantation)...



Photo 6 ...and coarser sediments in the faster flow (although still poorly sorted).



Photo 7 Downstream of the mill: low weirs, good gravel and vegetated margins. Probably the result of a fishery habitat improvement project.



Photo 8 The lower section of the straight steep channel, showing boulders (placed?) and pockets of gravel

Downstream of the steep, straight, walled channel, the river changes in character as the gradient of the channel levels out. The channel is wider and the bed substrate is marl overlain with a thin layer of fine gravel (Photo 9). There was evidence of the removal of some marginal vegetation here; this is apparently a common practice in late summer/early autumn on the limestone tributaries of the large loughs to prevent total encroachment and facilitate access for spawning trout.

The channel retains some gradient and a reasonable flow velocity (Photo 10) with progress downstream to an outcrop of limestone bedrock across the channel which forms a cascade and a deep scour pool. Beyond this point the channel is very low gradient, overwide and has been dredged for land drainage (Photo 11); the channel is full of emergent vegetation (Photo 12).

There is a new fence on the right bank which is protecting the river margin from cattle grazing. The left bank has an old fence in a poor state of repair. Spoil heaps from previous dredging can be seen on the left bank downstream of the ditch confluence which prevented further progress.

Overall the habitat for trout on the lower section of the river is poor. There is no spawning habitat and the wide, slow, weed-choked channel is not good habitat for juvenile or adult trout. The amount of emergent vegetation in the channel could be a barrier to adult trout running up from the lough to spawn; this visit was in December when much had died back, yet there was still a considerable amount present. There was little evidence of spawning activity on the gravels near the mill, which contrasted markedly with some small tributaries of Lough Corrib which were visited subsequently (see below). This suggests that there are few trout currently using the Bunnadober for spawning.

After visiting the Bunnadober, the Ballynulty Stream and the Ballycurran Stream (both tributaries of eastern Lough Corrib) were visited. The habitat in these small streams has previously been degraded through land drainage (bed lowering and straightening), course alteration and agricultural impacts (overgrazing and bank poaching). In the last five or six years the Headford Angling Club has undertaken habitat restoration on these streams, in conjunction with the Western Regional Fisheries Board (WRFB) and the OPW. This has involved the introduction of gravel, the creation of pool habitat with low weirs (the streams have low flows in summer), and riparian fencing.



Photo 9 Fine gravel overlaying marl



Photo 10 Area of higher bed level and higher water velocity



Photo 11 Dredging spoil piles on the far bank; new fence in the foreground.



Photo 12 Low gradient, lower river – wide, slow-flowing and with emergent vegetation across the whole channel. The hills in the distance are on the far (west) side of Lough Mask.



Photo 13 Ballynulty Stream – straightened and dredged (spoil heaps on LHB); the subject of a habitat improvement project



Photo 14 A large trout redd on introduced gravel in the Ballynulty Stream



Photo 15 The bed of the Ballycurran Stream in an un-restored section – note the weed cover



Photo 16 Introduced gravel on the Ballycurran Stream, with evident trout spawning activity

Plenty of trout spawning activity had occurred in both streams, and redds were clearly evident throughout the improved sections. On the Ballycurran Stream it was interesting to see the contrast between the restored and un-restored sections; the latter were slow-flowing with a bed covered in vegetation comprised of species favouring slow flows (e.g. broad-leaved pondweed *Potamogeton natans*). There was no spawning activity in the un-restored sections, although these may provide valuable cover for fry and parr and help to hold up water levels in summer.

4.0 Conclusions

Factors limiting trout production on the Bunnadober are most likely to be poor access for adult fish from the Lough (due to weed choking), and lack of spawning habitat. Spawning habitat appears to have been improved just downstream of the mill, but unfortunately there is little suitable juvenile habitat downstream of this point. There is some good juvenile habitat upstream of the mill but unfortunately no spawning habitat.

5.0 Recommendations

- Contact the WRFB and see if there is information from electric fishing surveys that supports the potential habitat bottlenecks identified above. Find out what habitat improvement work has been carried out previously, and whether the effects of this have been successful. Discuss the report and its recommendations with WRFB and find out how these improvements would contribute to improving trout stocks in the lough, relative to habitat improvements elsewhere.
- Improve access for adult trout on the lower river. This may be achieved through narrowing the river channel and/or raising the bed level, and planting trees for shade. There is however some uncertainty over whether this would be successful given the low gradient on this section; it is therefore suggested a trial is carried out on a short section to see if the channel could be kept relatively free of emergent vegetation.

Techniques for channel narrowing are described in the *Wild Trout Survival Guide* (supplied) and the creation of a two-stage channel within the current bank line is probably the best option here. There is ample material in the dredged spoil heaps for using as backfill.

It is important to ensure that landowners and the appropriate authorities for land drainage and nature conservation (this area is within an SAC) are fully consulted prior to any works taking place.

A more short term approach to improving access on the lower river would be controlling the emergent weed growth mechanically or with the herbicide glyphosate. Again, consultation with the relevant authorities is required.

- Further introduction of gravel could be carried out in certain sections of the river, depending upon the success of improving access for spawning adults. The sections are: between the downstream end of the walled channel below the mill and the bedrock cascade; and in the narrower sections upstream of the mill.

Above the mill, it would be possible to create localised areas of increased water velocity by channel narrowing and introduce gravel in these areas. Probably the easiest way of doing this would be by creating mid-channel islands as described in the *Wild Trout Survival Guide*. A relatively small area of spawning habitat in this section could be of great benefit, as the juvenile trout habitat is excellent. Care should be taken to ensure any works on the section of river above the mill are sympathetic to any conservation interests, and appropriate advice should be sought before any works are carried out.

- Ensure that any plans for the restoration of the mill take account of fish habitat, and restoration work already undertaken. Issues to consider include the backwater effect of restoring the mill pond and sluices; the loss of flow over the restored gravels below the mill if the mill race was reopened; and attraction flows and entrainment/passage of migrating fish (adult and juvenile).

6.0 Making it Happen

- Contact local WRFB staff and find out what has already been done and their thoughts on the value of undertaking further works on Bunnadober in terms of the returns it could generate.
- Involve local angling clubs, WRFB, and OPW in projects. Follow the model of Headford AC with the improvement projects visited on the Corrib tributaries.
- The Wild Trout Trust can provide financial support from the Advisory Visit Bursary or Partnership Fund to match funding from other sources towards habitat improvement projects. More details are available on the website at www.wildtrout.org.

7.0 Disclaimer

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