



Advisory Visit

Ryburn Reservoir, Ripponden

February 2010



1.0 Introduction

This report is the output of a site visit undertaken by Tim Jacklin of the Wild Trout Trust to Ryburn Reservoir on 26th February 2010. Comments in this report are based on observations on the day of the site visit and discussions with committee members of Ripponden Fly Fishing Club (RFFC), www.rippondenflyfishers.co.uk/index.htm.

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 Catchment / Fishery Overview

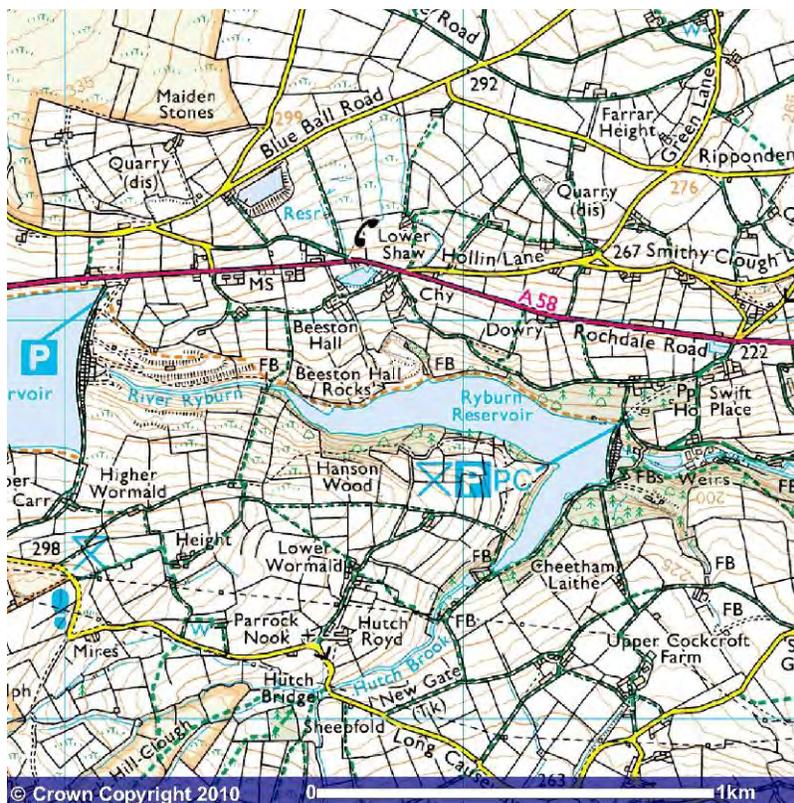


Figure 1 Location of Ryburn Reservoir

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Ryburn Reservoir (completed 1933) is located in the upper reaches of the catchment of the River Ryburn, a tributary of the Yorkshire Calder. The L-shaped reservoir is formed by a dam across the valley at its eastern end, and it is fed by the Hutch Brook (into the southern arm) and the River Ryburn (into the western arm). The latter watercourse is impounded by Baitings Reservoir (completed 1956) about 500 metres upstream (Figure 1).

The reservoirs are located in the southern Pennines on a millstone grit geology, and much of the upstream catchment is blanket bog and heather moorland. Ryburn Reservoir is operated by Yorkshire Water plc and a compensation flow is released into the River Ryburn downstream. According to RFFC this release is a fixed amount, and causes wide seasonal fluctuations in reservoir levels. The idea of having seasonally adjusted releases (i.e. less water released in summer) has been discussed previously, but has met with opposition from anglers who enjoy good quality fishing in the River Ryburn downstream.

The club website describes the history of fish stock management in the reservoir thus:

Ripponden Fly Fishers was first established in 1954 ... Throughout the '60s the Club had a membership of 30 and fishing was for the indigenous wild Brown Trout. However, construction of Baitings Dam upstream of Ryburn together with an increase in membership necessitated a limited stocking of Brown Trout every 2 or 3 seasons.

A doubling of membership over the last quarter century has resulted in stocking becoming an annual event, although the occasional capture of juvenile Brown Trout is a healthy indicator of continued breeding by the indigenous stock.

RFFC currently have 50 members and also sell a few day tickets. Between 400 and 500 brown trout (fertile diploids) are stocked each year, with around 200 being 5"-7", 100 being 9"-11" and 100 being 11"-13". Rod averages are around 2 fish per visit over the seven years to 2004, with catch-and-release being normal practice. Cormorants have become more frequent visitors to the reservoir in recent years and the club has carried out some shooting as an aid to scaring under a licence from DEFRA.

The club would like to increase the production of wild trout within the reservoir, and reduce their reliance on stocking.

3.0 Habitat Assessment

The key to improving wild trout production in the reservoir is improving spawning habitat in the feeder streams. Three streams were inspected.

a) Small tributary in Drumming Wood (north bank)

This feeder stream runs down a steep clough into the reservoir; only a short length (approximately 20 metres) is accessible to fish from the reservoir before impassable cascades are reached. The lower end of the stream has a shale gravel and cobble substrate and trout have been seen spawning in the area previously (Photo 1).

There is potential here to create some gravel spawning habitat by manipulating the shape of the low-flow channel, introducing gravel and fixing low log "weirs" to help retain gravel within the channel (see recommendations).



Photo 1 Small tributary on north bank

b) River Ryburn (western arm)

There is only a short length of the River Ryburn upstream of the reservoir before it is impounded by Baitings Reservoir. The latter was constructed in the late 1950s and will have had severely limited the potential for wild trout production by drowning out spawning habitat, a fact reflected in the historical changes in the club's stocking policy noted above.

The approximately 500 metres of river between the reservoirs is of limited potential for trout spawning for the following reasons:

- There is a considerable amount of iron ochre on the bed of the river, especially in the lower section (Photo 2). Ochre is formed by the oxidation of soluble ferrous iron to insoluble ferric iron, which raises the question of from where in the water column of Baitings Reservoir is water released? Releases from the anoxic hypolimnion (as suggested by the oxidation of iron) cause de-oxygenation and although re-oxygenation is likely to be rapid in a shallow, fast-flowing stream like this, the water quality in the short length to Ryburn Reservoir may be unsuitable for trout and their reproduction. The water quality needs to be assessed before any attempts are made to improve spawning habitat in this tributary.
- The substrate is mostly bedrock which is not suitable as a medium for spawning (Photo 3). Baitings Reservoir prevents the supply of bed load sediment from upstream; it may be possible to introduce cobbles and gravel to compensate for this, although the water release policy from Baitings needs to be determined beforehand. Large discharges could easily displace introduced gravels.



Photo 2 River Ryburn with iron ochre on bed



Photo 3 River Ryburn – mostly a bedrock substrate.

c) Hutch Brook (eastern arm, Parrock Nook)

This tributary runs off moorland to the south-west of Ryburn Reservoir, and the in-stream habitat suggests that it is suitable for wild trout production. Unfortunately it flows over a high dam at its entrance to the reservoir which was probably constructed as a silt trap; this prevents access to the Hutch Brook for trout from the reservoir hence limiting the brook's contribution to trout stocks. Immediately upstream of the dam is a deep accumulation of sediment colonised by trees, and beyond this a steep moorland stream with bedrock cascades (Photos 4-6).



Photo 4 Dam over which the Hutch Brook flows into Ryburn Reservoir



Photo 5 Silt trap above the dam



Photo 6 Hutch brook above the silt trap

4.0 Recommendations

- Find out what is the situation regarding releases of water from Baitings Reservoir into the River Ryburn. Check whether the water quality is suitable to support trout spawning, with particular regard to oxygen levels, pH and temperature. Also check on the rates of release and whether any flushing flows are used which could wash away cobbles and gravel. Yorkshire Water plc may be able to advise on the above.
- Improve spawning conditions by installing some logs to manage depths and substrate composition on the small tributary on the north bank – see Appendix 1 for suggestions.
- Change to stocking infertile triploid brown trout, in line with the Environment Agency's National Trout & Grayling Fisheries Strategy. Infertile trout will not attempt to breed with wild stocks thus eliminating the chance of wild and hatchery fish inter-breeding; the progeny of such interactions are less well-adapted to survival in the wild. Stocking triploids will not affect the quality of angling in the reservoir, but will increase the chance of wild fish reproducing successfully.
- Consider the use of a deep-substrate incubation box as described in the Wild Trout Survival Guide provided during the visit. These gravel-filled boxes are gravity-fed by a head of water, and eyed trout eggs are placed in them to incubate. They provide an advantage because the trout fry tend to be larger than hatchery fish when they emerge, and they are not subject to any of the behavioural modifications associated with hatcheries which can compromise survival in the wild.

It would probably be most practical to use triploid brown trout eggs from a fish farm in the incubator box. The alternatives are to use farm-sourced diploid (fertile) eggs, which has the disadvantage of potentially increasing breeding interactions with wild fish and hence lowering the fitness of the wild population as described above, or to trap and strip wild fish when they run the tributaries to spawn in autumn. The latter course of action has several disadvantages including the effort involved, and the low likelihood of obtaining enough broodstock to prevent inbreeding and comply with the EA guidelines on using wild broodstock. The use of farm-sourced eggs in

the box obviously does not increase wild fish numbers, but it does mimic the “wild trout experience” for anglers by producing quantities of grown-on, well-conditioned fish.

Incubator boxes could be located on one of the tributary streams where a head of water is available, and close to good juvenile habitat (such as the lower section of the River Ryburn just above the reservoir). Alternatively there may be a possibility of locating a box in facilities below the dam and catching the emerging fry for seeding into suitable areas (stream mouths, rocky margins, drowned trees, etc.).



Photo 7 Deep-substrate incubator box (minus lid)



Photo 8 Smaller incubation box constructed from an old sink (again shown without the lid)

5.0 Conclusions

The opportunities for wild trout production on the tributaries of Ryburn Reservoir are very limited. The lengths of river and stream habitat available to trout for spawning are very short because of the presence of Baitings Reservoir dam, the dam on the Hutch Brook and the steep valley sides over which smaller tributaries flow.

Some limited improvements to spawning habitat are possible, but it is unlikely that these will be sufficient to solely support trout stocks for angling as was the case before the construction of Baitings Reservoir. The water quality in the River Ryburn may not be suitable for trout spawning because of the influence of Baitings Reservoir and this should be investigated before any habitat improvements are considered here.

Continued stocking of trout is likely to be necessary to support a fishery at the reservoir, but consideration should be given to incubation boxes as a means of increasing the numbers of fish of a similar angling quality to wild

fish at a relatively low cost. Infertile triploid trout are recommended for both incubation boxes and larger stock fish.

6.0 Making it Happen

The WTT may be able to provide practical assistance with the habitat improvements suggested in Appendix 1 via a Practical Visit. Contact Tim Jacklin to discuss arrangements. Permissions need to be sought from the landowners (presumably Yorkshire Water). Formal consent is unlikely to be required from the Environment Agency, but this should be confirmed prior to any works taking place.

Any changes regarding fish introductions to the reservoir or tributaries should be discussed with the Environment Agency, and written permission is required (Section 30 consent) prior to any stocking (including stocking incubation boxes with eggs).

7.0 Acknowledgement

The Wild Trout Trust would like to thank the Environment Agency for the support that made this visit possible.

8.0 Disclaimer

This report is produced for guidance only and should not be used as a substitute for full professional advice. Accordingly, no liability or responsibility for any loss or damage can be accepted by the Wild Trout Trust as a result of any other person, company or organisation acting, or refraining from acting, upon comments made in this report.

Appendix 1

Suggested improvements to the small tributary on the north bank of the reservoir

As per Figure 2 schematic diagram

- Installation of cross-channel logs with in-stream end set lower than bank end to concentrate flow, as illustrated in the cross section.
- Installation of a line of logs as illustrated. Some of these can be notched underneath to provide cover for trout.
- Narrowing of the channel below the furthest downstream cross-channel log to facilitate passage of fish from the reservoir into the stream. Back-filling behind this is required – ideally with boulders.
- Nailing brushwood (not shown) to the various logs to provide low overhead cover over potential spawning areas, providing security for spawning fish.

The works should help to create areas of deeper water suitable for holding adult fish prior to spawning, and also promote the sorting and retention of gravel substrate suitable for spawning.

Logs to be fixed by drilling and pinning with rebar. Searches for underground utilities should be undertaken prior to ground penetration.

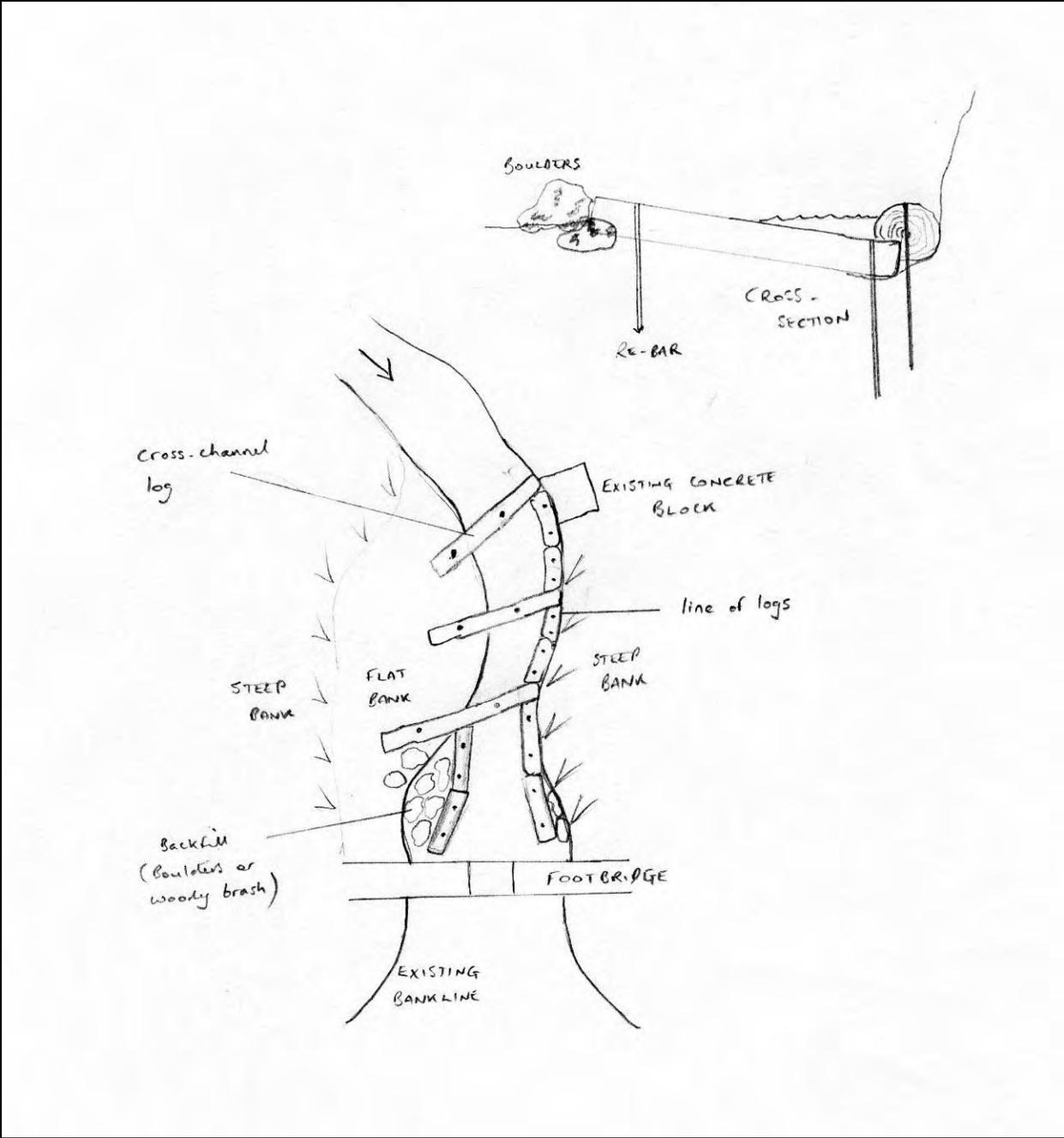


Figure 2