Cinder Hill Fishery, Horsted Keynes.

An Advisory Visit by the Wild Trout Trust April 2014

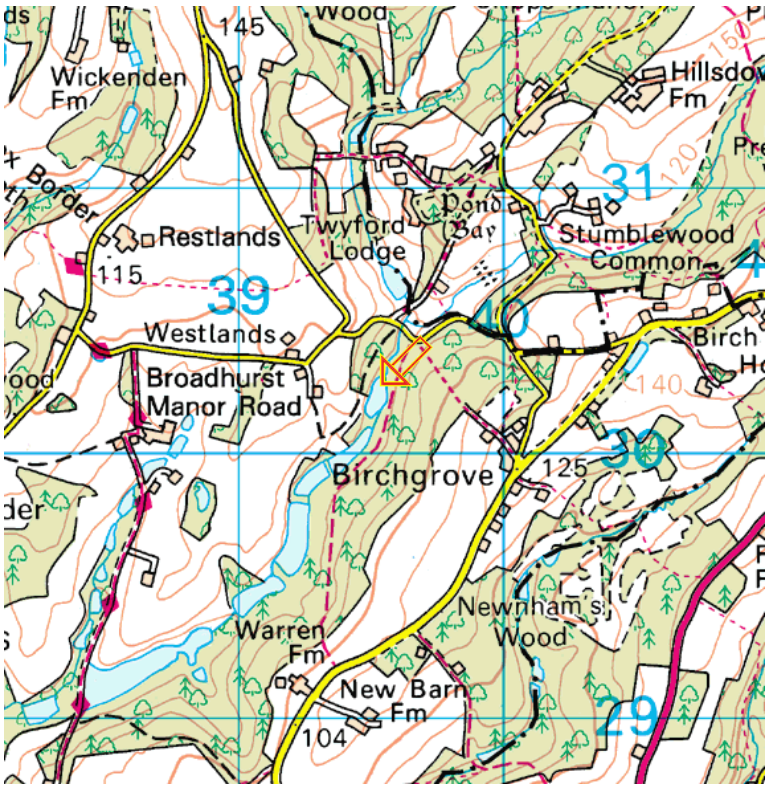
1. Introduction

This report is the output of a site meeting and walk-over survey of the Cinder Hill Trout Fishery, near Horsted Keynes in West Sussex. The fishery comprises a line of on-line lakes formed on one of the headwater streams that comprise the Cockhaise Brook system, which then runs into the the Sussex Ouse.

The request for the visit came from Sam St Pierre who is a long serving Trustee of the Ouse and Adur Rivers Trust (OART) and committee member of the Sussex Branch of the Salmon and Trout Association (S&TA) who helps to run the fishing syndicate at Cinders Hill in association with syndicate members. Joining us on the site visit were Charles Bacchus, Fisheries Technical Specialist with the Environment Agency, Pete King, Project Officer with the OART, Mike Richardson, Syndicate Organiser and Rory Clarke who is the land owner.

The reason for asking for WTT advice was to explore any possible options for developing the small wild brown trout (Salmo trutta) population that is known to in-habitat the feeder stream and the top lake and to discuss options for management and improvement of the fishery as a whole. Currently the syndicate are looking at options for enhancing the top 0.8 Ha lake, which is heavily silted and which the syndicate believes requires significant work if it is to continue to operate as a viable still water trout fishery.

A proposal for restoring the lake has been drafted by Mike Richardson and is attached to this report in Appendix 1.



Cinder Hill Fishery

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.

The contents of this report covers the top lake and a 200m section of the feeder stream running up to the ford on the road crossing at National Grid Reference TQ 396 304.

WB ID: 107041012740.

2. Catchment and fishery overview

The headwater stream that feeds the Cinder Hill Fishery is typical of many of the small streams derived from greensand springs that feed into the Sussex Ouse system. Much of the upper catchment lies on impermeable gault and Wealden clay. These streams have almost spate river characteristics due to the impermeable nature of the local geology and where gradients are steep, the streams are often deeply incised, shaded channels. Spawning opportunities for gravel spawning fish species are often sparse, with species like trout, bullhead (*Cottus gobio*) and brook lamprey (*Lampetra planeri*) spawning on occasional outcrops of eroded sandstone or ironstone.

These streams can suffer from extremely low flows as well as energetic spates which make them a relatively hostile environment for fish at times. That said, most of these small headwater streams support trout populations, with the lower reaches of the Cockhaise Brook also known to be an important site for migratory sea trout spawning. The plethora of structures and impoundments found on many of these streams is often a legacy from medieval iron works. The net result of all the impoundments is that access for migratory species on many of the systems is extremely difficult.

3. Fishery potential and habitat assessment

3.1 Top lake

Occasional wild trout are taken in the top lake. These fish have invariably dropped down from the stream above looking for space and food. The lake itself is not considered to be an ideal environment for wild browns, mainly due to the shallow nature of the lake and the likelihood that water temperatures will climb during long hot spells, potentially adversely impacting dissolved oxygen levels and making cool-water species like brown trout feel decidedly uncomfortable. On the plus side, shallow water tends to be much more productive in promoting a food chain. Maintaining a healthy balance of shallow, biologically rich margins which run up from deeper refuge areas is the key to managing a successful still water trout fishery.

On the top lake the potential adverse impacts of warm water are mitigated by the volume of water passing down the shaded in-let stream. Issues associated

with poor water quality will be linked not only with prevailing weather conditions but also the status of flow available from the stream. Unfortunately a hot July and August following a dry winter and spring could result in a very hostile environment for both wild and any introduced trout.

This top lake in the chain will have provided significant protection to the rest of the fishery from siltation pressures, in-effect it is a large sediment trap. Even if this lake were deemed no longer viable as a fishery, it would still require maintenance work in the long run if it were to continue to function as a sediment trap providing continued protection for the lower chain of lakes. Slowing down the transfer of sediment laden water from the inlet to the outlet will provide a longer settling period and enhanced silt protection for downstream lakes.

Creating greater depth and encouraging the water to circulate will help to increase the turnover and hence settlement time. Removing existing sediment from the lake to create increased depth will also provide a more comfortable environment for both stocked and wild trout. Ideally a still water trout fishery should have at least 25% of it's surface area dug to a depth of in excesses of 3m. This is a very crude estimate and there are plenty of stillwater trout fisheries that do not fit this model and still perform very well.

There is no doubt however, that a deeper and cooler lake will be more resilient when conditions are extreme. Lakes that are fundamentally more resilient to anomalies in temperature are far more likely to perform well as a fishery. An additional benefit of creating deeper water is that it often helps to reduce the amount of submerged weed that will grow vigorously when high levels of light reach the bed.

3.2 Inlet Stream

The impounding nature of the top lake dam influences habitat quality over a considerable length of the stream (photo 1). This wouldn't be so much of an issue if there was free and easy access for small wild fish to migrate up to potentially better quality spawning and nursery sites further up the system. Unfortunately the ford at the head of the reach is not very fish friendly. Under spate conditions it may well be possible for some fish to navigate via the margins but the reality is that the window for successful migration between the lake and upstream of the ford crossing will be limited to very specific flow conditions. The small weir is not a big issue and would soon be drowned out in high flow conditions but the effect of the sloping concrete road will be to generate high flow velocities which are likely to be very problematic, especially for small browns.

Photo 1. Inlet stream approximately 50m above the lake is still heavily impacted by the impounding nature of the lake dam.

Photo 2. Ford at the top of the stream section. Difficult access for trout.

There were one or two sites between the ford and the lake where fish might spawn. Available gravels were on the thin side and it is possible to boost spawning opportunities by recharging sites with a suitable "up-ramp" shape in the bed with imported gravels in the 10-50mm size range.

The stream itself was largely unmanaged and for a spawning and nursery stream it is recommended to leave as much fallen woody material in the channel as possible. The stream itself was quite heavily shaded and although this is also important in helping to keep the stream cool, punching the odd shaft of light into the channel, especially on sections of straight, shallow channel will help to boost productivity. Trees coppiced from the stream bank can be laid into the channel to promote variations in bed topography as well as being used as cover logs. Information on how to effectively use large woody debris to create improved habitat for trout can be found in the WTT habitat manuals which can be downloaded as a file from our website www.wildtrout.org or purchased from our office as a CD ROM.

4. Conclusions

The top lake at Cinder Hill is in need of remedial action if it is to continue to perform as a sediment trap, providing protecting for the lower lakes and performing as a fishery in its own right.

The report produced for the club by Mike Richardson in Appendix 1 sets out a sensible and cost effective approach to de-silting the lake. All silt removal options will be expensive. The best and cheapest solutions invariably revolve around working as much in the dry as possible. Lowering the outfall and draining the lake slowly and creating a narrow managed channel for the stream and then allowing the bed sediments to slowly consolidate is the best option. This may take one full summer. Moving consolidated sediment with a suitable tracked excavator if preferable to wet dredging with a dragline where more displaced sediment will end up in the lake below.

It is understood that suitable areas for storing the dredged sediment have been identified. The further it has to be moved, the more difficult and expensive the job becomes. One option worth considering is to create a bunded area across the top end of the lake to eventually encourage the inlet stream to enter the lake at an acute angle and away from a direct route to the outlet structure.

The area upstream of the bund could form a manageable sediment trap but size matters when it comes to effective settlement areas and regular maintenance is essential to maintain efficiency. Mike has described methods for bund construction. Nicospan would not be our first choice as a revetment material and effective bunds can be constructed from tightly packed faggot bundles with a fine degradable jute geotextile folded in on the inside to collect fines. Straw bales can also be utilised if readily available.

An additional use for dredged material might be to extend out into the lake with small promontories, often a hot spot on rainbow trout fisheries where the fish are constantly on the move. It will be important to maintain shallow margins in many areas but it is possibly to dig the bed down adjacent to potential angling stations to limit weed growth and possibly provide "close-in" action. Small bays

on trout fisheries however are best kept shallow as areas for invertebrate production.

Whatever final design that is chosen, it is obvious that a compromise over the original size of the lake is required in order to create one which will function. It is also worth considering future maintenance requirements and providing good access for a tracked machine to carry out intermediate de-silting at the inlet neck.

On-line lakes are dying from the moment they are constructed and are in essence unsustainable. The transient habitat that often forms when lakes slowly evolve from deep water to shallow bog are often rare and extremely desirable but lakes like these will periodically require significant investment if still to function as a still water trout fishery. The plan tabled by Mike looks to be a very pragmatic and cost effective option.

Wild trout will always drop back looking for space and food. A viable stillwater capable of supporting decent numbers of wild browns will have to be cool and well oxygenated to be viable. The inlet stream will provide wild stock and if some simple spawning enhancements could be coupled with making the top lake a more comfortable environment for trout to inhabit then there is every chance the wild component of the stock will increase and provide occasional sport. We would recommend no brown trout stocking with all captures of browns subject to mandatory catch and release. If stocking with brown trout ceases it will soon become apparent if the wild browns are making a contribution towards the anglers catch returns.

Limiting the size of any rainbow trout stocked into the top lake might also help to give any small wild fish that drop back into the lake an enhanced chance of survival. It is understood that stocking with smaller rainbows might make the stock more vulnerable to cormorant predation pressures.

5. Recommendations

- Implement the recommendations set out in Mike Richardsons report. Any early written pre-development enquiry with both the EA and the local authority is recommended.

- Take the opportunity to dig deeper into the clay bed to a depth of at least 3m over 25% of the new lake area. Use clay won from subsoil augment bunded sections.

- Look upon the lake as an essential sediment trap for the whole fishery.

- On completion of the lake works undertake modest improvements to the inlet stream by punching some holes in the tree canopy and laying woody debris into the channel to promote an improved nursery habitat for brown trout.

- Consider importing a modest quantity of appropriate gravels to recharge potential spawning sites.

- Restrict stocking on the top lake to modest sized rainbows.

- A project where a still water pond/lake is being saved may attract public funding via Land Fill Tax credits or the National Heritage Lottery Fund.

Note: All work within 8m of the top of the bank will require a consultation with the EA and may require a formal written Flood Defence Consent prior to any work being carried out.

Acknowledgement

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Disclaimer