Combe Water – Pincombe Devon

An advisory visit carried out by the Wild Trout Trust – April 2011

1. Introduction

This report is the output of a Wild Trout Trust advisory visit undertaken on the Combe Water which is a second order tributary of the River Exe in Devon. The advisory visit was undertaken at the request of Mr. and Mrs. Tim Houghton, who have recently purchased 1.2km of the Combe Water and approximately 25ha of land, mainly woodland, on the steep sided valley through which the stream flows.

The Houghtons have embarked on an ambitious project in partnership with Pryor and Rickett Silviculture to radically thin out a mature Spruce plantation. The coniferous plantation is currently dominating the landscape and heavily impacting the ecology of the stream and the riparian zone. Works to create access for the heavy machinery necessary to harvest the plantation are well advanced and during the visit we were joined by project manager Mr Bryan Elliott.

Comments in this report are based on observations on the day of the site visit and discussions on the day with Mr. Houghton and Mr. Elliott.

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. Catchment overview

The Combe water is a typical Devon spate stream and rises on the high ground on the western fringes of the middle Exe valley. The stream is a 'second order' stream (i.e. a tributary of a tributary to the main river), flowing for approximately 6km from source to join the Iron Mill Stream before flowing on for a further 4km to join the Exe approximately 5km downstream of Exebridge. Land use in the valley is a mixture of both coniferous and deciduous forestry interspersed with small grazing meadows and occasional arable fields.

The Exe rises high on Exmoor and flows through open moorland until it plunges into a steep wooded valley near Winsford. By the time Tiverton is reached, the valley has widened and from here to the sea the Exe meanders through a broad pastoral vale until it flows into the estuary near Exeter and finally into the sea between Exmouth and Dawlish Warren. At 80 km long, the Exe is the longest river in the south west.

3. Fishery overview

The Combe Water and Iron Mill Stream are probably important spawning and nursery streams for the main River Exe. It is likely that the Combe Water is

rarely fished but small stream fishing for wild brown trout (*Salmo trutta*) is becoming increasingly popular.

During the site inspection several spawning brook lamprey (*Lampetra planeri*) were observed. This species is an Annex 11 protected species under the European Habitats Directive.

Brook Lamprey spawning on the Combe water

Throughout most of its length, the main river Exe supports a good quality trout fishery. The fast flowing, rocky upper reaches abound in fish of modest average size, with average size increasing as the river becomes larger and slower in its middle and lower reaches, where fish approaching a pound feature regularly. The Exe has a good run of salmon (*Salmo salar*) and can produce big catches of summer grilse. Coarse fish can also be found in the lower reaches of the river.

The Exe is reputed to only have a small run of sea trout and grayling (*Thymallus thymallus*) are plentiful in the middle and lower reaches. It is not known if sea trout or salmon utilize the Iron Mill Stream for spawning.

4. Habitat assessment.

Plans to thin out the existing spruce plantation that currently dominates the middle section of stream in particular are of fundamental relevance to the future productivity of the fishery. Some concerns were expressed about the amount of sediment that has already entered the stream just downstream of the new access bridge as a result of the forestry activity. There is no doubt, however, that the stream can never be fully rehabilitated unless efforts are made to clear

substantial quantities of conifers from both sides of the valley and particularly adjacent to the stream itself.

Plans to harvest the trees are well advanced and the access bridge and tracks are now in place ready for the work to begin this year. Some localised impacts due to the mobilisation of soft sediments are inevitable and care should be taken in the planning of the works to avoid periods when the ground conditions are wet and particularly during the trout spawning period from November through to the end of February.

The Combe water supports a full range of habitat suitable for supporting the various life stages of the brown trout. From the bottom boundary upstream, the river supports a good balance of pool, riffle and glide habitat flowing over a substrate of mainly shales, cobbles and occasional large boulders. The bottom section is lined with a variety of broadleafed trees which are currently providing a good balance of dappled light and shade.

A short distance upstream and the balance rapidly changes due to the influence of the coniferous plantation. Research undertaken on a variety of streams suggests that trout are likely to thrive where there is a ratio of approximately 60% shade to 40% available light. Shade on spate streams is critically important, particularly during periods of warm weather and low flow to help attenuate water temperatures. As a broad rule of thumb, maintaining decent amounts of shade over holding pools and allowing adequate light to penetrate onto shallow riffle habitat is a good regime to aim for. Occasional coppicing of some of the broadleafed trees on the bottom section should be considered but it is worth noting that coppiced trees can quickly re-grow into multi stemmed, bushy trees which can rapidly increase, rather than decrease, the amount of shading, especially to a small stream with a narrow channel. Any coppicing undertaken should be seen as a first step in a long-term management regime rather than a one-off exercise.

It is understood that, following the removal of the conifers, planting of native broadleaved trees will follow. Being aware of the need to provide shade over deeper pools and bends and more light on straight riffles will help inform where the optimum sites for planting might be. Classic riverside landscape trees such as ash and alder are recommended as the root systems bind the banks together and provide subsurface cover for fish. A smattering of sallow, thorns and elder are also valuable because they provide low bushy cover at water level which can also provide valuable refuge areas for trout. All trees are important as an external source of terrestrial food items for trout, such as beetles and spiders.

On some sections, whole trees and large branches have dropped into the channel. Large woody debris (LWD) is a general term referring to all wood naturally occurring in streams including branches, stumps and logs. Almost all LWD in streams is derived from trees located within the riparian corridor. Streams with adequate LWD tend to have greater habitat diversity, a natural meandering shape and greater resistance to high water events. Therefore LWD is an essential component of a healthy stream’s ecology and is beneficial as it maintains the diversity of biological communities and physical habitat.

Traditionally, many land managers and riparian owners have treated LWD in streams as a nuisance and have removed it, often with uncertain consequences. This is often unnecessary and harmful: stream clearance can reduce the amount of organic material necessary to support the aquatic food web, remove vital in-stream habitats that fish will utilise for shelter and spawning and reduce the level of erosion resistance provided against high flows. In addition, LWD improves the stream structure by enhancing the substrate and diverting the stream current in such a way that pools and spawning riffles are likely to develop. A stream with a varied substrate and pools and riffles is ideal for benthic (bottom dwelling) organisms as well as for fish species like wild trout.

If a fallen tree is in danger of causing a severe blockage and unacceptable flood risk, or if it is orientated in a way that puts severe erosive pressure on a vulnerable bank then the best course of action is to move it and secure it.

This tree is promoting undershot scour when the stream is in spate and may be responsible for the bank erosion. The tree should be dropped into the channel and trimmed and secured parallel with the toe of the LB where it will provide good habitat and reduce the rate of bank erosion of the LB

Coarse woody debris (CWD) which is made up of smaller brashy material is also an important component of trout habitat. CWD is particularly valuable where it lies in the margins over shallow water and often provides critically important refuge areas for trout fry immediately post gravel emergence where they will be much safer from predators. Trout at all life stages need to have some spatial

separation. If a shallow run is liberally dotted with good sized cobbles then this often helps to provide micro habitats for juvenile trout where they feel safe and not in eye contact with each other. Breaking up the margin of a shallow glide with a bundle of sticks could increase its holding capacity for small trout. Often the fry will take up residence away from the parr and in turn the parr will hold up well away from the adults. Parr will eat fry and adults will eat both.

A good example on the Combe Water of CWD providing some excellent marginal cover ideal for small trout.

LWD promoting pool scour and providing a refuge for adult trout

It is understood that only partial harvesting of conifers will take place in the valley during this first phase of work. If significant tracts of coniferous woodland are to remain on the steep valley sides then it is worth considering blocking up some of the drainage ditches serving the remaining plantation areas. This will help to reduce the rapid run-off rates that can be responsible for acidic flushes, particularly after heavy rain following a prolonged dry spell. Buffering the impacts of acidic run-off from coniferous plantations can lead to significant improvements in stream productivity, as a less acidic environment is more conducive to growth of plants and invertebrates. Research carried out in Wales suggests that planting strips of deciduous trees along contour lines will help intercept surface run off from the slope and allow more water to infiltrate into the soil and ground water. When scaled up this might help small streams to keep flowing through prolonged drought and mitigate against acidic flushes.

Dense stands of conifers on the valley sides highlighting the lack of any significant ground plants which are important for binding in the soil. Acidic sediments flushed into the stream will impact on productivity and limit spawning success.

One possible habitat bottleneck for trout on the Combe water may be the lack of suitable sized gravels for redd (nest) building. It was noticeable that the shale pieces that dominate the substrate are not like conventional gravels in that they are quite flat with mainly large pieces. Small brown trout in a stream like this will be looking for gravel (or similar) substrate in the 10 to 40mm size range. Fallen LWD plays an important role in sorting and grading river bed gravels but long sections of the Combe appeared to lack significant quantities of material in this size range. It may well be the case that there is sufficient material for redds and spawning success rates *do* enable every available niche to be filled with a

wild trout, but if trout densities are low then the lack of suitable spawning substrate might be a contributing factor.

The local Environment Agency or possibly officers from the West Country Rivers Trust might have fishery data available from this stream and making some enquiries might help to shed some light on whether or not this is an issue.

Slate/mudstone bed. Finer material is required for optimum trout spawning success. Finer material is present on some locations, as can be seen from the photograph of the spawning lamprey.

5. Conclusions

The varied channel morphology found throughout the whole reach is ideal for trout and the plans to improve habitat by radically thinning the conifers will be the key to this stream meeting its full potential. The temporary disturbance caused when harvesting the conifers will be well worth the ecological benefits that will undoubtedly be accrued, but care must be taken when undertaking the work to give the stream as much protection as possible. Timing will be crucial and avoiding the sensitive trout spawning season from November to the end of February is highly recommended.

The availability and quantity of suitable sized spawning gravels might be a limiting factor. Fishery survey data may exist for this stream and this should clear up any questions regarding trout recruitment. The stream is unlikely to be able to support large individuals but if the density of fish is low and if there appears to be no obvious size structure to the population (a pyramid structure of lots of little fish, plenty of middle sized fish and a few adults) then it might be

worth investing some time and effort into improving spawning conditions. The retention and installation of LWD within the channel will help to sort the substrate that already exists and may well promote increased spawning success downstream of such sites. It is well worth venturing out in mid November through to Christmas to look for signs of spawning. Getting a feel for the habitats the trout select for spawning will give a better indication of what needs to be done to replicate similar sites with the potential goal of boosting wild trout production.

When fishing it should be remembered that a stream of this size will not sustain regular angling pressure and that catch and release will ensure that a viable spawning stock is available at the end of the season. Taking a handful of fish each year for the pot is sustainable but should be restricted to those fish just over the size limit of 21cm, with any of the largest fish returned as these are the most important fish to pass on their genes to the next generation.

6. Recommendations

- Throw your energy into thinning out as many of your conifers as is practically possible and be very happy in the knowledge that this will bring significant ecological benefit to the Combe Water.

- Where conifers have been removed, implement a replanting scheme of native deciduous trees with shading of pools a priority.

- Leave as much fallen woody material in the channel as possible. If it falls in an undesirable location then move it and secure it. Native deciduous wood is more desirable but softwood brash provides good cover over shallow margins for juvenile trout.

- Undertake an autumn/winter walk-over survey to get a better feel for which sites your fish are using for spawning. Whilst you may not see trout building redds and spawning you will see the resultant piles of shale or gravel with shallow scrapes just upstream.

- Monitor natural debris dams but leave in situ unless severe blockages develop.

- Consider some simple training for monitoring river invertebrates. The River Fly Partnership www.riverflies.org offers training that helps land owners and fishing clubs monitor river water quality. Starting a programme of simple monitoring now will help you to evaluate the potential benefits of thinning out your softwood plantation.

- Contact the EA and the West Country Rivers Trust (Toby Russell) to see if any fishery data for the Combe Water is available.

- If trout densities prove to be low, investigate options for boosting spawning success through the provision of suitably sized spawning substrate at one or two key locations near the top of the beat.

- Only fish the beat lightly and return the biggest fish as potentially the most valuable spawning stock.

It is a legal requirement that some works to the river may require written Environment Agency consent prior to undertaking any works, either in-channel or within 8 metres of the bank. Any modifications to hard defences will require a land drainage consent on any river designated as "main river". Advice can be obtained from the EA's Development Control Officer.

7. Making it happen

There is the possibility that the WTT could help to start an enhancement programme. Physical enhancement works could be kick-started with the assistance of a WTT 'Practical Visit' (PV). PV's typically comprise a 1-3 day visit where approved WTT 'Wet-Work' experts will complete a demonstration plot on the site to be restored. This will enable project leaders and teams to obtain on the ground training regarding the appropriate use of conservation techniques and materials, including Health & Safety, equipment and requirements. This will then give projects the strongest possible start leading to successful completion of aims and objectives.

The WTT can fund the cost of labour (two/ three man team) and materials (max £1800). Recipients will be expected to cover travel and accommodation expenses of the contractor.

There is currently a big demand for practical assistance and the WTT has to prioritise exactly where it can deploy its limited resources. The Trust is always available to provide free advice and help to clubs, syndicates and landowners through guidance and linking them up with others that have had experience in improving trout fisheries.

Acknowledgement

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