Devils Brook - Burlesdon

An advisory visit carried out by the Wild Trout Trust – November 2010

1. Introduction

This report is the output of a Wild Trout Trust advisory visit undertaken on the Devils Brook, which is a tributary of the River Piddle in Dorset. The advisory visit was carried out at the request of Mr Howard Mason. Mr Mason's family own approximately one mile of the stream and farm the adjacent land. Mr Mason is a keen conservationist and is passionate about habitats that support wildfowl and wading birds. He is not looking to develop the stream for commercial fisheries purposes but would like to improve and protect habitat that will promote enhanced populations of wild brown and sea trout (*Salmo trutta*) and allow the family to enjoy occasional fishing.

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

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 Devils Brook rises in the chalk hills above the Dorset villages of Dewlish and Cheselbourne and flows south to join the Piddle on Mr. Mason's land at Burlesdon Farm. The river is characterised by heavily modified channels designed to facilitate a network of water meadow systems.

The River Piddle rises at four major springs near Alton St. Pancras, initially flowing south before turning east at Puddletown and then on towards Poole Harbour, where it joins the River Frome at Wareham. The Piddle enjoys a reputation for being a comparatively natural chalk stream, although like most chalkstreams, the channel has been very extensively modified for milling and and agricultural irrigation. The name "Piddle" is an old English word for marsh or fen and the Devils Brook and Piddle valley support habitats that are particularly important for wading birds.

3. Fishery overview

The Devils Brook is an important wild trout and sea trout spawning and nursery stream. The Piddle itself offers excellent brown trout (*Salmo trutta*) fishing, with occasional salmon (*Salmo salar*) and sea trout, as well as supporting coarse fish in the lower reaches.

The top section of Mr. Mason's beat on the Devils Brook was subject to some innovative work undertaken by the then Game Conservancy Trust (GCT, now Game and Wildlife Conservation Trust, GWCT) who undertook a lengthy study into the impacts of stock fencing on trout populations. Outputs from the findings of this research led to the publication of guidelines promoting the use of stock fencing to protect and improve in-channel habitat.

Despite the Devils Brook's high conservation value it is not thought that is protected with any statutory conservation designations.

4. Habitat assessment.

At the time of the inspection, flows in the stream were quite high following a period of heavy rainfall. An accurate assessment of the abundance and variety of in-channel plants and substrate type was difficult. However, based on observation of bankside vegetation, channel form and flows, it was clear that the stream displays a range of distinctly different habitat types. These are largely a function of the presence or absence of impoundments or hatches, fencing and the natural gradient in each section The Devils Brook is obviously a heavily modified stream. Numerous hatches and impoundments are scattered along its entire length. Some of these historical structures are still used today to push water down irrigation channels designed to flood adjacent meadows. Originally constructed to promote an early flush of grass for the “first bite”, these meadows now form an important conservation resource, particularly for wading birds and wildfowl.

One of the numerous structures to be found on the Devils Brook

Despite the issues associated with fragmented and impounded in-channel habitats, the Devils Brook still supports some extremely good habitat for wild trout of all life stages. The scruffy, and slightly overgrown margins on many

sections are providing a refuge area for fish where they will be free from human disturbance and comparatively safe from avian predation. In the areas where there is considerable marginal tree and shrub growth there are still decent sized open pockets where sunlight will be able to penetrate to the stream bed to create the optimum dappled light and shade habitat so favoured by many species including trout.

Stock fencing which excludes cattle from this lower section has enabled a variety of marginal plants and shrubs to develop

Where fencing has excluded cattle the channel is naturally pinched by the encroaching marginal plants. Although not possible to confirm on the day, it is highly likely that the increased water velocities promoted by the “pinched” channel will have enabled the stream to be self cleansing, promoting runs of fast flowing water over a silt-free, clean gravel bed. This type of habitat is favoured by both adult and juvenile trout.

On some sections, the impounding nature of structures is having an adverse effect on in-channel habitat. Where the meadows are more open and on the sections where the channel gradient is lost through impoundment, the stream is slow-flowing and sluggish. This has led to considerable sediment deposition across the channel which has promoted the growth of thick beds of emergent plants such as burr reed (*Sparganium erectum*).

Marginal fringes of plants such as burr reed and sweet reed grass (*Glyceria maxima*) as well as common sedge (*Carex nigra*) are to be encouraged. These

plants act as superb bank protection and provide cover for fish as well as a refuge for the adult stages of the many invertebrate species that are so important to the ecology of the stream. On streams that are in a state of well balanced equilibrium these plants tend to be found lining the stream margins, collecting sediments around their root systems while at the same time acting as flow deflectors. This keeps central channel areas silt free, often promoting an alternative habitat suitable for valuable submerged aquatic plants such as water crowfoot (*Ranunculus spp*). On some of the lower sections inspected, emergent plants were seen growing right across the channel. When this happens they increase the impounding of water in the stream which encourages further colonisation of these plants.

Burr reed growing in central channel locations.

It is thought that some past land drainage work has exacerbated the amount of sediment that now accumulates in this section. Unfortunately the impounding nature of the sluices will also be responsible for the lack of any sediment transport through the lower section. Some ideas for getting the river channel back into a more sustainable regime are discussed in the conclusions and recommendations section of this report.

The section of channel that runs across the meadow and below the main house is devoid of marginal cover. The section is heavily impounded and the channel primarily dominated by thick stands of burr reed.

Structure responsible for impounding the reach that runs in front of the main farmhouse

A short distance upstream of the farmhouse, the channel changes characteristics again as it lies behind a fence line with a substantial buffer zone. Much of the area on the inside of the fence has turned to scrub, with numerous well established trees. Here the channel appears to be very shaded and it would benefit from some light tree work to punch occasional holes in the canopy. Shade plays a vitally important role on trout streams, helping to keep the river cool during long hot periods of low flow. Some incident light hitting the channel is however essential to promote healthy submerged weed growth and to encourage an abundant invertebrate community. A dappled effect of 60% shade to 40% direct light is a tried and tested formula to aim for.

Upstream of Burlesdon village the stream runs down a long straight channel. Habitat quality for trout here is restricted mainly to adult holding water due to an impounding hatch lying at the bottom of the straight. At the very top end of the reach the stream regains its natural gradient and a delightful shallow riffle sequence was present. This type of habitat is essential on a trout stream and enables spawning fish that might wish to migrate upstream to utilise the shallow gravel glides for winter spawning. The long riffle sequences also offer first class habitat for juvenile trout that look to occupy niches too shallow for larger fish. Maintaining scruffy margins with fallen tree brashings and fronds of dying

marginal annual plants is essential in providing over-wintering cover for juvenile trout.

A long shallow riffle above the adjacent lake. The provision of some marginal brashing or coarse woody debris would make this an ideal habitat for juvenile trout.

Further improvements could be made with the addition of some large woody debris flow deflectors to help promote small pots and pools in the shallow sections. This will help to promote some decent lies for adult trout, either pre-spawning or during the summer and also create some ramps of loose gravel ideal for trout spawning.

Two pieces of LWD configured to form an upstream “V”. Structures like this scour local pots in the shallow bed and promote a clean, loose ramp of gravel downstream.

The last section of channel inspected was above the main road and consisted of an artificially straight channel running through a fairly steep sided valley. The stream had obviously been re-aligned and slightly perched above the valley floor, again to provide a head of water for irrigation. On the day of the visit it was noticeable how much sediment was running down the access road. The road was acting as an arterial drain, bringing in sediment rich water from the arable fields at the top of the valley sides. Intercepting some of this run-off through the construction of some road grips or humps to push the water into adjacent soak-away areas would protect the river from nutrient-rich sediment loads which are not conducive to high quality trout streams.

Track leading down to the Devils Brook acting as an arterial route for sediments running off the arable fields up behind the tree line.

The stream either side of the access road was very straight. Although not observed directly on the day, straight channels also tend to be very uniform in depth and velocity and are unlikely to provide the mix of habitats that are vital to supporting a wild trout population. This reach had been fenced as part of the GCT (now GWCT) study looking into the impacts of stock fencing on trout populations. It was quite surprising how little scrub had developed given that the fencing was carried out over ten years ago. This may be because the buffer zone was fairly narrow and determined grazers could reach – or break – in to graze

the margins. First impressions of this reach suggest that it is ripe for wholesale restoration. Redesigning a meandering channel route that sits in the valley floor would create a much enhanced environment for trout and a wide range of other river and flood plain related species.

The top section of the Devils Brook has been realigned as a “drowning” carrier. The channel is crying out for a more natural channel morphology.

5. Conclusions

The numerous hatches and weirs dotted throughout the length of the Devils Brook have a very substantial impact on in-channel habitat quality for trout. There are difficult choices to be made regarding the management of the hatches. One management option for trout would be to remove all the hatches and let the stream create its own natural plan form based on the topography and substrate. This regime is most likely to create a variety of pools, riffles and glides which will support all life stages of trout. However, it may also lead to management problems especially during very low or high flows, and, particularly on this site, it may not be compatible with the desire to retain open wet meadows for wading birds.

The WTT is an advocate for promoting sustainable systems that benefit all wildlife in the river corridor. Generally if a stream is in good order for trout, all

other wildlife tends to benefit, but water meadow systems such as those on the Devils Brook require a carefully balanced approach. Many chalk streams have similar meadow systems, but on many of these sites the infrastructure to use them has long gone and the outstanding conservation value is often associated with the ecological value of the stream itself, rather than the flood plain. I suspect that for the Devils Brook the reverse is true. The contribution the stream makes to keeping the adjacent meadows in good condition for a variety of bird species in particular cannot be ignored or overlooked. Removing the network of structures would undoubtedly benefit the stream and ultimately its trout population but that is not appropriate on this site. The best solution is to look at ways of improving in-channel habitats with most of the structures in place. If there is scope to remove a particular hatch, or keep certain hatches fully drawn for longer periods then some better quality trout habitat will develop.

In addition to the slowing down of water velocities and the potential silting of available habitats, sluices and weirs often fragment fish populations that would normally move up river to exploit good spawning habitats, with the offspring then dropping back down to take up residence in good quality holding habitats. This natural process can be difficult on streams with lots of structures. Most of the structures inspected at Burlesdon Farm appeared to be passable to adult trout; however, the network of off-takes which push water out of the channel into irrigation ditches may lead to a loss of juvenile trout during downstream migrations. Putting screens onto off-take channels can help to reduce these negative impacts on trout populations but such screens do require maintenance to avoid blockage and further upstream impounding issues.

Particular concern was expressed about the rapid colonisation of burr reed in the channel, particularly in the reach running adjacent to the farm. Beds of emergent reed growing in the marginal areas are to be encouraged. Under these conditions the plants naturally pinch the channel, promoting better quality habitat in central channel locations by helping to quicken the flow. The plants also provide an important habitat for adult life stages of key invertebrates which are a vital component of trout diet. Unfortunately they are not so desirable when large beds grow right across the channel as these will further impound the stream and may accelerate local siltation. The solution is to leave marginal plants in place but grub out beds that grow in central channel locations. This can be hard work and sometimes requires some bespoke tools.

An alternative method is to treat offending plants with an approved herbicide. This should be applied by a qualified operative following a consultation with the Environment Agency. To keep some of the plants in check, it might also be worth considering the introduction of tree trunk flow deflectors to scour away at the plants and also to provide some shade by planting the odd tree. The more open sections of channel would definitely benefit from a programme of tree planting. It is understood that tall trees are undesirable on sites favoured by wading birds. Low scrubby sallows will not provide favoured perches for corvids but will help to promote cooling shade as well as providing improved winter cover and a comfortable lie for trout. Low scrubby trees are particularly valuable on the outside of bends, or overhanging pool habitat.

"The ripper" a simple plough designed to be used with a bank-side winch to grub out undesirable plants.

In the reach upstream of the farmhouse a completely different habitat has developed where a section of heavy tree canopy and tall scrub has developed behind a fenced section. This has resulted in the channel become heavily shaded. Fencing off low, soft chalkstream margins has been widely advocated as a sensible management option to protect vulnerable habitats from cattle damage. This approach only works to the rivers' advantage if there is some occasional maintenance on the inside of the fence line to avoid the stream developing continuous heavy shading. Increasingly river managers are looking at the option of allowing some limited access for light grazing animals behind a much wider buffer zone to create a more ecologically diverse and valuable river corridor. It is accepted that obtaining the ideal scenario is often easier said than done.

Further improvements to trout habitat can be made on some of the shallow riffle sections. The Devils Brook is potentially an important stream for spawning trout and sea trout; however, good quality spawning sites were comparatively sparse. Some good quality spawning habitat was seen on the reach just above the adjacent lake. Potentially more shallow spawning habitat could be created if some selected hatches could be removed or fully drawn.

On the sites where shallow glide and riffle habitat existed, further enhancements can be made by pegging in some large woody debris (LWD) flow deflectors to help scour small holding pots and to throw up ramps of clean loose gravel. Spawning success on many Wessex chalkstreams is compromised due to the impacted nature of the gravels. Flat, silt laden gravels can be difficult for trout to dig redds and often the trout egg to fry survival rates are poor. Putting in a little effort to help sort and clean gravel with simple LWD deflectors can give

spawning success a real boost as well as improving the holding potential of the stream for adult trout. Details of how to use woody debris are set out in the WTT Chalkstream Habitat Manual, available as a free download from www.wildtrout.org

It was also noted that some of the shallow riffles were lacking in marginal cover. Bank-side dead and dying annual plants often lean over into shallow margins and provide important winter cover for juvenile trout. In sections where weed growth is poor and a low scrubby margin non-existent it will pay to introduce a few brash bundles or dropping the odd sapling to create a matrix of branches. This will help to deter avian predators and encourage the trout to take up residence rather than flee downstream.

Brashings pegged into a bare shallow margin providing a refuge for juvenile trout

A quick inspection of the adjacent lake was made. The lake, which receives flow via an inlet channel taken from the stream has been recently de-silted. Significant flow was entering the lake at the time of inspection and it is suggested that throttling flow into the lake at the inlet will slow down the rate at which sediments accumulate within the lake. On-line lakes can adversely impact streams and rivers by elevating water temperatures downstream and promoting the production of algae. Limiting the flow into the lake sufficiently to just hold water level will protect the lake from excessive siltation and reduce any negative impacts on the stream.

A tangled matrix of coarse woody debris pegged over the top of an important spawning site

Pegging in a piece of LWD onto a shallow riffle on the Ebble to promote improved spawning habitat

Any measures taken to reduce the amount of nutrient rich sediment entering the river are to be welcomed. The access road crossing the river upstream of the dual carriageway appears to be a conduit for introducing sediments from the arable meadows that run along to tops of the valley. Exploring options for diverting surface water into large soakaway areas is recommended. Advice might be available from your local Catchment Sensitive Farming officer via the Environment Agency.

The very top section of river inspected looks ripe for a restoration scheme. The river is straight for a long stretch and looked to be comparatively uniform in depth profile. Reprofiling the planform of the stream by creating some kinks and bends as well as promoting some depth diversity will greatly improve its conservation value and provide a much wider variety of habitat niches. There are various methods that could be employed dependant on budget and design constraints. Exploring options for restoring this reach to a much more natural looking and ecologically valuable stream is well worth while. A well designed restoration project might attract some funding from government agencies via a partnership approach, or from other sources. The WTT can advise further on potential project options.

6. Recommendations

- The numerous hatches and weirs dotted throughout the length of the Devils Brook fragment habitats and fish populations. Identifying the purpose and function of each structure will help in developing an overall plan that could protect and improve both riparian and in-channel habitat through a more sensitive programme of hatch control.

- On the more open sections where beds of emergent plants are colonising central channel locations, undertake a programme of selective control. This should include long term plans to avoid recolonisation through the provision of shade via some local tree planting with suitable species (goat willow and thorn) and the installation of LWD flow deflectors to pinch the channel and elevate water local water velocities.

- Where banks have been fenced and long areas of dense, tall scrub have developed, consider clearing or reducing some sections and introducing a management regime of light summer grazing to keep the marginal vegetation in check. Aim to achieve the desired mix of light and shade for the channel and open habitat for birds.

- Where there is excess bank poaching, consider erecting temporary fencing to allow the bank to stabilise. Avoid permanent fencing which might promote heavy scrub. On open sections a mosaic of habitat will help to provide some improved habitat for trout but not deter the wading birds.

- On open shallow riffle sections peg in the occasional piece of LWD to help sort gravels and promote better spawning opportunities.

- Continue with efforts to eradicate non native plants such as Himalyan balsam (*Impatiens glandulifera).*

- Consider installing a drainage system to intercept sediment laden water running down the access road.

- Explore options for a radical in-channel enhancement of the long straight channel near the bottom boundary.

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 you 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

The WTT would like to thank the Environment Agency for supporting the advisory and practical visit programmes.

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.