Whitewool Stream – Meon Springs

An advisory visit carried out by the Wild Trout Trust – January 2013

1. Introduction

This report is the output of a Wild Trout Trust advisory visit undertaken on a 1km section of the Whitewool Stream, a headwater tributary of the River Meon in Hampshire. The reach inspected runs from the outlet of the Meon Springs Trout Fishery at SU652216 downstream to SU649217.

The stream here is owned by the Butler family of Whitewool Farm and the reach inspected exits from a chain of on-line ponds which form the Meon Springs Trout Fishery. This section of the Whitewool stream is at the perennial head of this River Meon tributary.

The request for the visit was made by Mr. Jamie Butler and Mr. Roger Greentree, who helps to run the Meon Springs Fishery. Comments in this report are based on observations on the day of the site visit and discussions with Mr. Greentree.

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 Whitewool Stream forms one of two headwater branches of the River Meon. Both branches rise from the Hampshire chalk aquifer near the village of East Meon and flow south for approximately 37km before entering the sea at Hill Head. The river enjoys a steep gradient for a chalk river, falling approximately 120m from source to sea. The middle and upper reaches of the river flow over deposits of Lower Chalk, which is less permeable than the Upper Chalk geology predominantly found in the rest of East Hampshire. As a result, the Meon tends to have a greater flow range compared to other southern chalk streams. The river at Soberton lies close to a significant change in geology in the Meon Valley. Above Soberton Mill, the Meon runs over chalk; below the Mill, there is a rapid change to deposited material, principally London Clay and Reading Sand. These deposits dominate the Meon catchment south of Soberton Heath until the river enters the sea at Titchfield Haven.

For much of its length, the river displays the classic chalk stream characteristics of clear water, low soft margins and an abundance of in-channel macrophytes dominated by water crowfoot (*Ranunculus* spp.), starwort (*Callitriche* spp.*)* and water moss (*Fontinalis antipyretica).* As with most chalk rivers, the channel is heavily modified and in-channel habitats are heavily influenced by the numerous structures and milling impoundments found throughout its length.

Fishery surveys of the Meon conducted by the Environment Agency (EA) have concluded that the river is "a productive brown trout river". The Meon is also noted for a strong run of sea trout although they are rarely targeted by anglers on this system. Sea trout are known to run upstream of Droxford during wet years and the EA have improved access for migratory fish by improving existing fish passes on the lower river. The river also supports a range of coarse fish, eel and strong populations of brook lamprey and bullhead, both of which are

designated as species of conservation importance under the EU Habitats Directive.

The Meon (Waterbody ID 107042016640) has been assessed as being in 'Good Ecological Condition' under the Water Framework Directive although the river is known to be both over abstracted and over licensed for abstraction under the EA's own Catchment Abstraction Management Plan.

. Meon		
Waterbody ID	GB107042016640	
Waterbody Name	R. Meon	
Management Catchment	East Hampshire	
River Basin District	South East	
Typology Description	Low, Medium, Calcareous	
Hydromorphological Status	Not Designated A/HMWB	
Current Ecological Quality	Good Status	
Current Chemical Quality	Good	
2015 Predicted Ecological Quality	Good Status	
2015 Predicted Chemical Quality	Good	
Overall Risk	At Risk	
Protected Area	Yes	
Number of Measures Listed (waterbody level only)	1	

Summary of WFD information for the River Meon

3. Fishery overview

The Whitewool Stream has not been used as a fishery in its own right. However, there is no doubt that the stream plays an important role in supporting the wider trout population for the River Meon. This small stream is a spawning and nursery stream. Young trout will reside in the stream but as they become larger the majority will naturally drop downstream to exploit viable habitat niches. The management team at the Meon Springs Fishery are keen to explore options to see if the stream can be further developed to provide some low-key wild trout fly fishing opportunities to add to the portfolio of angling opportunities provided by the Meon Springs Fishery.

4. Habitat assessment

It should be noted that the habitat was assessed in the winter following nine months of above average rainfall. As a consequence, flows in the Whitewool Stream were particularly strong.

The stream channel below the bottom pond at Meon springs is initially wide and shallow, before becoming slightly pinched and deeply incised as it bisects the meadows adjacent to the river downstream. The stream channel itself has obviously been extensively modified in the past through dredging and channel realignment (moving the river) and this has negatively impacted the quality of the habitat.

The presence of three online lakes, which form the Meon Springs Trout Fishery, also has an impact on the habitat of the stream. On-line lakes can impact on the quality of stream fisheries and habitat in a number of different ways:

Dams on lakes usually form impassable barriers for fish migration and also can act as downstream traps. Fortunately, there is only a short section of stream flowing above the lakes and as this section is ephemeral, drying up following long periods of below average rainfall, it is not thought to support a viable fish community.

On-line lakes can also impact the stream below by acting as a thermal radiator. During prolonged hot sunny spells the water in the lake will increase in temperature and this will significantly warm the temperatures in the section of stream immediately below. The presence of so much ground water welling up through the system above will reduce the impact of this and hopefully help to keep the temperatures reasonably stable.

On-line lakes and ponds can also interfere with the natural supply of sediments, such as silt and fine gravels. The trapping of silt might be seen as being advantageous for the health of the stream below, however the supply of fine gravels is essential for wild trout spawning. Chalk streams are by nature low energy systems and therefore the gravels found in the stream bed are often extremely stable. Fortunately there was no lack of suitable spawning gravels present in the stream immediately downstream of the lakes, as was evident by the presence of a number of redds spotted on the day. Of particular significance

was one very large redd that could only have been constructed by a large fish and it is suspected that this redd (photo 1) was in all probability dug by spawning sea trout.

The Whitewool tributary is not known as a site for sea trout spawning and it is thought that the very high autumn and early winter flows have enabled some sea trout to penetrate much further up the Meon system than in a normal year. The Meon supports a significant sea trout population, with the majority of spawning activity taking place downstream of Soberton, where the habitat characteristics are particularly favourable for salmonid spawning activity.

Photo 1. Large redd located approximately 100m below the bottom lake. The clays on the river bed give a good indication of scale and this redd was in all probability dug by a sea trout.

All trout, whether resident brown trout or sea trout, will travel upstream in the autumn to look for clean gravels where they can successfully spawn. Trout in the Meon usually spawn in November and December. The eggs hatch and the tiny fish (alevins) live in the gravel at first before migrating downstream a short distance as fry to find shallow water with plenty of cover, usually in the margins. As the trout grow, they gradually move downstream to find well covered riffles or glides, or, in the case of sea trout, they will smoltify, usually as two year olds and go to sea.

Good quality habitat for spawning and juvenile life stages is critical to the overall health of the trout population and the first 200m or so of channel downstream of the lakes provided numerous spawning and nursery opportunities for trout (photo 2 and 3). The channel here is comparatively shallow, with margins tapering up to very shallow, well covered low flow zones which are ideal

habitat for trout fry to live immediately after that have emerged from the gravels. The channel gradient through this top section is comparatively gentle, which helps to support a number of shallow glides, ideal for spawning, interspersed with riffles that provide ideal parr habitats.

Some nice dappled shade is provided by a line of scrubby trees on the LB (photo 4) and this cover may well be adding the value of this top section as a spawning and nursery site.

Safe holding pools for adult trout were at a premium and this represents the main habitat bottleneck for the reach as a whole. The habitat at present is being used by fish that penetrate upstream as far as they can during high flows in the autumn, spawn and immediately drop back downstream. In effect this does mean that the reach is extremely valuable but it will not sustain an adult population throughout the year. It should be noted that, even if the habitat is manipulated to add adult pool habitat, the reach may still not be viable for supporting an adult trout population during periods of below average, or even average rainfall. It will be important to ensure that any changes to holding habitats do not result in ecological damage to the wider trout population through the creation of deep pool habitat that encourages too many fish to stay, rather than dropping back downstream as flows reduce. Adult wild trout sitting in isolated pool habitat with little flow will come under stress and be vulnerable to chronic mortality.

That said, there is a balance that can be struck because at present there is virtually no adult holding water and fish running the stream to spawn will be also be vulnerable to predation and mortality. The creation of improved holding habitat that provides some increased diversity in the river bed profile will enable fish to sit comfortably without crowding into artificially created areas that might form traps as flow shrinks away in the high summer and early autumn period. The creation of more diversity in the shape of the river bed may well provide some limited angling opportunities during the April to end of June period, depending on seasonal flow. Creating this improved habitat will be a difficult balance to achieve and is discussed in more detail in the recommendations section of this report.

Photo 2 shallow glide and riffle habitat, typical of the upper section of the reach. Note, the shallow wet low-flow zones in the margins. An important fry habitat.

Photo 3 Brown trout redds adjacent to well covered shallow margins. Excellent spawning and nursery habitat.

Photo 4. Typical section on the upper half of the reach inspected. The tree cover adjacent to the LB is providing some valuable shading and could be extended further downstream

Further downstream the characteristics of the channel dramatically change (photo 5). Here the channel bisects two arable fields. The gradient of the channel is much steeper and the shallow margins give way to a comparatively steep bank where the channel has been previously re-aligned and lowered. There is a complete absence of any valuable riparian habitat which would normally support a range of chalk stream herbs and emergent plants, which are critically important for sustaining refuge areas for the adult phase of chalkstream invertebrates. The lack of a sizeable buffer zone adjacent to the sloping LB is of particular concern. Due to the shape of the valley, the channel here is particularly susceptible to run-off and diffuse pollution pressures. At the very least, an uncultivated buffer strip adjacent to both margins would make a big difference to the health of the river on this section and would have knock-on benefits for the main river downstream. A possible change in land use to permanent pasture would be a huge contribution towards protecting the river environment.

The in-channel habitat here forms a continuous long riffle habitat, with very little marginal or in-channel cover. Although the section is gravel rich, the channel shape is not conducive to trout spawning and the lack of pools or even micro lies for parr renders this section as a comparatively poor habitat for trout. This section in particular is ripe for enhancement.

Photo 5. Lower section has been extensively modified and is ripe for enhancement.

5. Conclusions

The Whitewool Stream supports some excellent spawning and nursery habitat in the section immediately downstream of the lakes. The section does lack adult holding habitat which might impact on its value as a spawning location in low and average flow seasons. The creation of some adult holding lies could provide some limited low key wild trout angling opportunities. This is best achieved through the introduction of large woody debris flow deflectors and some gentle manipulation of the stream bed.

A low key project to introduce some adult holding habitat in the top half of the section could be achieved using locally won woody material staked into the channel to promote some local bed scour. Deep pools constructed with a machine would be inappropriate at this location and might result in excessive siltation or the trapping of fish during adverse flow conditions. Installing a number of small pots and hollows in the river bed using flow deflectors will increase the adult holding capacity and help to improve spawning opportunities by sorting river bed gravels. See examples in photos 6 to 9.

The lower half of the reach is in poor shape and is ripe for an extensive rehabilitation project. A project designed to create diversity in the shape and form of the channel and provide a meaningful buffer zone to promote an ecologically viable river margin represents an exciting opportunity that may well

attract external funding. The WTT could assist with the production of a formal project proposal that could set out design options and projected costs.

Photos 6 & 7 Single marginal log flow deflectors promoting variations in flow velocities and bed shape

Photo 8. Single section of trunk promoting scour of each end of the deflector

Photo 9 Pair upstream V deflector with gap in the middle. Useful on sections with a steep gradient.

6. Recommendations

- Recognise that the top 200m of channel below the Meon Springs Fishery is a critically important habitat for wild trout during the spawning and juvenile life stages.

- This section of stream will only be viable as a fishery following above average winter rain fall and then only probably for spring and early summer fishing. Any fishing should be for training purposes and restricted to short sessions. Maintaining a wild trout fishery will rely on catch and release tactics being adhered to.

- Consider the creation of some improved adult holding habitat through the installation of some LWD flow deflectors. It is recommended to initially install a maximum of six structures and monitor performance.

- Consider some tree planting with goat willow or thorns to promote some low bushy cover, especially on the low reach.

- Explore options for a change of land use adjacent to the left bank in particular or at the very least the installation of some viable buffer zones.

- Maintain a luxuriant fringe of plants and herbs where ever possible. A light trim to facilitate a cast is acceptable but retain as much low cover as possible. Opening up the section will result in the vast majority of trout vacating the reach.

- Consider the possibility of a more ambitious project to improve the lower section of channel. A way forward is the production of a project proposal that could form the basis of a partnership project, possibly attracting external funding.

It is a legal requirement that some works to the river may require written Environment Agency consent prior to undertaking those 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 a project via a Project Proposal (PP) or a Practical Visit (PV). PV's typically comprise a 1-3 day visit where approved WTT 'Wet-Work' experts will complete a demonstration on the site to be restored. This will enable fishery managers to obtain on the ground training regarding the appropriate techniques and materials required to enhance

trout habitat. This will then give projects the strongest possible start leading to successful completion of aims and objectives.

Recipients will be expected to cover travel and accommodation expenses (if required) of the PV leader.

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 organisations and landowners through guidance and linking them up with others that have had experience in improving river habitat.

Acknowledgement

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

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