



River Meon at Exton



Advisory Visit June 2016

Key Findings

- This section of the upper River Meon has huge scope for enhancement.
- The ecological quality of the reach is heavily impacted by the existing weir impoundment.
- The weir structure may delay spawning migrations but does not act as a complete barrier to upstream migration for large trout, particularly sea trout during high autumn flow conditions. The weir will restrict access for smaller specimens looking to relocate.
- Habitat quality in the short reach downstream of the weir structure is conducive to supporting all life stage stages of brown trout *Salmo trutta*.
- Habitat quality in the longer reach upstream of the weir is compromised by the step in the bed slope resulting in the creation of a smooth, laminar glide habitat flowing over a fine sediment laden river bed.
- Riparian habitat adjacent to both banks is considered to be generally good and conservation objectives for the meadow adjacent to the right bank need to be clearly identified and included in any plans that may result in changes to local water levels.
- Help and support in improving the conservation value of the site as a whole is available from both the Hampshire and Isle of Wight Wildlife Trust and the South Downs National Park Authority.
- Any plans to adjust water levels associated with the weir structure will impact on upstream interests in particular and will require consultation before any changes are implemented.

1.0 Introduction

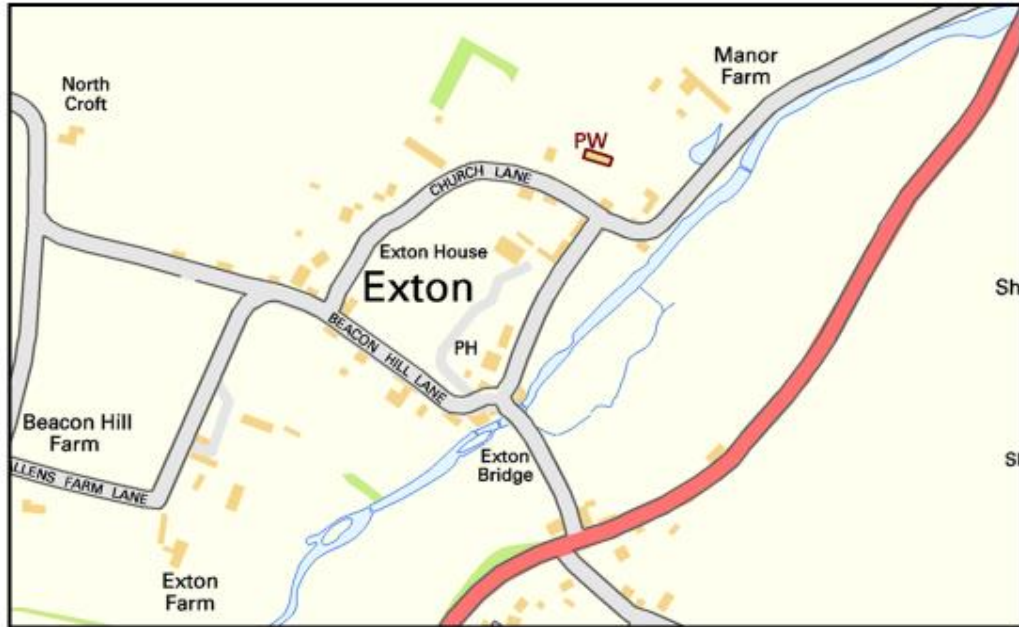
This report is the output of a site visit to a two hundred metre long section of the river Meon in Exton, Hampshire. The request for the visit came from Mr. Maxim Crewe who has recently purchased the property and who now wants to explore opportunities to improve the fishery and conservation value of the river and adjacent meadows.

The top half of this section of river was the subject of an Advisory Visit by the WTT in 2012 (Manor Farm). A copy of the report is available on the WTT website (www.wildtrout.org).

Normal convention is applied with respect to bank identification, i.e. left bank (LB) or right bank (RB) whilst looking downstream. Upstream and downstream references are often abbreviated to u/s and d/s, respectively, for convenience. The Ordnance Survey National Grid Reference system is used for identifying locations.

	River Meon at Exton
River	River Meon
Waterbody Name	River Meon
Waterbody ID	GB107042016640
Management Catchment	East Hampshire
River Basin District	South East
Current Ecological Quality	Poor Status
U/S Grid Ref inspected	SU613209
D/S Grid Ref inspected	SU612208
Length of river inspected	0.2km

Table 1. Overview of the waterbody. Information sourced from <http://environment.data.gov.uk/catchment-planning/WaterBody/GB107042016640>



Map1. Meon at Exton © streetmap

2. Catchment Overview

The River Meon rises from the Hampshire chalk aquifer near the village of East Meon and flows 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.

At Exton (the location of this visit), the river flows over a predominantly chalk geology, but further downstream (near Soberton) glacial deposits of London Clay and Reading Sand become more prominent. 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 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. Sea trout are known to run upstream of Droxford during wet years and the EA have plans to improve access for migratory fish by improving existing fish passes on the lower river. In recent years, a small salmon population has become established in the lower reaches of the Meon, probably as a result of changes to water level control structures located near Titchfield.

The river also supports a range of coarse fish, eel and strong populations of brook lamprey and bullhead which, along with salmon, are designated as species of conservational importance under the EU Habitats Directive.

The Meon (Waterbody ID GB107042016640) has been assessed as being in 'Poor Condition' under the Water Framework Directive (WFD) and the river is known to be both over abstracted and over licensed for abstraction under the EA's own Catchment Abstraction Management Plan.

3. Habitat Assessment.

The fishery can be broadly divided into two sections which are bisected by an old water level control structure located under a footbridge (photos 1 & 2). It is not entirely clear what purpose the weir served but it is possible that the structure was used to build a head of water either for milling power, or possibly for agricultural irrigation. The structure is in very poor condition. Currently there are ad hoc level-control boards situated in the two hatch chambers. These are currently operating at different levels, with the RB chamber having a double impoundment. Access for fish migration via either chamber was considered to be very difficult at the time of inspection.



Photo 1. Access footbridge spanning double weir hatches



Photo 2. Significant head loss in excess of 300mm represents a blockage for all but the largest trout during high water conditions.

In-channel habitat found within the upstream impounded section is dominated by laminar glide habitat, flowing over a predominantly silt-laden river bed. The structure itself has promoted sediment deposition by significantly reducing flow velocities in the upstream reach, evident by the bed level being significantly higher upstream than in the reach downstream of the weir hatches.

It is likely that the channel upstream of the weir has been artificially widened to provide more capacity. There is also evidence that the bank has been raised to create a greater head of water, either for more efficient milling, or to push the water out via off-takes into "drowning" channels located further upstream. Over time, the river has naturally adjusted to the reduced flow by filling the slowest flowing areas with deposited sediment, evident by the banks of soft silt building out from the RB, now supporting beds of emergent aquatic reeds and grasses (cover photo).

Habitat adjacent to the LB is dominated by a line of mixed native trees, including valuable low, scrubby species such as goat willow *Salix caprea* which provide excellent bank protection, as well as cover for fish (photo 3).



Photo 3. Low scrubby cover supplied by marginal tree species adjacent to the LB.

Some additional cover is provided by thin beds of water crowfoot, as well as the odd bed of starwort. Both plants are critically important in providing a refuge for fish, as well as for supporting freshwater shrimp *Gammarus pulex* and the larval stages of many river fly species, synonymous with a high quality chalk stream environment. Conversely, the large patches of bare, fine sediment represent a poor quality environment for fish and the food of fish.

Whilst in several locations the accreted sediments are being colonised by marginal emergent plants, in others the process appears to be slow (photo 4). The transition from wetted channel to dry bank is less defined where the channel is heavily shaded from tall trees growing up from the LB. A combination of allowing in a little more direct sunlight, coupled with planting, will help to accelerate the process of consolidating settled sediment.

Complete weir removal would be the ideal option. If this is not deemed possible then the height of the impoundment should be reduced by pulling out all of the water level control boards. This action would result in the water being pulled through at a much faster rate and at a lower level. Initially the channel will become narrower and even more sediment at the margins will be exposed. Given sufficient light penetration, these areas will soon colonize with a range of chalk stream aquatic plants and herbs. In reducing the height of the impoundment, over time, the bed level will start to drop via the action of increased flow velocity and river-bed scour. Fine sediments currently smothering the bed in central channel locations will be mobilised and the bed will slowly

revert to what should be a clean gravel bed resulting in a much more valuable and healthy river environment. Historic dredging may have resulted in the removal of some gravels but, if necessary, the bed could be restored once a more natural bed slope is recovered by removing the impoundment.

Weir removal will require a consultation with your upstream neighbour and the local Environment Agency. Note that any reduction in upstream water levels will result in drier banks and changes to riparian habitat.

A target species in the River Meon is the water vole *Arvicola amphibius* which had until recently disappeared but is now recovering thanks to a reintroduction project managed by Wildlife Trust, the South Downs National Park Authority (SDNPA) and the Environment Agency. Creating stable and natural river margins is a key objective of the project and help and support may well be available via the project team at the Parks Authority. Contact Elaina Whittaker-Slark at Elaina.Slark@southdowns.gov.uk for more information.



Photo 4. Fine sediment in the RB margin could be consolidated into a soft, vegetated chalk stream margin with a combination of weir lowering, coppicing of dense tree shading and planting.

Downstream of the weir impoundment, the channel is far more natural and dynamic. Deeper pools, shallow runs and riffles, and dense beds of water crowfoot emerging from a clean gravel bed are all evident (photo 5).

At the tail of weir pool itself the channel is relatively wide and shallow, where the left bank has been trampled down by livestock access for drinking (photo 6). Provided the density of animals using the drinking bay is small then this

shouldn't be an issue. Care should be taken to maintain the fence rails and restrict the area of bank available for livestock drinking. This is particularly important if the number, or size of the beasts being able to access the river is increased. Light grazing and even some light bank trampling is not a problem if carefully monitored and managed.



Photo 5. Healthy beds of water crowfoot and a clean gravel bed is evident within the unimpounded section downstream of the weir.



Photo 6. A drink bay adjacent to the LB needs to be managed and maintained to avoid excessive bank damage and over-widening of the channel.

4. Conclusions

The River Meon both upstream and downstream of Exton supports a high quality wild brown trout fishery. Habitat quality in the reach inspected at Exton is compromised by the existing weir impoundment. This particular reach could be dramatically improved by running the upstream water levels lower and providing faster, more diverse flows. It should be recognised that the structure itself may have historical significance. Following a consultation with the EA and your neighbours, removing the weir would be a quick and easy way of dramatically improving the quality of in-channel habitat and opening up the reach above for improved upstream fish migration.

Once the boards have been removed, the river should be given at least a year to settle down to the new level regime before contemplating any further work. Further improvements could then be made by installing natural woody flow deflectors in the reach upstream of the weir to help with the bed scouring process. The key principles here are to squeeze, rather than impound the river flows to help drive the river bed down to create sufficient water depth for adult trout to comfortably lie-up. Creating diversity in the river bed shape and depth, with adjacent overhead cover, and the exposure of a clean gravel bed will create improved opportunities for weed growth, invertebrates and fish, including brown trout. Example photos below (photo 7) of a reach of the River Wandle where

weir removal was recently undertaken clearly demonstrates how natural channel characteristics can be restored following the removal of a weir structure.



Photo 7. Before and after photos of the River Wandle at Butterhill following weir removal

Woody material could be easily won from the LB margin which will also provide improved light penetration to areas of the RB margin, in turn helping to promote improved plant growth on the exposed bank sediments. Tree work should be restricted to small and medium sized trees rather than any of the mature landscape trees. A 50% dappled light versus shade regime is considered to be an ideal mix to aim for.

Further information on the use of woody material flow deflectors to promote bed scour and the sorting of bed sediments, as well as the use of brushwood to help stabilize soft margins is available on our website. More detailed information can also be obtained from our Chalkstream Habitat Manual, available as a pdf from the website, or as CD via the WTT Office.

5. Recommendations

- Meet up with your upstream neighbours to discuss the idea of removing all the weir structure.
- Recognise that for the first year or so the channel will look different, as the process of recovery is not instant.

- Offer to work with your upstream neighbour to ensure that the increased flow velocities won via the removal/lowering of the weir can be harnessed to help promote bed scour and improved opportunities for weed growth, invertebrates and wild trout.
- Engage with the River Meon Partnership via the SDNPA to contribute towards improving habitat on the river for wildlife. This group is a valuable source of information and support and they can help you to look after your section of the Meon.
- Coppice occasional clumps of trees on the LB (south bank) to encourage improved light penetration to exposed bank sediments on the RB.
- Accelerate the recovery of exposed sediments on the RB margin by thinning and then replanting emergent reeds and grasses from those areas where recovery is well underway.
- Access across soft RB margins can be created by either constructing a few simple low level board walks, or by importing a simple narrow bunds of gravel. Any access path should be restricted to two or three spines leading to the river's edge, rather than a formal path running parallel with the river. The construction of any access point should be as low and as narrow as possible.
- Introduce woody material to the channel to promote bed scour/sorting and provide cover. Use large woody material to promote bed scour, parallel cover logs for adult trout cover, and brushwood to help stabilise the RB margin and provide micro habitat for small fish.
- Monitor the levels of meadow grazing on the reach downstream of the weir and do not allow unfettered access for grazing to the whole reach.
- As the watercourse is classed as 'main river', any work within 8m of the top of the river bank will require a consultation with the Environment Agency and quite possibly a permit for work.
- Consider attending a training course in river-fly monitoring. This will potentially enable some self-monitoring of local water quality via a simple assessment of the presence or absence of key aquatic invertebrates. For further information visit www.riverflies.org

6. Making it Happen

The WTT can provide further assistance to help implement the above recommendations. This includes help in preparing a project proposal with more detailed information on design, costs and information required for obtaining consents to carry out the works. If required, a practical visit can be arranged to demonstrate habitat improvement techniques. Demand for these services is currently high but WTT is able to provide further advice and information as

required. Further advice on fund-raising can be found at www.wildtrout.org/content/project-funding

We have produced a 70 minute DVD called 'Rivers: Working for Wild Trout' which graphically illustrates the challenges of managing river habitat for wild trout, with examples of good and poor habitat and practical demonstrations of habitat improvement. Additional sections of film cover key topics in greater depth, such as woody debris, enhancing fish stocks and managing invasive species.

The DVD is available to buy for £10.00 from our website shop www.wildtrout.org/product/rivers-working-wild-trout-dvd-0 or by calling the WTT office on 02392 570985.

The WTT website library has a wide range of materials in video and PDF format on habitat management and improvement: www.wildtrout.org/content/index

7. Acknowledgement

The Wild Trout Trust would like to thank the Environment Agency for their continued support of the advisory visit service.

8. Disclaimer

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