Itchen - Yavington

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

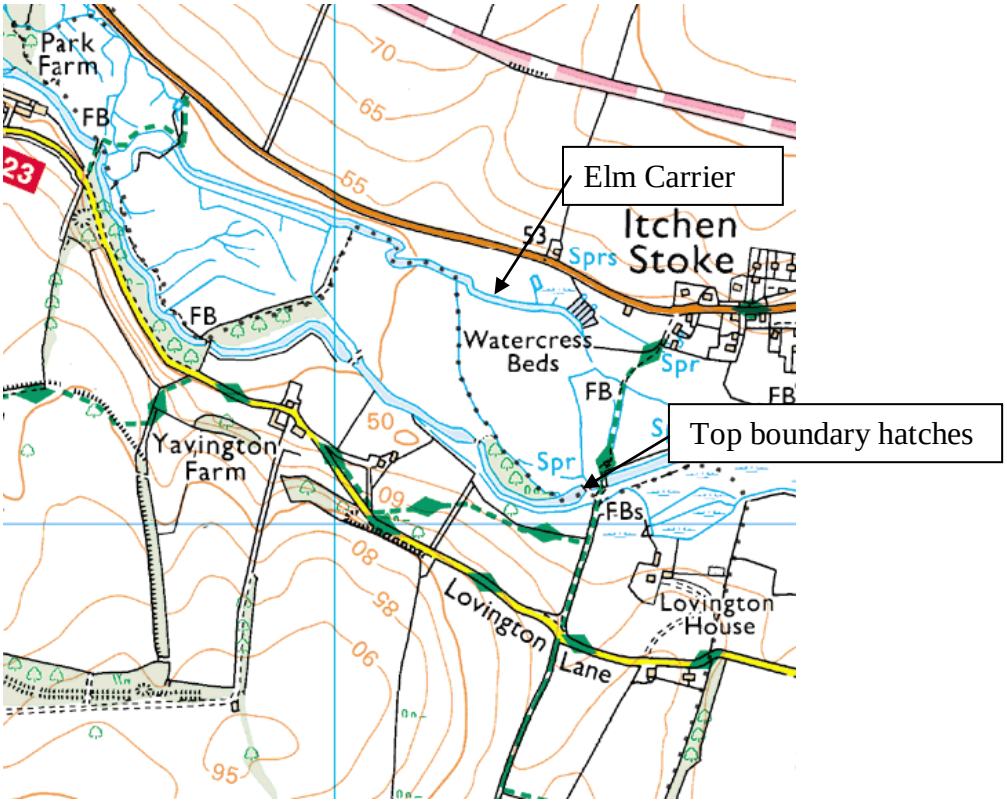
1. Introduction

This report is the output of a Wild Trout Trust Advisory Visit (AV) undertaken on a section of main river and carrier to the River Itchen at Yavington Farm in Hampshire. The sections of river inspected (Map 1) included a section of the Elm Carrier (single left bank) at National Grid Reference (NGR) SU 548 325 and the main river from the top boundary at SU 550 323, down to the bridge which is located approximately in the middle of the main river beat.

The request for the visit was made by Mrs. Vicky Reed, who is a co-owner of the fishery. Comments in this report are based on observations on the day of the site visit and discussions with Mrs. Reed and Mr. Jumbo Fuller, who also owns rights to the fishery.

The main reason for seeking WTT advice on the fishery was to discuss the condition of the carrier, where the banks have encroached and become narrower in recent years.

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.



Map 1 River Itchen at Yavington

2. Catchment overview

The River Itchen is considered to be one of the finest examples of a chalk river in Europe and one of the most famous brown trout fisheries in the world. The river is designated as a Special Area of Conservation (SAC) and a Site of Special Scientific Interest (SSSI).

The Itchen rises from the chalk aquifer to the east of Winchester where groundwater springs feed into three headwater streams: the Alre, the Candover and the Tichbourne, or Cheriton Stream. The streams converge near Alresford and flow south west, through the centre of Winchester and on to join the sea in Southampton.

The river is characterised by a plethora of man-made channels, some dug to provide milling power, some to support the old Itchen Navigation and others to feed the network of water meadow carriers.

The River Itchen is classified as a heavily modified water body under the Water Framework Directive. Currently the river is failing to meet targets set under the Environment Agency's River Basin Management Plans.

River Itchen	
Waterbody ID	GB107042022580
Waterbody Name	River Itchen
Management Catchment	Test and Itchen
River Basin District	South East
Typology Description	Low, Medium, Calcareous
Hydromorphological Status	Heavily Modified
Current Ecological Quality	Poor Potential
Current Chemical Quality	Fail
2015 Predicted Ecological Quality	Poor Potential
2015 Predicted Chemical Quality	Fail

Overall Risk	At Risk
Protected Area	Yes
Number of Measures Listed (waterbody level only)	32

Table taken from the EA website

3. Flow splits and habitat assessment

3.1 Flow splits and structures

The habitat quality within the River Itchen is mainly determined by flow, channel morphology, local geology, river bed gradient and local river maintenance regimes.

The majority of channels which form the River Itchen are man-made and vary enormously in terms of habitat quality. Many of the habitats which support the SSSI are associated with high water levels maintaining comparatively damp riparian habitats, whereas some of the key features of interest cited under the SAC are very much dependant on flow velocities within the channel. High quality in-channel habitats require the river to run low and fast in order to achieve favourable conditions. Chalk streams that have more variety in channel shape and form (pools, riffles and glides) provide more valuable wild trout habitat than long sections of impounded channel, usually characterised by smooth glides with laminar flows.

Striking the right balance to ensure that water velocities are maintained to protect and enhance habitat is often challenging, especially when the flow is split between several channels. This is even more important when the water flowing through those channels is also used for a variety of activities such as cress farming, fish farming and sustaining commercial recreational fisheries.

On some sections of the Itchen and Test there are legal covenants which determine the quantity of flow to be shared between conjoining channels, where the flow split is usually controlled by structures (hatches) operated under strict conditions, sometimes to a fixed water level mark on one, or both channels.

Some of the water level control structures on the Itchen have been assessed as part of a EA's Water Level Management Plan (WLMP), which identifies the key structures and their operation to ensure the protection and improvement of designated sites. It is not known if the River Itchen at Yavington and associated water-level control structures have been included in the WLMP.

On many other sections of the Test and Itchen, where formal arrangements are not in place, the operation of water level structures is purely down to the goodwill of the owner in consultation with their neighbours. This arrangement does seem to work remarkably well, perhaps in part due to agreements brokered

by the Test and Itchen Association. However, the potential for conflict is always present.

There are three aspects of hatch management to consider:

1. The downstream impact which results from the way that flows are split between channels
2. The upstream impact caused by the impounding effect of the hatch
3. The impact of the hatch structure on fish migration.

These three aspects are considered in turn below:

1. Downstream flow splits between channels

The water level control structure (photo on page 1) located just above the fishery top boundary could be repaired and used to manipulate the flow splits between the main channel and Elm Carrier. Additional flow tuning could also be available via the single hatch located at the head of the Elm Carrier (photo 1; below).

At present all of the structures are non-operable. As such, the split of flows between the main channel and the Elm Stream has been stable for several years. Flows and associated habitat have, consequently, responded to the annual and seasonal patterns in rainfall and river discharge, rather than the action of an individual river keeper or land owner.

Photo 1. Single undershot hatch at the head of the Elm Stream. A barrier to fish migration.

2. Upstream impoundment

In addition to setting the flow split regime, the hatch settings will also determine upstream water levels. While the height of the upstream water levels may not be having any adverse impacts on habitat quality within the Yavington beat, the impounding-nature of the structures will have implications for habitat quality upstream, effectively increasing water levels and slowing water velocity.

The upstream reach is owned by the Grange Estate with fishing rights now let to The Piscatorial Society. Removing one, several, or all of the permanently down hatch gates will draw the water through faster and reduce water levels on the reach above, potentially creating improved conditions for trout production. Increasing water velocities on the reach above could also result in improved water crowfoot (*Ranunculus* spp.*)* growth which provides important habitat for several important river fly species. Any improvements in habitat quality in the reach above will have knock-on benefits for the Yavington Fishery below as increased trout populations upstream will mean greater downstream drift of trout seeking lies below.

3. Fish migration

Currently the main hatches would not appear to represent a major impediment to the upstream migration of large salmonids. The structure may, however, limit small trout migration, as well as posing a significant barrier to eel migration. The side hatch on the Elm Carrier is even more problematic, due to the high velocities of water passing under the gate. Improving fish migration both up and downstream through these structures could provide significant benefit for both fisheries as well as the upper Itchen as a whole.

If removing any of these hatch gates were to be contemplated then a corresponding removal of the gate which regulates flow into the Elm Carrier would also be required. It is believed that there are licensed abstractions taking water directly from the Elm Carrier further down, which brings certain rights for an undiminished supply of water via this route for the licence holders.

An early discussion with the upstream interests is therefore recommended so that some joint objectives can be identified and hopefully some beneficial action taken. A possible option to discuss could be asking the EA to measure the current flow split with a view to completely removing the hatch gate at the head of the Elm Stream and then fine tuning the gates on the main channel until the current flow split ratio is met. This action could substantially improve wild trout recruitment in the section immediately upstream of the Yavington beat, potentially providing increased numbers of wild trout for both the main fishery below and the Elm Stream. A consultation with Natural England and the EA is essential.

3.2 Habitat quality

3.2.1 Main channel.

The main channel supports some excellent quality habitat for trout. The channel is not impounded and has a varied planform and bed topography, providing habitat opportunities for all trout life stages. The maintenance regime appears to be sympathetic to the environment and there were good examples (photo 2) of marginal sallows (*Salix caprea)* being allowed to trail into the river, providing valuable cover for fish from predators. A healthy wide fringe has been left over the winter to also provide cover in the crucially important shallow marginal zones.

The provision of winter cover is a particularly important aspect of ensuring good survival rates in a wild trout population. Leaving the river in a "scruffy condition" will benefit trout, invertebrates and other wildlife even if casting becomes slightly more challenging in the spring. A spring-time tidy up to facilitate angling access is preferable to the traditional heavy autumn strimming.

Photo 2. A good example of a well managed section of channel at Yavington

One possible action is to consider introducing more "brashy" cover into areas not necessarily associated with an adult trout lie. This will ensure improved winter survival for juvenile trout, at a time when the cover from plants can sometimes be thin. A particularly important area is the very shallow margins (Photo 3) where the flow velocities are slow. These areas are often at a premium in chalk streams, where man-made banks are often vertical and drop straight into comparatively fast flowing deeper water – a hostile environment for a small fish.

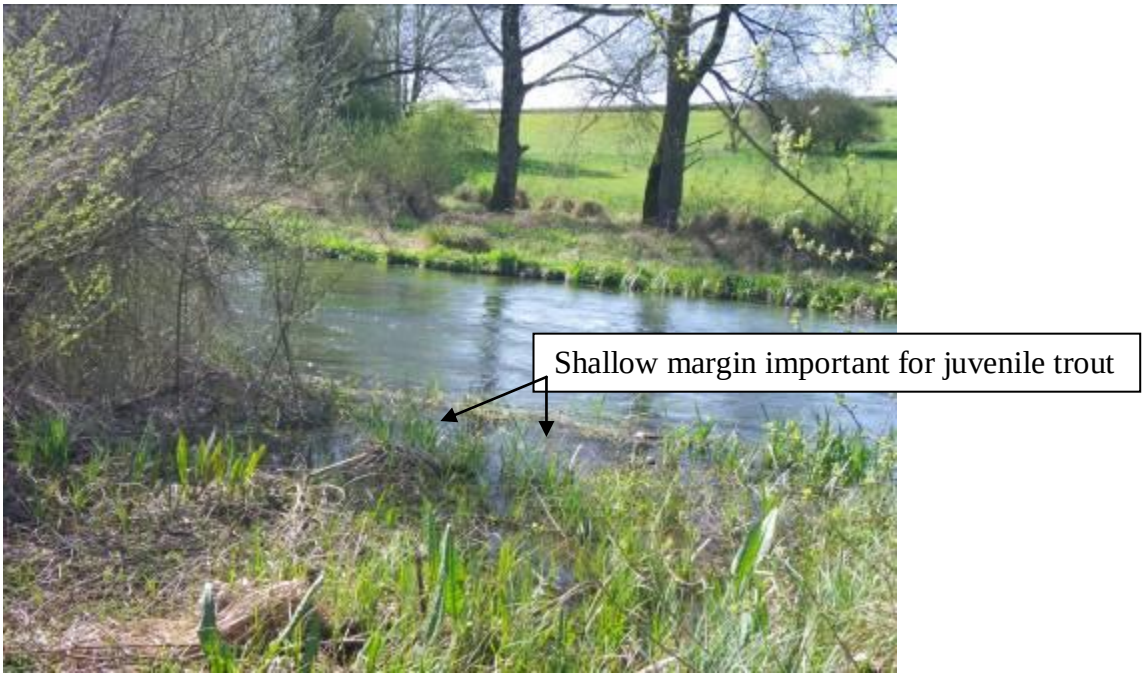


Photo 3. Shallow margins can be further improved by laying down tree brash and pegging it in place to provide improved winter cover

3.2.2 Elm Carrier

It is understood that the Elm Carrier has slowly become narrower in recent years and one of the main reasons for the request for advice was to identify the possible causes and explore options for how this stream can be improved in the future.

From the limited inspection undertaken, it would seem that this carrier was originally constructed as a high level "drowning" carrier, used to provide a head of water to flood the meadows to promote early spring grass growth. This carrier, like many others in the valley, has little gradient and is impounded. It lacks many of the features normally associated with a natural channel that would run through the bottom of a valley. That said, the Elm Carrier, like other Itchen carriers, supports some good habitat for fish. I understand from reports received from the Grange Estate, who fish the opposite RB, that the Elm Carrier has a reputation for supporting the occasional very large wild trout and substantial numbers of large grayling (*Thymallus thymallus)*.

The Elm Carrier is very different in character to the main river channel, with the stream having a lower gradient and consequently slower flow velocities compared to the main channel. The lack of gradient is also exacerbated by the greater length of the carrier channel, which compared to the main channel flows over a much longer distance down the valley slope.

The channel is characterised by slow flowing glide habitat running over a mainly soft silt and thin gravel river bed. In-channel macrophytes are dominated by emergent plants such as Reedmace (*Typha* sp.) Norfolk reed (*Phragmites australis*), reed canary grass (*Phalaris arundinacea)* and Reed sweet grass (*Glyceria maxima)* as well as the occasional Greater tussock sedge (*Carex paniculata)* a particularly attractive and valuable feature in the landscape.

Chalk stream carrier channels such as the Elm Carrier will change shape in response to prevailing flow conditions. Although some emergent reeds and grasses will grow in the middle of the channel, they are better adapted to the slower flowing channel margins. When flow velocities increase they are usually out-competed by flow loving plants such as water crowfoot, water milfoil (*Myriophyllum* sp.) and water parsnip (*Berula* sp.). When flow drops away below the long-term average for a year, or possibly two, then the emergent reed fringe will encroach out into the channel. The amount of flow entering the Elm Carrier will therefore have a big impact on how wide the wetted channel will be.

One option for restricting reed encroachment is to introduce more shading from bankside trees particularly over deeper sections. Planting the occasional low scrubby tree such as the previously mentioned sallow, or hawthorn (*Crataegus oxyacantha)*, will provide wonderful winter cover for fish and help to restrict the encroachment of reeds.

River channels achieve a balance over time, which is reflected in the width and depth of the channel and the plants it supports, and if hatches are raised or lowered, this will alter the status quo above and below. For a given quantity of water, a steeper, narrower channel will support faster flows and flow loving plants. Any impoundment or structure downstream will have a 'backing up' effect, increasing the water level and slowing down the flow. This is likely to encourage the encroachment of emergent reeds and grasses. Given the finite amount of water available and the low gradient of the Elm Carrier, there is a balance to be struck between supporting flow loving plants, invertebrates and fish in the main channel and keeping an open channel of appropriate width in the Elm Carrier. The status quo in terms of flow spilt ratios would seem to be the best long term option, but with the hatches lowered to improve upstream habitat.

Photo 4. Typical section of the Elm Stream where reeds will encroach into the channel if the flows drop away.

4. Conclusions

The Elm Carrier has probably encroached due to a slight reduction in long term flow velocities. This might be due to changes in the operation and management of structures downstream, or subtle changes to the hatch at the head of the Elm Stream. The encroachment might also simply be a lagged response to the severe winter drought of 2010/11. Recent flows have been near, or above the long term average and it is highly unlikely that the channel will continue to get narrower given the current flow split arrangement.

There are significant habitat improvement opportunities available for both the main river and the Elm Stream from reducing the impounding effects of the derelict hatches. As these structures are both under the ownership and control of the Grange Estate it is recommended that a meeting is convened to discuss the options.

If all landowners and tenants agree that there is indeed some scope to locally improve habitat and fish migration then it is recommended to ask the EA to liaise with Natural England over the assessment of current flow splits with a view to formalising the existing ratio but with reduced impoundments. This could represent a significant environmental enhancement and might attract external support. The WTT is prepared to help broker an agreement.

Further control of reed encroachment on the Elm Stream could be achieved via the introduction of some marginal shade. Planting the occasional clump of thorn

or sallow will create diversity in the bank-side habitat and introduce valuable summer shade and winter cover.

The main channel is well managed. The provision of more rough "brashy" cover, particularly into shallow margins will improve overwintering juvenile trout survival.

5. Recommendations

- Share the thoughts and suggestions highlighted in this report with the Piscatorial Society and the Grange Estate to possibly consider some future changes to the water level control structures. If there is a consensus that potentially reducing the water levels has benefits for both parties then consult with the EA and Natural England.

- Provided there is broad agreement, ask the EA if they would be prepared to measure the current flow split with a view to maintaining the current ratio but with increased capacity at both structures to reduce upstream water levels.

- Consider the option of introducing blocks of low, overhanging tree shading on the Elm Carrier.

- Introduce more tangled brash cover over shallow margins on the main channel by laying down live willow, or introducing tethered bundles of brash.

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 Flood and Coastal Risk Management 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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