



**ADVISORY VISIT TO THE KINGSTON
MAURWARD FISHERY, RIVER FROME,
DORSET
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WINDRUSH AEC LTD, ON BEHALF OF DUNCAN
RUSH
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1.0 Introduction

This report is based on a visit to the Kingston Maurward fishery, River Frome, on the 29th April in the company of the fishery owner Mr Duncan Rush, and Mr John Aplin, river keeper to the Dorchester Angling Association, which controls some of the opposite bank of the main River Frome. The visit was sponsored by Orvis as part of their continued support for the preservation and restoration of wild trout fisheries in the UK.

2.0 Fishery Description

The Kingston Maurward fishery comprised of sections of double and single bank fishing on the main River Frome, along with lengths of 3 significant carriers. The River Frome has been designated as a Site of Special Scientific Interest (SSSI) by English Nature (EN), providing it with a degree of statutory protection, but also placing constraints upon permitted river management.

Upstream of the right hand channel roadbridge, the river had been heavily modified by past dredging, with steep banks and, in places, a relatively uniform section. Dorchester AA had planned the construction of three short lengths of gravel riffle using imported gravel, and a series of upstream facing groynes. Consent for these had been obtained from English Nature and the Environment Agency. 6m wide buffer strips had been negotiated on both sides of the river, not only creating a valuable uncultivated area adjacent to the river, but also allowing for the planting of additional riparian trees. There were some stands of actively growing water crowfoot *Ranunculus* Spp in this reach.

The main river downstream of the road bridge was some 8m to 12m wide. There was some slight turbidity in the water following recent rain. This is understood to be typical of the Frome, and reflects the impact of the surface water component on what is primarily a chalk aquifer derived watercourse.

There was an abundance of gravel of a suitable size range for both brown trout *Salmo trutta* and Atlantic salmon *Salmo salar* spawning. Small numbers of the latter species still migrate to this reach of the Frome and spawn successfully. The river gradient was moderate, with lengths of shallow and deep glide, providing habitat for juvenile and adult brown trout respectively.

Small patches of water crowfoot were present throughout the reach. However, growth of this species was generally not as strong as on other reaches of the river locally. Willow moss *Fontinalis antipyretica* was present at locations throughout the reach.

There was a generally well-developed marginal fringe, with a diverse and abundant mix of emergent aquatic vegetation. A substantial buffer strip (3-6m in width) had been purchased and was being fenced against agricultural stock along the length of the fishery.

A carrier discharged from the RB of the main river upstream of the large iron sluices at Bhopston Farm. This carrier was some 1m–4m in width, with a depth of between 25cm and 1m. The bed was dominated by clean gravel suitably sized for spawning brown trout. Extensive beds of reed sweet grass *Glyceria maxima* provided overhanging cover on both banks, ideal for juvenile trout. There was a lack of large woody debris (LWD) generally in the fishery and particularly in this carrier.



RB carrier showing well developed fringe of emergent vegetation and lack of LWD

A section of old river narrowing was present downstream of Bockhampton Roadbridge. The faggot infill had been washed out, leaving only the outline of the narrowing delineated by driven stakes.



Remains of previous river narrowing

Upstream of Bockhampton Bridge, there were good stands of mixed submerged vegetation, including water crowfoot, starwort *Callitriche* Spp., water dropwort *Oenanthe* Spp. and lesser water-parsnip *Berula erecta*. Both banks were well vegetated with no apparent problems from grazing agricultural stock. A network of carriers fed into the main river. These carriers were formed by the divergence of flows from a single carrier towards the western extremity of the fishery.

The LB carrier had a very straightened and modified planform that ran alongside a public footpath. The gradient of the channel was steep, with extensive riffles and shallow glides. The substrate was dominated by clean, moderately well sorted gravel, with associated stands of water crowfoot, water forget me not *Myosotis scorpioides* and water-cress *Rorippa nasturtium-aquaticum*. The banks were steep, with concrete reveted edges on the RB and a fringe of dense riparian trees on the LB. It is likely that the carrier had significant value as a fish spawning and nursery area, particularly for brown trout.



LB carrier upstream of Bockhampton Bridge

The RB carrier was a longer, more sinusoidal channel, with a consequently generally less steep gradient, but more natural appearance than the LB carrier. Both banks were fenced, allowing for extensive growth of marginal vegetation, with associated cover for juvenile trout. Channel width varied from 1m – 3m+. There were good sections of suitable sized gravel for brown trout spawning, with some small stands of water crowfoot also present. A water vole *Arvicola terrestris* was noted on this channel during the site visit.



Typical length of the LB carrier showing fencing

Water quality was believed to be generally excellent in the river, with a diverse range of macroinvertebrates present, including pollution sensitive species such as grannom *Brachycentrus subnubilis* and mayfly *Ephemera danica*. Adults of both of these species were seen hatching during the site visit.

3.0 Fish stocks

The River Frome supports a good stock of wild brown trout, with moderate recruitment in the reaches walked. There is also a stock of grayling *Thymallus thymallus*, with large individual specimens (>1kg) recorded.

Some stocking has been undertaken in the past. The present owner has an aspiration to manage the fishery on a wild stock, catch and release basis.

4.0 Recommendations

- The carrier that discharged from the RB of the river upstream of Bhompston sluices appeared generally ideal for brown trout spawning and subsequent recruitment of juveniles. However, improvement to the stream could be achieved by gravel cleaning of selected reaches annually on a rotational basis (see below). In addition, the deliberate retention and addition of Large Woody Debris (LWD) to the channel would improve the diversity of bed form and the sorting of substrate to the benefit of spawning and juvenile salmonids. Other benefits of LWD include:

- An increase in both mean flow depth and velocity and variability of both parameters.
- The development of high physical habitat diversity both in-channel and in the floodplain. Removal of LWD reduces both habitat quality and availability for juvenile and adult brown trout.
- LWD has significant benefits to the control of run-off at the catchment scale.
- River and riparian management has important effects on the distribution and character of dead wood accumulation within the river system.

Although there are certain situations that may require wood removal to eliminate stream blockage, the wisest management is generally no management. Building on this simple truism, it is recommended that before any future work to remove LWD from river channels is undertaken, the wider implications of the proposal on the whole river system are considered. In addition, the impact of planned riparian tree work on the supply of LWD to the river should be considered. In some circumstances, it may be beneficial to allow trees to fall into the channel, provided the risk of increased flooding is acceptable. Subsequent securing of fallen trees using a combination of stakes and wiring will ensure its long term stability.

LWD could also be obtained by the selective coppicing of individual multi-stemmed alders at the site. Whatever the source of the LWD, it is important that the Environment Agency are made fully aware of the intention to retain it within the river to avoid its removal by the Agency during routine maintenance operations, and to ensure that its retention does not prejudice flood defence interests locally.

- Additional cover could be provided by the planting of goat willow *Salix caprea* whips alongside the channel, a practice regularly adopted by John Aplin on the Dorchester AA fishery. These whips not only provide cover as they grow, but also act as a nursery of woody material for future years. Other species that could usefully be planted along the banks include ash *Fraxinus excelsior* and hawthorn *Crateagus monogyna*. Planting of additional alders is not recommended due to the prevalence of *Phytophthora* infection in the reach.
- The quality of the sections of suitable spawning gravel could be improved by establishing a regime of cleaning spawning gravels each September. This can be achieved by either manual or mechanical (tractor mounted cultivator) raking, or by the use of high-pressure water jets. Care must be taken to clean riffles rotationally, with only short sections being treated annually. The EA may be able to undertake this work on behalf of the fishery, or to lend the appropriate equipment. It is imported that the EA are contacted prior to any cleaning of gravel, due to the possible discoloration of water in the river resulting from the operation. The same concerns dictate that downstream neighbours should also be forewarned of the operation. In order to monitor the success of any gravel washing, it is further recommended that an annual count of spawning redds is undertaken. Key spawning areas should be walked during November- January and observed redds logged and counted.
- The broad gravel shallows could usefully be narrowed by the construction of small mid-channel islands. These would increase visual isolation between pockets of juvenile habitat, effectively raising the carrying capacity of the enhanced river lengths for parr. It would also increase flow velocity locally, thus improving conditions for

the establishment of water crowfoot and encouraging scouring of gravel to the benefit of spawning salmonids. Remote from human disturbance and grazing, they may support different plant communities compared to more accessible banks. Some criticism of the application of this approach to chalkstreams has been received from geomorphologists, who note that the occurrence of such features naturally is unusual in the low energy, chalk stream environment.

Islands can be created from a range of materials, including faggot bundles or coir fibre rolls, retained behind wooden stakes. The outline of the island created by this technique can then be infilled with woody brush, tied/wired in place to prevent wash out during high flows.

- The relic channel narrowing below the roadbridge should be repaired. The narrowing was judiciously located and could be relatively easily renovated. Live willow spiling should be interweaved with dead faggot wood in order to reinforce the structure, increasing its longevity and value as overhanging cover. Successful establishment of the channel narrowing will have a significantly beneficial impact on the presently uniform length of gravel-dominated shallows.
- Where the bank profile was artificially steep, particularly upstream of the roadbridge, opportunities exist to create wide, shallow, marginal berms. These would be created by the excavation of the existing banks with excess spoil being incorporated into adjacent arable fields. An EA land drainage consent and an exemption under the Waste Disposal Regulations would be required for this operation.
- There is an opportunity to redistribute flows between the RB carrier and LB carriers at the upper end of the fishery. It appeared that the status quo prioritised the majority of the flow to the LB carrier. Whilst this channel clearly had excellent potential for spawning trout and subsequent juvenile recruitment, it was very artificial, relatively short and very open to public disturbance. The RB channel was far more natural, with a longer course and significant opportunity to develop a nursery area away from public disturbance. It is very difficult to offer categorical advice regarding the desirability of the re-distribution of flows between these channels on the basis of a single short visit. However, it is felt worthwhile to at least pursue consideration of the potential benefits of such a change with the Environment Agency fishery staff. It is recommended that contact should initially be made with Dr Allan Frake at the Agency's Blandford office.

If any changes to flow apportionment are proposed, it is likely that an abstraction licence and Land Drainage consent will be required from the Agency.

- In order to further assist in the build up of brown trout stocks, use could be made of deep substrate incubation boxes. These are gravel filled boxes, approximately 0.6m in each dimension that are filled with suitably sized gravel and seeded with 10,000 - 20,000 trout eggs. A water feed at the bottom of the box (using a head difference created by a sluice or riffle) allows the eggs to incubate and hatch. A box could be located adjacent to sluices present along both the RB or LB carriers at the western end of the fishery.

Once they reach the swim-up fry stage, fish leave the box via the overspill pipes, where they could be collected in a small trap box and transferred into the river or allowed to enter the river unaided and disperse. In effect, these are naturally reared fish without the unhelpful behavioural modifications associated with hatcheries. More details on incubation boxes can be found on the Wild Trout Trust web site www.wildtrout.org or in Volume 2 of the Trust's magazine, *Salmo trutta*. It should be realised that, despite their benefits, these boxes only represent a temporary palliative to enhancement of brown trout stocks in the fishery. They are able to bypass the 'bottleneck' caused by poor recruitment of swim-up fry. However, the long term solution to poor recruitment remains extensive work to improve spawning and juvenile habitat.

- Water voles are one of Britain's most endangered mammals. Recent research has shown that predation and disturbance by mink *Mustela vison* has the potential to adversely impact on their survival. As a consequence, it is recommended that a programme of mink tracking and trapping should be instigated. Use should be made of the recently designed mink rafts, that allow simple tracking of mink movements along the river, and their subsequent trapping and humane destruction. Details can be obtained from the Game Conservancy Trust's website www.gct.org.uk
- Grants for enhancement work, including habitat improvement for water voles, may be available from English Nature as the Frome is designated SSSI.
- Note that the installation of faggots, any other work to the bed or banks of the river or within 8m of it, and the introduction of fish or their eggs all require the written consent of the EA.