



## River Avon – Services Fly Fishing Club



An advisory visit carried out by the Wild Trout Trust – April 2009

## **1. Introduction**

This report is the output of a Wild Trout Trust advisory visit undertaken on the River Avon on the Services Fly Fishing Club waters. The report covers various main river and carrier locations from Fifield down to Bulford. The advisory visit was carried out at the request of Mr Steven Strawbridge who serves on the fishing club committee. Comments in this report are based on observations on the day of the site visit and discussions with Mr Strawbridge and Mr Martin Browne, who keeps the river on behalf of the fishing club.

A key element of the advisory visit was to look at the various nursery streams and carriers and to provide the fishing club with advice on how best to manage these streams with a view to enhancing nursery habitats. The fishery has a long history of trout stocking, with both adult diploid stock and fry. Most of the main river beats are heavily reliant on stocked fish to provide sufficient sport for the current membership.

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 Avon rises in Wiltshire east of Devizes draining the Vale of Pewsey. From here it cuts through the chalk scarp at Upavon, flowing southwards across Salisbury Plain through Durrington, Amesbury and Salisbury. To the south of Salisbury it enters the Hampshire Basin, flowing along the western edge of the New Forest through Fordingbridge and Ringwood, meeting up with the river Stour at Christchurch, to flow into Christchurch Harbour at Mudeford. All the significant tributaries of the Avon including the Nadder, Wylye, Bourne and Ebble converge within a short distance around Salisbury.

The Avon enjoys the highest level of nature conservation protection being designated as a Special Area of Conservation (SAC) under the European Habitats Directive. A number of habitats and key species, including Atlantic salmon (*Salmo salar*) are cited as being key features of interest of the SAC.

## **3. Fishery overview**

The Hampshire Avon, is considered to be one of the finest chalk stream trout (*Salmo trutta*) fisheries in the country. The river also has the reputation of being the country's premier chalk stream salmon fishery and, although not producing the numbers of salmon it once did, is still an extremely important fishery. The Services FFC waters are probably at the very upstream limit of normal salmon migration. From Salisbury downstream, the river is also nationally renowned for the quality of its coarse fishing; making the river the most famous all round mixed fishery in the country.

The Services waters extend for approximately 11 miles from Fifield, near Netheravon at the top end of the fishery, down to the village of Bulford. The Services FFC waters are famous for once being managed by Mr Frank Sawyer, who is regarded by many as a pioneer of modern chalkstream fisheries management.

#### **4. Habitat assessment.**

##### **4.1 Carriers**

During the visit, several kilometres of side stream and carrier were inspected, including the newly created channel at Fifield. The Haxton Nursery Streams, the Choulston Stream, Dean's Meadow Carrier, the Nut Bush Stream and the bottom of the Nine Mile river were also inspected. Some of these are loops or carriers and were probably originally constructed to service old water meadow systems, while others, such the Deans Meadow Carrier were dug out to try and create nursery habitat. The Nine Mile River is a true Avon tributary and provides extensive high quality habitat for wild trout. Although a fantastic resource for the River Avon, most of the production from this stream will benefit fishing clubs lying below Bulford.

##### **4.1.1 Fifield loop**

This is a newly created wetland habitat that was funded by the Environment Agency and Natural England. The scheme appears to be targeted for the protection and improvement of Desmoulin's whorl snail. The flat gradient and fine bed sediments are not conducive to good quality salmonid spawning and nursery habitat. Stocking with high densities of hatchery derived juveniles may not produce any significant output and may well be undesirable to the overall objectives of the enhancement scheme.



Modest flows and a flat gradient. Marginal habitat for juvenile trout

#### 4.1.2 Haxton Nursery Streams

The Haxton nursery streams do provide some scope for juvenile trout. The upstream carrier on inspection appeared to support a decent number of juvenile trout. Again the gradients were modest and there were very few ideal spawning locations, however, there were some locations where there was sufficient flow and marginal cover to provide some good juvenile habitat.

A serious concern on this channel is the fact that it is the major feed to the Services fish farm facility. It is possible that significant numbers of juveniles may well get entrained into the fish farm and never find their way down to main river locations.

Approximately halfway along the top carrier there is a minor bank breach which has resulted in a small stream flowing across the meadow to connect with the bottom carrier. This small stream makes good use of the height differential between the two carriers and some decent juvenile habitat has formed as a result. Consideration should be given to formalizing the amount of water flowing into the bottom carrier via this route and works to provide some low scrubby cover to deter avian predators will ensure that the production from the channel is not lost.

The lower of the two Haxton streams does provide some decent holding water for juvenile trout. Good quality spawning sites were again at a premium but this could be resolved with the importation of some new bed material at one or two locations. The fact that this carrier rejoins the upper carrier below the fish farm abstraction point is a major advantage.



Haxton top carrier. Flat with a silt bed and feeding into the fish farm



Haxton top carrier. More potential for juvenile trout but in need of better quality gravels



Breach from the top carrier. Very shallow water makes good trout fry habitat

#### 4.1.3 Choulston Stream

The Choulston stream is generally not regarded by the Services FFC as one of the primary nursery streams. This stream rises from springs and runs parallel to the main river and is harnessed to supply water the Services FFC hatchery. Water quality appeared to be excellent but some doubt was expressed as to whether the stream maintains continual flow during a dry year (particularly on the section below the hatchery). The sections inspected below the hatchery appeared to provide some excellent spawning and nursery habitats. It was not clear, however, if there is good access for broodstock wishing to migrate up from the main channel to spawn.



The Choulston Stream. Great spawning and nursery habitat for trout but is there access for migrating broodstock?

#### 4.1.4 Dean's Meadow Carrier

The Dean's meadow carrier was a purpose built spawning stream that was constructed under the supervision of Frank Sawyer. The channel could potentially provide a long reach of juvenile trout habitat although it is currently semi derelict due to the silting up of the inlet. The carrier was created by tapping into the main channel, taking water via an old concrete culvert. Although the length of channel is even longer (in excess of 1 km) than the parallel main channel, the carrier could provide some good habitat by utilizing the head of water created by the Figheldean Milling impoundment.



Old inlet channel to the Dean's Meadow Carrier



A long section of habitat could be created by re-instating the off take



The Dean's meadow carrier picks up some groundwater on the lower section and with more flow could expose some decent spawning substrate

#### **4.1.4 Nut Bush Stream**

The Nut Bush Stream is another carrier loop, taking water from a section of main river above Gunville hatches and supplying water via a kilometer of good quality spawning and nursery habitat. Looking at some of the old structures dotted around the meadow it seems likely that this carrier was originally constructed for early meadow irrigation.

At the inlet to the stream a line of stones currently restrict flows into the channel. It is not clear why this has been done, particularly as the section of main channel is heavily impounded by the Gunville hatches and offers no spawning or nursery habitat for trout habitat for trout.

The carrier appeared to have two distinct habitat types, with the top half running through comparatively open meadow of a mainly flat gradient. The low half skirted the meadow and was characterized by a tree lined margin which shaded the channel, restricting both light penetration and subsequent weed growth. This section did, however, provide some excellent trout habitat through the provision of large woody debris, which in places promoted good quality spawning and nursery habitats. There is often a presumption against heavily shaded channels on chalkstreams however, where there is sufficient inchannel debris and associated cover they can provide some superb habitats for juvenile trout.



It is highly likely that the lower section of the Nut Bush channel is already fully populated with wild fish.



A line of stones restrict flow into the Nut Bush Stream. Why?



More flow through the upper reaches of the Nut Bush Stream would improve juvenile trout habitat



Superb trout spawning habitat on the lower section of the Nut Bush Stream created by the LWD

#### **4.1.5 Nine Mile River**

A brief inspection of the Nine Mile River confirmed the fact that this has the potential to be a superb little wild trout fishery in its own right. It discharges right near the bottom boundary of the main fishery and as a result will not provide large numbers of juveniles for the main Services FFC waters. It should, however, be sustainably managed and could provide a wonderful alternative for rods seeking a true wild trout experience.

A further inspection of this stream is recommended to fully evaluate its potential as a wild trout fishery.

#### **4.2 Main River Beats**

The majority of inspection time was allocated to the side streams and carriers with a view to improving juvenile trout production. Main river beats were inspected at Fifield, adjacent to the still water fishery at Fitleton, Choulston, the section below Figheledean Mill and Gunville. My overriding impression of the waters was that so much of it is under the influence of impoundments. Many of these mills, hatches and weirs may well play a vital role in pushing water into parallel channels, for old water meadow systems, the fish farm and perhaps even some working mills or turbines. The net result however is that the majority of the river is comparatively deep, slow flowing and not conducive to salmonid production. The river sections immediately above Netheravon and Gunville hatches were particularly uninspiring. It may not be possible, or even desirable, to remove or lower the impoundments at many of these sites but work should be undertaken to explore possible options. A good place to start could be the

hatches at Gunville which can be easily controlled. It is unlikely that even with all the gates fully drawn that there would be any reduction of flow via the Nut bush stream. Even if there were, this could be compensated for by either lowering the bed at the inlet of the stream or importing some gravel into the main channel just downstream of the confluence.



Downstream of Gunville hatches – good in-channel habitat



Upstream of Gunville hatches – more like a canal than a trout stream!



Two Hatches at Gunville closed presumably to maintain upstream water levels

Opportunities for main stem spawning appeared to be restricted to a few very short locations downstream of existing structures. One such location was at Fighelden mill where the extensive shallows below the hatches providing some good quality habitat. It is likely that some of these sections would benefit from some early autumn gravel cleaning to loosen gravels and remove sediments thus improving egg to fry survival rates (see recommendations).

Treatment of margins throughout the fishery was on the whole sympathetic. It did appear that on some locations there was considerable effort being put into maintaining double bank fishing, presumably for left-handed anglers? This effort is at best misplaced and at worst damaging for marginal habitats. This river is too narrow to warrant double bank management and if beats are required for left-handed anglers then the true RB should be left unmanaged. This will then enable better quality marginal lies for adult trout to be developed by allowing a scruffier marginal regime to develop which, in turn, will help to combat any bank erosion pressures on perched channels in particular.

Thick marginal fringes of emergent vegetation are crucial for certain adult life stages of invertebrates, many of which are crucial to maintaining high quality dry fly fishing opportunities. The occasional encroachment of low scrubby trees and shrubs such as goat willow or sallow (*Salix caprea*) should also be encouraged. This often renders some areas unfishable which is essential in maintaining good numbers of wild broodstock.



Some marginal debris such as this example below Figcheldean should be retained if possible

## 5. Trout Stocking

During the visit there was some discussion about the use of the nursery streams for stocking juvenile trout. The Services FFC club has a desire to stock the best quality trout possible to provide sport for the members and to provide a stock of fish that can replicate themselves through natural spawning.

There is mounting evidence that interbreeding between domesticated farmed trout and wild fish can lead to lower fitness and survival amongst the offspring, reducing the numbers of river-bred fish in the population. Recent changes to the Environment Agency's National Trout & Grayling Strategy reflect this concern, and by 2015 all farmed trout stocked to rivers will be required to be sterile all-female triploids, or derived from local broodstock. It is understood that the club have already embarked on a scheme in partnership with the Wilton FFC to use wild broodstock to produce numbers of trout for restocking.

The WTT is broadly supportive of the EA policy and believes that wild stocks can only flourish if the central planks of water quality, water quantity, habitat quality and habitat quantity are fully addressed. Increased competition for space and food from hatchery derived stocks will not lead to a stronger and larger wild component of the stock if bottlenecks are not addressed. The WTT therefore recommends that all the habitat problems should be identified and tackled before considering any kick-start stocking with wild-derived fertile stocks. Additionally, the continued supplementation of trout stocks just to augment anglers' catches is best carried out using adult sterile stocks.

Wild trout are notoriously difficult to keep in culture and often perform very poorly in a fish farm environment. Wild stocks are true natal spawners and, once a good quality environment has been provided, local wild fish will often return to the very same spot of their birth to spawn themselves. Trying to emulate the process of natural selection in a wild environment is fraught with difficulty. If some successful production is already occurring, albeit at a low level, then it makes sense to work towards improving the fit and successful stock that you already have. There are many risks of diluting the naturally selected gene pool via the introduction of fish from another system.

There is still so much that we simply do not understand about the importance of genetic variation. Despite a hundred plus years of stocking it is obviously not too late because some stocks continue to successfully replicate themselves. However, it is known that genetic variation is reducing due to hatchery strain fish introductions. The rate of this reduction is regionally very variable but, as reported by Prof. Andrew Ferguson at the 2009 WTT annual conference, an overall average loss of 25% of genetic diversity has already occurred. These are special fish and deserve to be given the best possible chance of expanding their range and population size. Providing opportunities and space for development will bring rewards in terms of the contribution wild fish will make to anglers catches but this will require sympathetic treatment of nursery streams and careful consideration of what fish to stock and where to place them. Following my inspection I am convinced that there is precious little space available for fry stocking on the Services waters and that continued fry stocking will only put more pressure on fit Avon fish that are still recruiting despite the odds.

## **6. Conclusions**

The main river beats in general are managed sympathetically although trout and ultimately anglers would benefit from a more relaxed approach to marginal maintenance. There would seem to be no justification in managing access for double bank fishing on some of the beats and some significant habitat benefits and cost savings could be had from having a one bank access policy.

Without doubt, the single biggest benefits to trout habitat could be derived from looking at the numerous structures which impound the river throughout its length. This issue has been identified in many of the River Basin District Plans under the Water framework Directive and is a huge issue which restricts many rivers from meeting good ecological status. Now is the time to look again at the function of some of these structures and try and tap into the political will (and resources) needed to resolve problems. The Gunville sluices in particular look to be ripe for a change in regime.

A recent study undertaken on some similar hatches on the River Nadder, as part of the Avon STREAM project, provided a real insight into the impacts structures have on habitat development. On the Nadder at Fovant some old undershot hatches that had been in place for many years were lifted and the upstream water levels dropped. Initially the channel looked awful with exposed mud margins and shallow silty glides. The elevated water velocities soon got to work in carving out underlying soft sediment to expose new shallow gravel glides that were rapidly populated with new beds of water crowfoot (*Ranunculus spp*). A

similar result could be expected above the Gunville Hatches if they were to be fully drawn for long enough. A copy of the research output is attached to this report.

**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 Development Control Officer.**

The range of nursery streams and carriers currently only offer limited opportunities for wild trout production. The bottom sections of the Nut Bush Stream and possibly the Choulston Stream offer the most promising potential without modification although there may be some access issues into the latter.

The Fifield Carrier and the Haxton Streams are comparatively flat and a little limited in scope. Having a nursery stream that discharges into the head of a fish farm is considered problematic. Both the Deans' Meadow Carrier and the Nut bush Stream however offer real scope for development. Securing more vigorous flow and enhancing inchannel habitats will improve and develop these streams and this should be a priority action.

The juvenile habitats that currently exist only have very limited capacity. Using these streams to saturate stock with hatchery-produced fry will result in increased competition for space and food amongst local wild stocks. Newly-developed nursery streams will often naturally populate with local wild stocks very quickly. There is an argument for using local wild broodstock to provide fry to kick start a population if natural decolonisation is slow. This should, however, only require a one-off introduction. If the population does not develop; then there are still bottlenecks that need to be removed and no amount of annual stocking will build the wild component of the stock.

The Services FFC has lots of main river water that is not conducive for wild trout production and for which there is a real need to stock to provide sport for the membership. From discussions with Mr Strawbridge and Mr Browne it would appear that there is still a reasonable demand for stock fish to be supplied for anglers to catch and kill. On such a fishery it makes sense to provide adult stock fish that will not impact the breeding of wild stocks or disappear on spawning migrations. If aesthetics and fin quality are an imperative requirement, then perhaps fingerling sterile stocks could be brought in and grown on in low densities on the Services FFC farm. If vaccinated against furunculosis it is likely that hatchery derived triploids will over winter better than conventional diploids and cope better in a fish farm environment than any wild-derived stocks.

There is enormous potential for delivering better quality wild stocks on the Services FFC stretch of the Avon without the risk and expense associated with running a wild hatchery programme. By stocking with adult sterile fish and working at improving wild stocks it will be easy to measure and monitor success. By contrast, with a programme of fry stocking you will never know if you are building the truly wild stock or just suppressing it.

## 6. Recommendations

- Explore the opportunities for lowering or removing existing impoundments which currently restrict habitat development and fragment populations of fish.
- Investigate the options for securing more flow into both the Dean's Meadow Carrier and the Nut Bush Stream. A consultation with the Environment Agency and perhaps an abstraction licence may be required in the case of the Dean's Meadow Carrier. Once more flow is secured further works to improve access for migrating adults and the provision of good quality spawning habitats should also be addressed.
- Undertake a winter survey of current spawning locations and target them the following year with a programme of gravel cleaning using high pressure pumps or back pack leaf blowers. Further information on these and other techniques can be found in the WTT Chalkstream Habitat Manual
- Use pieces of secured large woody debris on shallow riffles in the carriers to help clean and sort spawning gravels
- Undertake a programme of tree planting with the odd willow or goat willow (*Salix caprea*) on long open sections of main river, carrier and mill stream to provide improved holding habitat.
- Review the bank maintenance regime and refrain from managing access on opposing banks.
- Review your current stocking programme. A combination of stocking with adult sterile fish into main river beats and leaving the carriers for purely wild production will help to build the wild component of the stock without compromising catch rates.

## 6. 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 an approved WTT 'Wet-Work' experts will complete a demonstration plot on the site to be restored. This will enable project leaders and teams 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.

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