River Tarrant in Dorset

An advisory visit carried out by the Wild Trout Trust – July 2010

1. Introduction

This report is the output of a Wild Trout Trust advisory visit undertaken on the River Tarrant, a Dorset Stour tributary. The advisory visit was carried out at the request of Sarah Worral, representing the River Tarrant Preservation Society (RTPS), which has an active interest in protecting and improving this small Dorset chalkstream.

The RTPS are looking for advice on management and maintenance of the stream and are particularly interested in exploring any ideas that might assist fish populations during periods of little, or no flow. This issue is discussed further in section 2, 3 and 4 of this report.

Comments in this report are based on observations on the day of the site visit and discussions with Sarah Worral, Rose Mannering Burton, James Mallet and David Porter from the RTPS. Further information has subsequently been obtained from Nicole Caetano from the Environment Agency.

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 winterbourne section of the Tarrant generally rises north of Tarrant Gunville and flows about 13 km south to join the River Stour downstream of Blandford. The source of any winterbourne and indeed most chalkstreams, will vary according to winter rainfall levels and will migrate down the hydraulic gradient in response to prolonged periods of below average rainfall.

The Tarrant upstream of Tarrant Monkton is regarded by the Environment Agency as a true winterbourne. The perennial source of the Tarrant usually manifests itself somewhere on the reach between Tarrant Monkton and Tarrant Rawston, below which the stream consistently flows. Further downstream, below the village of Tarrant Keyneston the channel is believed to be perched above the ground water zone. This section, as far downstream as Tarrant Crawford, also dries up following a long period of below average rainfall.

Anecdotal information suggests that the perennial head of the stream has dropped further down the valley in recent years. The stream now regularly suffers from the adverse effects of low flow, even on sections that used to enjoy relatively reliable flows throughout the year. The RTPS is concerned that low flows are potentially exacerbated by abstraction pressures from local licensed bore holes. A hydrological survey has suggested however, that abstraction pressures may not be responsible for the excessively low flows now regularly experienced in the valley.

A particularly distressing aspect of the regular drying up events is the loss of significant numbers of wild brown trout (*Salmo trutta*). These fish run up the stream to spawn and are vulnerable to excessive bird predation when they become pooled up in short sections of stream. The Environment Agency

monitors the condition of the stream and they have regularly carried out fish rescues to relocate stranded fish back into the Stour system where flows are reliable and constant.

The Tarrant at Tarrant Launceston, just above an old water meadow sluice. Structures like this can act as a trap for fish wishing to migrate downstream as flows drop off

3. Habitat assessment.

At the time of the inspection the Tarrant was largely dry upstream of Tarrant Launceston. An inspection of the reach further up the valley at Tarrant Hinton revealed a marked difference in the characteristics of the channel. A long section that lies parallel with the road has been subjected to what appears to be a flood alleviation scheme, possibly following the groundwater flooding events in 2000/2001. The section throughout this reach appears to be quite wide, with a stream bed predominantly consisting of some gravels and deposited soft sediments. Weed growth in this section was prolific and was dominated by aquatic emergent plants, many that are usually associated with river margins such as hemlock water dropwort (*Oenanthe crocata*), rather than central channel locations.

Hemlock water dropwort is a native plant but one which can be very invasive when conditions suit it. Some selective thinning of the plant may well help to promote a more diverse plant community and improve biodiversity within the channel. This plant is known to have toxic properties and plants should not be pulled up and left on the bank-side as they can be lethal if consumed by livestock. It is recommended that if the plants are being hand pulled by

volunteers then gloves should worn and hands thoroughly washed following any contact with the plant.

Hemlock Water Dropwort. A native plant that can dominate the channel flora.

Further upstream the channel diverted away from the road through a meadow, where the channel was unfenced and presumably grazed by livestock. Here the channel was much narrower, with the bed mainly consisting of gravels and very few emergent plants. Presumably during periods in the spring and early summer, when the stream is still flowing, it will support communities of flow loving aquatic plants such as water crowfoot (*Ranunculus spp*). Some species of crowfoot are extremely well adapted to winterbourne environments, as are several other species of plant and invertebrates. One species of mayfly (*Paraleptophlebia werenii*) is exclusively found in winterbourne environments. The Dorset Wildlife Trust should be able to confirm if this insect has been recorded on the Tarrant system.

The interesting comparison with the two sections is that the road-side section, which is presumably “managed”, will probably require significantly more work to sustain an unblocked and free flowing channel Than the un-managed section upstream, which appears to function without the need for intensive maintenance. Obviously grazing pressure helps to control blockages from plants but it is probably the smaller channel dimensions that maintain increased water velocities and less opportunity for soft sediment to deposit.

A similar contrast in habitats was observed on the next section inspected just above Launceston Farm. Above the access bridge the stream had been fenced some time ago to exclude all grazing livestock. Here the channel was completely

shaded by a range of trees, shrubs and marginal emergent plants, so much so that it was virtually impossible to view the channel. The only exception was where one or two mature ash trees had grown out over the channel, promoting pool habitat below the trunk and providing sufficient low shading to the channel to restrict heavy marginal plant growth. Shaded pool habitats such as these can provide a refuge for fish when the stream shrinks and flows drop off.

The channel looking upstream of the access bridge near Launceston Farm. The lack of any maintenance or grazing pressures has resulted in the channel being completely shaded and hidden from view by a range of trees, shrubs and marginal scrub.

In looking downstream from this vantage point a stark contrast could be seen, where the channel was virtually devoid of any plant cover due to unfettered access by grazing cattle. The stream was carrying a small trickle of water, but it is highly unlikely that this section could sustain a viable trout population. Any fish wishing to reside in this section would be extremely vulnerable to bird predation and would possibly also suffer from unacceptably high water temperatures due to the lack of any significant shade, exacerbated by little or no flow.

Currently several groups with an interest in chalkstream management are having a debate about the pros and cons of stream and river bank fencing. When looking at these two sections lying adjacent to each other the long term consequences of both heavy grazing and no grazing at all are obvious. There will certainly be species of plants, insects and invertebrates that might benefit on one of the two extreme types of habitat. Most research carried out on wild trout populations indicates that they thrive in a varied habitat of dappled light and

shade. There is a strong argument to suggest that the best scenario for a chalkstream is to have some low density marginal grazing. This is often easier said than achieved. In lieu of any grazing pressures there is a requirement to maintain the stream margins to restrict the growth of too much scrub and dominance by successful emergent plants. Trout thrive in a diverse habitat of shaded pool and open riffle habitat; therefore, when the riparian zone is managed to create a diverse range of habitats it is usual for a wider range of plants, animals and invertebrates to benefit.

It should be remembered that the channels here form a network of old water meadow systems and as well as the biodiversity elements to consider there are landscape and heritage issues that need to be included in any management plan.

Not a great photo but this is the section of channel running downstream from the bridge. Apart for the tree in foreground the channel here enjoys no shading at all.

The next section of channel to be inspected was just downstream of Tarrant Monkton. Here the stream was flowing but it still lies within an area prone to regular drying out events.

The legacy of an old agricultural irrigation system was evident, with a straightened, perched channel for “drowning” the adjacent meadows and a corresponding low level channel running parallel on the “down slope” side of the meadows. The majority of the flow was carried in the high level channel, which was impounded by a typical sluice type structure .

The perched channel was typically over wide and uniform in nature and dominated by a thick growth of mainly cress (*Rorippa sp*) and fools cress (*Apium*

nodiflorum). The land owner, Mr James Mallet, stated that the channel here often looks superb in the early spring, with the stream flowing strongly with large beds of flowering water crowfoot. Trout are also observed utilising this reach from time to time but it is thought that full migration up and down the system is hampered by an on-line pond lying further upstream.

Wide flat channel choked with cress below Tarrant Monkton.

Open channel habitat can be seen running under the shaded RB margin

Downstream of this point the two channels met to form a more natural meandering channel flowing through a largely wooded valley. Again the channel appeared to be very wide for the given flow, with the result that even where open water habitat could be seen, a detectable flow was barely discernable. It is thought that a range of measures could improve in-channel habitats on this section and they are discussed in more detail in sections 4 and 5 of this report.

The next section of river inspected was at Tarrant Rawston. This section would appear to be the upstream limit of the permanently flowing section of stream. This was also evident by the large numbers of trout that were observed holding up in shaded pools at various locations in this area. The high densities of fish present are almost certainly artificially concentrated due to the shrinkage of upstream sections, resulting in a downstream displacement of fish looking for a suitable territory. Trout are not by nature a shoaling fish and even in an environment where there is sufficient water for them they will still experience stress related problems if they are concentrated together in short sections for long periods of time.

This pool in Tarrant Rawston was home to approximately a dozen trout before fleeing for cover. A pool like this would normally only support one or two fish.

Below the mill at Rawston the stream flows through the gardens of Mr David Porter. The stream here supported some good quality spawning habitat with a clean gravel bed that appeared to be comparatively loose and silt free. The channel was artificially straight in places and afforded very little in the way of overhead cover but despite this Mr Porter reported that sea trout frequently spawn on this section in the winter. The provision of some improved holding lies

and additional over hanging cover would further improve the spawning potential of this reach. This is explored further in section 5 of this report.

Many marginal sections of bank on the Tarrant were revetted with a variety of materials such as wooden poles or stone.

Many sections of bank along the whole length of the Tarrant are revetted with hard materials. Hard revetment is a hostile environment for native plants, invertebrates and mammals such as water vole. Where possible, low soft banks should be retained and protected with a fringe of native plants that absorb the energy of the stream during high flow conditions and provide critically important habitats for a range of species throughout the year.

Several short sections were inspected in and around the village of Tarrant Keyneston. This reach is only a few kilometres from the confluence with the Stour but never the less the stream here also suffers from very low flows, with regular drying out episodes.

An additional problem for the stream and resident fish communities are the number of in-channel structures (e.g. weirs) that fragment populations and damage in-channel habitats.

A large impoundment presumably installed to facilitate an old abstraction. Structures like this fragment fish populations and damage in-channel habitat by promoting siltation upstream

4. Conclusions

The River Tarrant is a very unusual chalkstream in that the winterbourne sections are not restricted to the very upper most reaches. This will inevitably always be problematic for fish species that run up the river during times of high flow and subsequently become stranded when the flows drop off.

The cycle of upstream migration by adult trout and a downstream displacement of adults and juveniles is one that is perfectly natural. The loss of large numbers of trout through bird predation when the stream shrinks, or worse still when fish are left gasping in isolated sections is very distressing but is a scenario that often occurs even on un-impacted rivers and streams. The trick is to ensure that the stream behaves in a natural way that enables fish of all life stages to migrate up and down the system as freely as possible. Some will inevitably get isolated and perish but unfortunately the many man-made structures that have been constructed on this stream are exacerbating the problems of fragmenting fish populations and habitat.

True winterbournes provide a very important habitat for a range of species, some of which are uniquely adapted for this environment. Whilst a permanently babbling stream is what we would all like to see, the reality is that this stream is a critically important habitat in its current form, even during those periods when the flow is subterranean. An appreciation of its true value as a winterbourne will help to offset any feelings of anxiety during those periods when the stream completely dries out.

Following the site visit, an approach was made to Wessex Water to explore possible options for augmenting the flow from bore holes located at the head of the Valley. Information from the Water Company suggests that the feasibility of augmenting flows has been discussed with the Environment Agency and that a number of issues were highlighted that would make such a proposal very difficult to justify. As a true winterbourne, augmenting flows all year round may well have a detrimental effect on key species present within the system. Also when flows drop away there is the distinct possibility that any flow pumped into the system will only augment a very short section of channel before the water percolates through the porous bed. Lining the channel over long distances would be astronomically expensive and drastically change the hydraulic and ecological characteristics of the stream. It would appear that augmenting flows is not an option that would gain wide support from the Environment Agency, Natural England or the Water Company.

While walking the Tarrant, it was very apparent that management and maintenance regimes were very different leading to extremes in habitat quality and availability. We in the WTT often quote the fact that trout populations sometimes thrive from “benign neglect” however, in a small stream such as the Tarrant, the stream does not have the power to form and maintain high quality in-channel habitat. Many sections of the stream have been diverted into either straight irrigation channels, field drains, garden features or just left to become an over grown wilderness. In order to maximise in-channel habitats for trout, a few guiding principles need to be adopted. These will include prioritising flows into low level channels, rather than diluting flows through parallel perched or high level channels, which are prone to siltation.

On sections where there is no access for grazing animals, a light maintenance regime is required to punch some holes in the canopy to promote a dappled light and shade 60% shading overall is a good ratio to aim for. Conversely on the reaches where there is currently full unfettered access to livestock then some tree planting and either temporary, or permanent fencing to enable some small blocks of cover to become established is recommended. The ideal scenario is access for low density grazing. Achieving an ideal grazing regime is extremely difficult unless the riparian landowners are fully committed to the aims and objectives of improving the stream habitat and adjusting stock densities accordingly.

Many sections of the channel are comparatively wide. During short periods of high flow these sections may perform well but as the flows shrink away, the wetted channel losses its definition and the whole channel width tends to get choked with emergent aquatic plants. Improvements to in-channel habitat can be effected by encouraging a much narrower wetted channel to develop so that under high flows the bed is scoured slightly and maintains sections of clean, silt-free gravel. Rather than any expensive landscaping or modifications to existing channels, improvements could be achieved through the imaginative use of pegged down tree trunks and branches to create flow deflectors. These should be located to concentrate available flows into narrow flumes. Further advice on how this might be achieved can be obtained from the EA or the WTT. Alternatively there is useful information on using these techniques in the WTT Chalkstream Habitat Manual.

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 EA's Development Control Officer.

6. Recommendations

- Work with local landowners and the EA to identify weirs and structures that currently fragment habitat and fish populations.

- Prioritise a list of actions aimed at modifying or removing structures that restrict upstream fish migration and act as a trap for fish wishing to migrate back downstream.

- The Tarrant is a true winterbourne and potential schemes designed to augment surface flow are probably not appropriate or sustainable. That said, assurances should be sought from the water companies and regulator that abstraction pressures will not be allowed to adversely impact on surface water flows.

- On sections of stream that are extensively over grown consider the option of allowing some livestock access for light grazing.

- On sections of commercial farmland, where the stream is unfenced and the stream margins excessively grazed and trampled, create some occasional refuge areas by planting small blocks of marginal native trees such as willow, alder or thorns and protect the area with fencing.

- Where the channel runs in parallel channel consider prioritising the flow in favour of one single, low level channel.

- Where the channel is wide, flat and choked with emergent plants, secure large woody debris flow deflectors made from tree trunks or branches to concentrate flows into a pinched channel.

- Discourage clumps of marginal emergent plants from growing in central channel locations.

- Remove clumps of non native plants, such as Himalayan balsam and reduce the density of Water dropwort hemlock where it forms monocultures.

- On flowing perennial sections, where large numbers of trout can at times be concentrated together, retain as much brash or coarse woody debris within the channel as possible to reduce predation pressures.

- Some occasional thinning of the tree canopy in sections of heavy tunnel shading is recommended.

7. 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 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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