



Box Brook – Bathampton AA



An advisory visit carried out by the Wild Trout Trust – June 2008

1. Introduction

This report is the output of a Wild Trout Trust advisory visit undertaken on the Box Brook on 6th June 2008.

The WTT was approached by Mr Jerry Walsingham, representing the Bathampton Angling Association, to provide some general advice on the current status and management of the trout fishery and in particular on any opportunities for improving habitats for wild trout.

The comments and recommendations made in this report are based on the observations of the Trust's Conservation Officer, Andy Thomas and discussions with club officials, Mr Walsingham and Mr Derek Hull

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.

The Box or By Brook is a tributary of the Bristol Avon. It rises from the limestone west of the village of Burton before flowing south down a gentle gradient before picking up other smaller tributaries north of Slaughterford. From here the river swings south west on its way to join the Avon near Batheaston. The local geology is dominated by clays, oolite limestone and occasional outcrops of bathstone.

The club's trout water on the Box brook starts just over a mile upstream from the Avon confluence and extends for approximately two and half miles upstream to the village of Box. The river in total is approximately 10 miles long.

The Bathampton AA is one of the largest and most progressive angling clubs in the area. The club caters for all types of angler, with the main emphasis being coarse angling on the club's range of river and still water fisheries. Details of the club can be found at www.bathampton.org

The Box Brook fishery is the club's only recognised trout fishery and consists of approximately two and half miles of stream. It is currently managed as an unstocked trout and grayling fishery. The club limit the number of season and day rods and restrict anglers to fly only methods and actively encourage catch and release tactics.

2. Description of the Fishery

The Box brook is a delightful clay/limestone stream which appears to have been subjected to some significant land drainage works in the past. Very little maintenance works appear to have been carried out, other than those undertaken by the fishing club to facilitate some access for angling. Nevertheless, some sections remain extremely overgrown and virtually impossible to fish.



A typical section of the Box brook with good marginal cover and valuable beds of water crowfoot. Note the impenetrable jungle!

The river is characterised by a deeply incised and heavily shaded channel with a relatively diverse morphology made up of pool, glide and riffle. The only exception to this is the section immediately upstream of the weir, which lies approximately 500m above the bottom boundary. Here the river is influenced by the impoundment, being comparatively deep and slow flowing.

The weir itself looks to be an old structure, possibly used long ago to facilitate meadow irrigation. The structure was repaired by the angling club a few years ago and a small control structure adjacent to the RB was refurbished, giving the club some control over upstream water levels and velocities.

Much of the marginal habitat is dominated by mature stands of willow, alder, ash, hawthorn, birch and sycamore. There is some evidence of previous pollard works but generally tall trees dominated both banks.



An old willow pollard in need of further work



Selective thinning of leggy birch and sycamore would promote increased productivity

Although quite shaded, the channel has benefitted from a relaxed approach to maintenance and in particular the retention of large woody debris (LWD). Several examples of where fallen trees have enabled good holding pools to be created were observed. In addition trees that have fallen onto comparatively shallow sections have mobilised aggregates into good quality spawning and nursery habitats.



A naturally “hinged” tree has created a superb lie for trout.

Where fallen trees are creating a major problem for angling access or are not promoting good quality habitat then they can often be moved or winched into a position where they will work to provide a useful current deflector, cover for fish from predators, or simply as a primary source of food for invertebrates.

It is important to ensure that any LWD is stable as it was quite evident that the the stream is comparatively flashy in nature. LWD should be wedged into the bank or wired to live trunks to avoid them becoming a flood risk at vulnerable locations such as culverts or bridges further downstream. Pinning the material to the river bed with either chestnut stakes or steel re-inforcing bar is often an effective method.



The Box brook has the power to mobilise large trees so it is vital to secure LWD when using it to promote trout habitat



A fallen "rooted" tree promoting pool scour and a gravel riffle – good trout habitat

Reasonable beds of water crowfoot *Ranunculus* sp were observed on some sections where sufficient light was reaching the channel. This plant is synonymous with good trout habitat. It traps sediments, provides cover for fish and is also home to key invertebrate species important to dry fly fisherman. Water crowfoot will only flourish in comparatively shallow water where the substrate is firm. A soft silty bed or water deeper than 75 cm is unlikely to support this plant. It is important therefore that when trying to promote the plant through sensitive tree works that suitable sections of channel are selected.



Water crowfoot provides habitat for invertebrates and trout

Riparian tree works should only be undertaken outside the bird nesting season. Mature trees, or those with significant ivy growth, may well support bats which are protected by law. It is recommended that you consult with the local authority before contemplating any significant tree works. Coppicing or pollarding, although often preserving and lengthening the life of trees, can sometimes be controversial in the eyes of the general public.

Low marginal cover in the form of overhanging tree branches and bushes should be retained if possible; this is valuable habitat for adult trout. Tree cover can also provide valuable temperature refuges, something that may become more important as summer temperatures increase due the predicted effects of climate change. Creating a dappled mosaic of light and shade is usually the optimum pattern to aim for.



A thick bed of burr reed *Sparganium* sp pinches the channel



Pipe reed *Schoenoplectus* sp forming a central island

Beds of aquatic emergent vegetation were well established in several areas. On one section near the bottom of the fishery, burr reed had established out from a soft margin, pinching the channel and creating an excellent run which was enhanced by a lovely low scrubby fringe on the opposite bank. Fishing access to the fishery is inevitably via wading so it is recommended that habitats like this are left to find their own equilibrium. Mid channel growth of pipe reed (common club rush) may, however, require some light maintenance. A mid channel island can promote excellent habitats although occasionally the plant will spread right across the channel and rather than promoting lateral scour either side of the bed may clog the channel, raising upstream water levels and potentially slowing velocities.

Pipe reed can be grubbed out but it is extremely hard work. It can also be controlled with a contact herbicide although it is recommended that this work should only be undertaken by a qualified specialist. **Environment Agency consents are required for all applications of herbicide within 8 metres of a water course.**

The one area where the author believes there might be scope for increased production is through the creation of spawning and nursery habitats. The bottom section of river below the weir had precious little spawning habitat apart from one short section just below the weir itself. That said, there was evidence of small trout present and reports from the angling club suggest strong populations of trout and grayling, even in the bottom beat.

Further upstream and out of the influence of the impoundment, better quality spawning and nursery habitats were found. Several small side streams were inspected but the ephemeral nature of flows and poor access into these very small systems severely limit their potential. The apparent strong densities of wild fish may, in part, be due to better quality habitats found further upstream. The Bathampton AA section of the Box brook is a long way down the system and potentially benefits from strong recruitment in the headwaters and a possible downstream displacement of juveniles looking for good quality holding areas.



Excellent spawning habitat on the upper half of the fishery just below the gauging weir

One possible course of action that can potentially boost trout production on rivers with limited spawning habitat is to import new spawning substrate. Care must be taken to identify suitable sites as raising river bed levels can adversely effect upstream habitats by backing up the levels and encouraging deposition.

Downstream of the existing weir and on a straight run of channel would be the best site to choose. The spawning riffle should be at least 20m long and have a depth of gravel of at least 30cm with the aim of ending up with a normal summer water depth of approximately 25cm.

The principle is to line the bed initially with large flint rejects and stone and then top dress with mixed angular river gravels of 15 to 50 mm. Ideally the riffle should have a gentle downstream slope but having a slight ramp up to approximately the front third of the riffle and then a gentle slope down over the remainder also works well. The riffle should be very slightly dished in the centre, however, in reality the gravels are often relocated following the first spate. This should not be a concern on a straight run where generally the material will lock and settle into a natural looking riffle.

Construction of spawning riffles will require the assistance of a specialist contractor and hydraulic excavator. It is highly unlikely that suitable material will be available on site but similar gravels should be available from the network of quarries found in the nearby Cotswolds.

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. Introducing a new spawning riffle will require a land drainage consent on any river designated as "main river". Advice can be obtained from the local Development Control Officer.



A very thin layer of gravel can potentially be augmented with imported material

An area of potential concern relates to the presence of non native plants. Himalayan balsam (*Impatiens glandulifera*) was observed on the RB approximately 200m from the bottom boundary. It is a relative of the busy Lizzie and is known by a wide variety of common names, including Indian balsam, jumping jack and policeman's helmet. It is a tall, robust, annual producing clusters of purplish pink (or rarely white) helmet-shaped flowers. These are followed by seed pods that open explosively when ripe, shooting their seeds up to 7m (22ft) away. Each plant can produce up to 800 seeds. Himalayan balsam tolerates low light levels and, in turn, tends to shade out other vegetation, impoverishing habitats. In the autumn, the plants die back, leaving the banks bare of vegetation and vulnerable to erosion.

Currently only very small patches were observed and it is recommended that efforts are made to eradicate the plant before it spreads too widely.



Highly invasive Himalayan balsam

These plants can be easily pulled up by hand or treated with a contact herbicide (Environment Agency consent required).

Near the top end of the fishery the club only has access to the RB. The LB is in private ownership and forms the curtilage of a large house. Extensive works have been carried out to the banks including soft engineering in the form of willow spiling. Unfortunately other adjacent sections have been utilised as an extension to the formal grounds with extensive ornamental planting right to the top of the bank. Many of these plants and shrubs will not be suitable for a riverbank environment and could leave the bank vulnerable to excessive erosion.

Mobilised sediments, particularly those with a high organic load can adversely affect trout spawning success.



Unidentified shrubs planted on the LB



Newly planted crop very close to the RB

No information is available to the author about the wider catchment land use. Most of the land abutting the Box brook was laid to pasture, however two sloping meadows were under arable cultivation with virtually nonexistent buffer zones. Inappropriate land use in river valley meadows has been identified as a key issue on many rivers. Diffuse pollution caused by nutrient rich sediments running off of cultivated valley slopes can be a huge problem.

Raising awareness with local farmers and land owners can help in planning future crop rotation. Many farmers receive subsidies from DEFRA in the form of Single Farm Payments. To qualify for these payments farmers are expected to prepare soil conservation plans and potentially the introduction of substantial buffer strips can save the farmer money as well as protect the river. Details of agri-environment schemes can be obtained from the DEFRA website at <http://www.defra.gov.uk/farm/singlepay/index.htm>

A short distance below Middlehill bridge is an Environment Agency flow gauging weir. Having the capacity to accurately measure flows is vital for the Agency and is potentially a good source of information for the Angling Association. Unfortunately the method used is via an old fashioned crump weir. These sloping, smooth faced weirs are very effective in doing what they are designed to do, however they are particularly poor at facilitating upstream access for many fish species. It may well be possible for large adult trout to be able to successfully negotiate the weir in spate conditions. The weir will, however, fragment populations during long periods of low flow. Improving fish passage for all fish species is a long term objective for the Environment Agency and perhaps the BAA may wish to raise this issue with the Agency to see if they have any plans for future improvement.



The top boundary. No maintenance work should be carried out on the first 25m

The top boundary of the fishery lies adjacent to a park in the village of Box. This is obviously a very popular site for visitors and locals alike. In order to deter any unwanted guests it may be wise not to open up the first 20 to 30 meters of the RB to act as a screen and a deterrent for would-be poachers. Leaving the short section near the gate for local children to fish and play unchallenged is probably a good idea.

The continued policy of a light touch in terms of channel and bank maintenance coupled with modest numbers of angling visits is the right approach. Access for angling is primarily only possible for the wading angler on long sections of this river. This should not be a problem provided safe access and egress points can be provided. The steep nature of the banks can make this exercise tricky and one solution may be to anchor short sections of thick rope to a buried T bar to aid safe access. Cutting steps into the bank isn't generally recommended as it can lead to a weakening of the bank and possible collapse.

On the day of inspection, a good hatch of mayflies *Ephemera danica* were evident, with a corresponding rise of small trout and grayling. The presence of mayflies in such good numbers is generally indicative of good quality water. It should be noted that this fishery lies downstream of some residential conurbations at Castle Coombe, Slaughterford and Box and it is highly likely that the stream receives treated effluent from a number of sources. The presence of sensitive aquatic invertebrates is encouraging but it is recommended that the angling club carry out some regular assessment of in-channel macroinvertebrates. To this end WTT recommends that fisheries register their interest in taking part in the Riverfly Partnership monitoring and training initiative. The initiative aims to support fishing clubs to monitor and help conserve the environment. More details can be found on www.riverflies.org

3. Conclusions

The Bathampton AA section of the Box Brook appears to be a very healthy wild trout fishery. The river has all the elements required to provide a healthy self sustaining trout population and BAA has a very enlightened approach to its management.

The two weirs located on the fishery are very influential. The gauging weir in the upper reaches of the beat may fragment fish populations and delay or stop important spawning migrations. An approach to the Environment Agency over possible alternative methods of gauging flows should be made.

The old structure towards the bottom of the fishery severely restricts habitat development over a significant length of river upstream of the road bridge. During the visit the hatch was closed in and it is recommended that the gate be fully drawn at all times unless there is an exceptional drought, when maintaining some depth upstream might protect vulnerable fish stocks.

Good quality spawning and nursery habitats were very sparse on the lower section of river. Consideration should be given to the creation of one or two spawning riffles.

There were many examples of good habitat being created by numerous chunks of in-channel LWD. The policy of leaving as much fallen timber as possible should be maintained. If fallen timber is creating unacceptable erosion risks then it should be repositioned and pegged down to prevent any possible flood risk.

Shading on some sections of the Box brook was considered to be excessive. Some simple "sky lighting" to promote a dappled light and shade should be undertaken. In addition some short sections of the Brook were an impenetrable jungle which I suggest are best left alone.

4. Recommendations

- Undertake a programme of sensitive tree management, ensuring that as much LWD is retained within the channel as possible.
- Consider the possibility of creating new spawning and nursery habitats on the lower beat by importing and introducing new spawning substrates.
- Undertake to build up an improved understanding of the needs of wild trout with your neighbours.
- Keep the hatch in the bottom weir fully drawn.
- Promote wild trout conservation with the rest of the trout section. A move towards catch and release may result in bigger trout coming through, as well having local broodstock available to naturally build the population rather than relying on downstream drift.
- Monitor your fly life.

6. Making it happen

There is the possibility that the WTT could help the BAA 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.

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