HABITAT ADVISORY VISIT TO THE EWELME STREAM, EWELME/BENSON OXFORDSHIRE UNDERTAKEN BY VAUGHAN LEWIS, WINDRUSH AEC LTD ON BEHALF OF WILD TROUT TRUST
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Windrush Aquatic
Environmental Consultancy

Windrush AEC Limited
Registered Office: The Cottage
Fordwells, Witney,
Oxon. OX29 9PP

Telephone: 01993 878573
Email: vaughan@windrushaec.co.uk

1. Introduction

This report is the output of a site visit undertaken by Vaughan Lewis, Windrush AEC Ltd to the Ewelme Stream, a small Thames tributary stream running through the village of Ewelme and Benson, Oxfordshire. The visit was undertaken on behalf of the Wild Trout Trust (WTT). Information contained within the report was obtained from observations on the day of the site visits and discussions with Dr David Solomon, Tom Stevenson and other local residents. Further information was taken from 'Our Stream. The story of the Ewelme/Benson Brook'[1].

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.

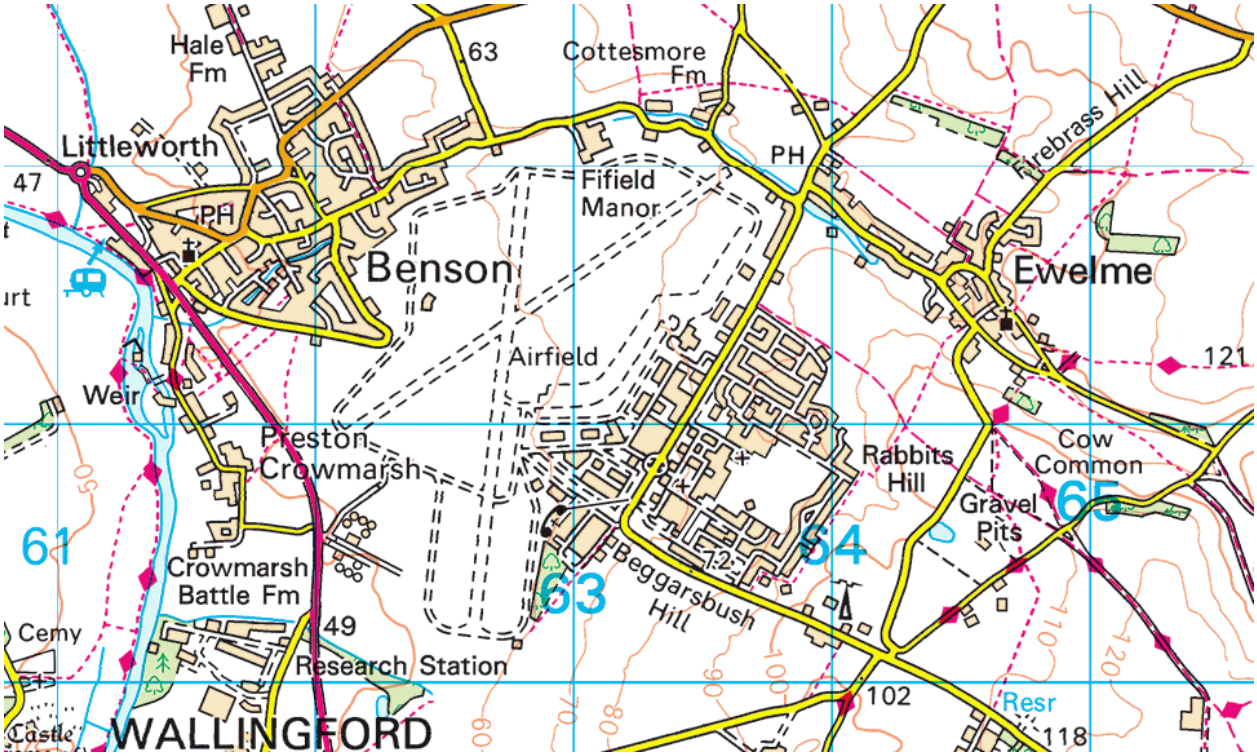

Figure 1: Ewelme Stream. Source to River Thames

2. Overview

The Ewelme Stream is a small chalkstream tributary of the River Thames running for some 3.6km from is headwater to its confluence. Being chalk fed, its flow is relatively stable, whilst water quality is not affected by any significant inputs of sewage or other pollutant, other than local road run-off.

The effective upstream limit of the stream is located at a small pond in Ewelme. Several small streams enter this pond, with varying degree of flow surety. The pond has been historically extensively modified, with a range of marginal habitats resulting. The upwelling of springs in the bed of the pond is clearly marked by a number of silt free gravel areas.

Figure 2: Pond at the effective perennial head of the stream

Downstream of the pond, the brook had a generally steep gradient, and a gravel dominated substrate within a heavily modified channel alongside the main road. The presence of shading walls along the LB and the lack of suitable marginal habitat combined to restrict the abundance of instream vegetation

Flows in the Ewelme Stream are recorded at an Environment Agency (EA) gauging weir. Commissioned in 1970 it has recorded flow data continuously, apart from a 4 year break (1976-1980). Mean discharge for this period is 0.045m^3/sec. Flow is typical of a chalkstream, being relatively steady albeit interspersed with some well-recorded flood events and droughts.

Figure 3: Channel within the village. Note gravel substrate and lack of vegetation

Figure 4: EA gauge weir

Downstream of the gauge weir, the bulk of the stream flow is channelled through cress beds. Owned and managed by the Chiltern Society, the beds are maintained to depict commercial production as practised here in the 19th and early 20th centuries. Despite the need to control flows and the heavy physical modification that accompanies cress production, habitat within this reach was surprisingly good with areas of silt-free gravel, water crowfoot *Ranunculus* Spp and of course water cress *Nasturtium officinale* amongst other marginal plants. Periodic cutting of water crowfoot takes place to prevent a mono-culture of this species and the consequent seasonal elevation of water levels.

There are some tensions regarding management of the beds, with the desire to 'tidy' the habitat leading to the unnecessary and damaging removal of sections of timber (Large Woody Debris - LWD) from the channels. Retention of LWD and the creation of brushwood berms would increase stream velocity locally, allow the development of marginal plants, promote scouring of gravel to the advantage of spawning brown trout and increase instream cover.

Figure 5: Cress beds

Leaving the village of Ewelme, the stream passes through a small nature reserve downstream of the site of an old mill. The channel is very wide here with the development of a series of braided channels beginning. The periodic removal of brushwood, accumulated sediment and growth of emergent/ruderal vegetation has prevented the establishment of vegetated margins and islands.

Figure 6: Downstream of the site of the old mill showing the partial development of vegetated berms and a braided channel

The channel runs alongside the main road adjacent to Benson airbase. There is a short section of very heavily shaded channel; in the summer very little light penetrates due to the extensive growth of bramble *Rubus fruticosus* and other plants. Whilst providing good cover from predation for fish, the reduction in ambient light has limited the growth of instream and marginal vegetation.

Figure 7: Dense bramble and thorn cover on LB of roadside channel

Mirroring this over-shading, a section of downstream channel had been over-manicured, with the total removal of riparian cover alongside a garden/small field. This lost cover had significantly devalued habitat on this short section of stream. There was also some significant RB erosion which threatened to undermine the road carriageway.

Figure 8: Overcutting on the LB of the channel reducing cover. Note also the closeness of the road to the stream

Further downstream and just before the entry into Benson village, a section of more natural channel provided a blue print for habitat quality elsewhere. Good bankside cover and excellent instream habitat, with abundant LWD combined to make this one of the more valuable sections of the stream with regard to its ecology.

Figure 9: Above Benson showing good instream habitat and bankside cover

Road run-off to the channel is an issue throughout its length with rudimentary grips and gullies posing a risk of mobilised sediment and pollutants entering the stream.

Figure 10: Road run-off piped directly into the stream

Figure 11: Accumulation of sand and fine sediment in an over-wide uniform section of channel

Further extensive modification of the channel has taken place alongside the main Benson run-way with a 266m long section of the river culverted due to the risk of bird strike to aeroplanes. Interestingly, the channel enters twin pipes under the culvert with the flow split nominally equally between the two. However on exit at the downstream end, the flow has become totally concentrated into one pipe, strongly suggesting some failure/and or blockage in one of the pipes.

Figure 12: Twin pipes forming a culvert alongside the main Benson runway

For much of the reach through the village of Benson the stream is heavily modified, running between residential property and the main road. Despite a general lack of marginal vegetation, instream habitat was often good, with significant stands of water crowfoot and abundant clean gravel substrate. Connectivity along the stream was also generally good, with most bridges/culverts allowing for passage of fish. There were however two small weirs/low impoundments at the upstream end of this reach that although not preventing fish movement may slightly impede it, leading to increased rates of predation. Brown trout were observed in this reach of the river.

An impassable weir at the site of the former Benson mill prevented any upstream fish migration, creating the possibility of a unique strain of brown trout upstream of the impoundment.

Below the mill, the stream passed through a number of large gardens. Habitat quality was variable, with significant opportunity for local enhancement, particularly of marginal habitat. Simple changes in bankside management, including adoption of a policy of 'benign neglect' would result in rapid improvements.

Towards its downstream limit the brook flowed through a small nature reserve. Habitat quality was generally much improved here with semi-natural banks. There was however some evidence of over-management, particularly of LWD which could usefully be left in place or indeed selectively introduced to the advantage of the stream's ecology.

Figure 13. Channel within Benson village. Note good instream habitat but limited marginal vegetation

Figure 14: Generally good habitat quality in the downstream nature reserve

The biology of the stream is well recorded. Monthly invertebrate samples taken as part of the Riverfly Partnership https://www.riverflies.org/show consistently good water quality, with freshwater shrimp *Gammarus pulex* dominant in most samples.

Fish stocks are restricted, with only three species recorded: brown trout *Salmo trutta*, bullhead *Cottus gobio* and ten spined stickleback *Pungitius pungitius*. An EA fish survey undertaken in 2016 captured a total of 73 brown trout in a 100m section of channel alongside the Ewelme to Benson road. There was evidence of good recruitment of fish, with the bulk of fish aged as 0+ or 1+. Local observation has confirmed spawning brown trout in the middle/upper reaches of the river.

3.0 Recommendations:

Opportunities exist to install marginal berms at number of locations along the length of the stream. Subject to flood risk, these could be constructed from brushwood bundles and backfilled with sub-soil to create suitable conditions for marginal plant growth. Details of these and other habitat techniques can be found on the WTT website https://www.wildtrout.org/content/wtt-publications website

A significant length of the stream flows alongside or through residential properties. Adoption of simple management prescriptions could significantly and cheaply improve ecology in the sections. Where possible, educate local residents about the benefits of LWD, and resist pressure to remove it from the channel. Subject to the necessary permits, consider adding LWD to those areas where flood risk allows. Promote the advantage of leaving a wide strip of riparian vegetation uncut; ecology will improve and protection from rapid bank erosion increase

Downstream of the site of the former Ewelme mill, a decision should be made to either consolidate the developing silt berms using brushwood bundles or to allow the site to develop naturally with no intervention

Subject to resources, it may be beneficial to consider some cutting of the dense bramble cover on the LB of the stream opposite Benson airbase to reduce shading of the channel

Where possible, work with local residents and statutory authorities to remove un-necessary obstructions to fish passage. These include small weirs, culvert sections and other barriers to fish movement, that also tend to have detrimental impacts on upstream habitat quality

Allow regrowth along the over-cut bank shown in Figure 8, or develop a planting plan for marginal vegetation to replace lost cover. Work with the local authority to prepare a scheme to protect both the river channel and the adjacent road

The culverted section of channel alongside the airfield could potentially be ‘skylighted’ by replacing the enclosed round culverts with a square section culvert with expanded mesh roof. It is not likely that this option would prove to be financially acceptable but may be possible in the event that the culverts need repair or replacement

Subject to approval by the WTT, and Covid regulations, it would be beneficial for them to run a 'Practical Visit' for local groups/individuals with an interest in managing habitat in the stream. The WTT can provide one or two staff members and materials to demonstrate how simple techniques can be used to optimise habitat for trout and a range of other species

The WTT administers a small pot of Thames Water 'River and Community' fund money that can be bid for annually by conservation orientated groups. It is suggested that a bid is made to this fund in 2022 for enhancement work to the Ewelme Brook

Note that all works to bed or banks of the river or within 8m of its banks requires the written consent from the Environment Agency under the Land Drainage legislation.

References:

1. Our Stream. The story of the Ewelme Stream/Benson Brook David J Solomon, Fluvial Books 2020