



Habitat Advisory visit to the River  
Cam, Sawston, Cambridgeshire on  
behalf of Spicers Angling Club.

Undertaken by Vaughan Lewis,  
Windrush AEC Ltd  
September 2005

## 1.0 Introduction

This report forms the output of a site visit to the River Cam, near Sawston, Cambridgeshire on 30 September 2005 on behalf of Spicers Angling Club. Information in the report is based on observations on the day of the visit and additional comments provided by club members and Environment Agency (EA) staff.

Throughout the report, normal convention is followed, with right bank (RB) and left bank (LB) of the river identified when looking downstream.

## 2.0 Fishery Description

The River Cam or Granta is a small chalkstream, rising south west of Saffron Walden and flowing north to join the River Cam or Rhee south of Cambridge.

The Cam was well known for its brown trout *Salmo trutta* (see *Chalkstream* by Charles Rangeley-Wilson), with individual fish in excess of 10 lb recorded historically. Spicers Angling Club controls some 3km of the river adjacent to the company's site at Sawston.

The River Cam had been subject to a 'weed raking' exercise by the EA prior to the advisory visit. This operation had effectively removed over 90% of the instream and marginal vegetation from the river, leaving the channel over-wide and lacking in any substantial vegetation cover. In addition, some silt and hard bed material had been removed and deposited on the river bank, along with the vegetation. This was apparently the first time in 9 years that this type of management had taken place in this reach of the Cam.



**River Cam showing channel devoid of vegetation following weed clearance**

The impacts of the weed removal were compounded by the low flows experienced during 2005. The channel was heavily incised (the result of previous dredging activity) and was some 6m wide, with a bed dominated by un-sorted sand and gravel, overlain in places with a layer of fine sediment. Bed profile was very homogeneous, with a generally shallow depth of water remaining. There was a shallow marginal berm on the RB, with the LB having a steeper profile.

Short sections of gravel dominated riffle habitat were present further downstream. Substrate in these sections remained unsorted and very uniform in nature. Some small stands of short, cropped Water crowfoot *Ranunculus* spp, were noted in the riffle sections. There was fringe of riparian trees on the RB, including crack willow *Salix fragilis*, goat willow *Salix caprea*, and alder *Alnus glutinosa*. Land use on the RB was dominated by the works in the upper fishery, with arable land on the LB.

The section of river adjacent to Ley Grove Bridge had not been extensively dredged or cleared of vegetation. As a consequence, the bed was dominated by relatively well-sorted gravel, with strong marginal growth of water cress *Rorippa nasturtium-aquaticum* and reed canary grass *Phalaris arundinacea*.



**Well developed marginal growth and moderately sorted gravel associated with un-dredged bed adjacent to bridge crossing**

Small stands of Himalayan Balsam *Impatiens glandulifera* were present in sections of the fishery.

Tree cover in the lower fishery was limited, with few trees on either bank.



### **Himalayan Balsam on the margins of the river**

One short section of the RB had been more carefully managed, with the EA having apparently cut the vegetation in a horizontal fashion, reducing the overall height of the plants whilst retaining the consolidated structure of the silt berm. As a result, the benefits of the narrowed channel to water velocity had been retained, whilst a strong regrowth of emergent vegetation was noticeable.



### **Retained sediment berm on the RB with associated strong growth of emergent vegetation**

#### **3.0 Fish Stocks**

Wild brown trout *Salmo trutta* were present in the fishery. No stocking has been undertaken in recent years. In addition, there were large stocks of coarse fish with chub *Leuciscus cephalus*, dace *Leuciscus leuciscus* and roach *Rutilus rutilus* noted. The EA had historically removed these by electrofishing, although no such management of this kind has taken place in recent years. No electrofishing survey data were available from the EA for this reach of the river.

#### **4.0 Recommendations**

There is little doubt that the recent extensive vegetation removal undertaken by the Environment Agency had significantly damaged the instream habitat of the River Cam. It is questionable why such extensive management work was necessary, particularly after a 9 year period where no management had taken place. The benefits gained to flood defence from intermittent weed cutting are dubious; recent changes in agricultural funding have reduced the value of crops produced on arable farmland. In addition, the EA nationally has recognised the benefits of attenuation of peak flood flows on agricultural land to downstream residential property. It is imperative that prior to the implementation of any management prescription aimed at improving riverine habitat, an agreement regarding the future management of the Cam should be reached with the EA. This agreement should be brokered at a high level, with the Area Manager or one of his Environment Managers endorsing the Agency's position regarding the future management of the River Cam at Spicers. Without such agreement, there is little benefit in seeking to enhance the fishery.

On the assumption that agreement is reached, the following courses of action could be adopted:

- Control of emergent vegetation in the future could be facilitated by the use of an herbicide, rather than damaging weed raking.

The only appropriate herbicide cleared for use near to and in water is glyphosate (sold as 'Roundup', Roundup Pro Biactiv etc). It is a selective, translocated herbicide that is used to treat the actively growing plant once its leaves have emerged from the water. Glyphosate offers a cheap and environmentally sensitive option (it is inactivated on contact with water and sediment) for the treatment of emergent vegetation.

Glyphosate can be used to selectively remove small stands of emergent vegetation, creating runs and sections of clear water where required. It can be also be used carefully in order to shift sediment from strategic locations by training the river's flow to scour these areas. Detailed advice on the use of herbicides can be obtained from the Centre for Aquatic Plant Management [capm.org.uk](http://capm.org.uk). The written consent of the Environment Agency is required for the use of glyphosate.

- Undertaking an electrofishing survey would be of great value in establishing a baseline for stocks present in the river. It is possible that the Environment Agency may be able to undertake this work. If not, they should be able to provide the names of fishery contractors who can.
- It is recommended that the practice of removing coarse fish by electrofishing be no longer practised. There is no evidence that this management option benefits the abundance or size of wild trout. It would be more productive and sustainable to exploit the recreational potential and financial value of the coarse fish by developing a coarse fishery during the winter period.
- The un-dredged and uncut section of the river adjacent to Ley Grove Bridge provided an exemplar of good quality habitat that should be used to inform future development of the fishery.
- Management prescriptions that could usefully be employed to optimise the fishery include the following:
  - The sorting of bed material and in particular spawning gravel could be further improved by strategic positioning of Large Woody Debris (LWD), in the form of tree trunks and limbs. These will from time to time naturally fall into the river. Unless flood defence requirements dictate, they should not be removed. Rather, they should be stabilised and trimmed to allow angling access whilst retaining the bulk of the woody debris in the river. LWD has a significantly beneficial role to play in increasing variation in bed profile, providing cover for a range of invertebrates and fish, and detaining leaf litter for subsequent consumption by shredding macroinvertebrates.

LWD can actively be encouraged into the river in strategic locations (generally on riffles or shallow glide areas) by selective felling of trees. Leaving a 'hinge' at the

base of the trees during felling will allow control of the placement of the timber, and will also act to stabilise the tree by keeping the tree butt attached to the bank. Ideally, the top of the fallen tree would be angled in an upstream direction in order to reduce the risk of bankside erosion.

- The lack of trees present on the lower reaches of the river should be addressed by planting of mixed species along the channel banks. These should include ash *Fraxinus excelsior* and hawthorn *Crateagus monogyna*. The likely presence of *Phytophthora* precludes the planting of alder. All trees planted will require substantial protection from grazing stock and deer.
- The few areas of gravel riffle present could be improved by sorting of the substrate in order to increase bed diversity and improve spawning conditions. There are a number of ways of doing this, with perhaps the best being the use of paired 'v' shaped wooden groynes. These are simple structures that can be constructed by staking a pair of large wooden logs to the bed in a 'v' shape, in the centre of the riffle, with the apex of the 'v' facing upstream. The upstream face of the paired groynes should be filled with large stone and gravel in order to reduce flow under them; the intention is to force water over the groynes, scouring the bed downstream.





**Paired wooden groynes in a small stream. Note downstream pool excavated as a consequence of flow constriction**

- Overhanging vegetation should be allowed to develop in order to provide valuable cover for, in particular, juvenile trout
- In combination with channel narrowing, bed raising should be used strategically in order to reduce the cross-sectional area of the channel, thus increasing water velocity. The creation of gravel-dominated riffles would also increase the availability of this valuable and under-represented habitat type. A range of species is associated with gravel riffles, including spawning/juvenile brown trout. In general, it is recommended that riffles should be constructed to be a minimum of 15m in length. Each riffle would increase the retained head, probably by between 15cm-30cm, with the extent of this backwater effect being assessed as part of the detailed design process.

Optimum conservation benefit is obtained if the depth of gravel in each riffle exceeds 50cm, with a range of macroinvertebrate species requiring a hyporheic zone of this depth to reproduce successfully. In order to optimise spawning conditions for brown trout, water velocity should be between 25cm/sec – 75cm/sec, with a water depth varied between 25cm and 60cm. Gravel and stone may need to be imported onto the site from the nearest quarry, with the price likely to be in the region of £10-15/tonne delivered. Alternatively, there may be a possibility of excavating gravel from the surrounding fields owned by Spicers. Careful selection of sites for excavation could yield an additional conservation benefit in the form of wetland scrapes, or permanent/ephemeral ponds. Such ecologically desirable outcomes could attract

funding under the Higher Tier of the Environmental Stewardship agri-environment scheme.

In conjunction with bed raising, localised excavation of the banks of the channel could be used both, not only to create low-level marginal shelves, valuable for a range of plants and invertebrates, but also to provide a degree of flood compensation (if required) for the introduced gravel. Careful design of excavated water features, low level berms and introduced gravel should ensure that they are not only ecologically beneficial but also neutral in terms of flood risk.

The cost and detailed planning required for the implementation of the recommended enhancements should not be underestimated. A sum in excess of £20,000 will be required in order to have a significant impact on even a single river reach. Given this, it is recommended that a partnership project should be promulgated, with likely participants including the Environment Agency, the Wild Trout Trust, landowners, and Anglian water. Funding may be available from any of the potential partners, and Landfill Tax, Aggregates Levy, or agri-environment schemes.

➤ The quality of the existing gravel can be improved by establishing a regime of cleaning spawning gravels each September. This can be achieved by either manual 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. It is important that the Environment Agency 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.

➤ The presence of Himalayan Balsam is undesirable. It is classified as an alien invasive weed species. It may be possible for the club to undertake limited control of the stands of balsam present in some areas of the fishery. Chemical control with the herbicide glyphosate when the plant is actively growing in early spring should be effective. Alternatively, the plants can be cut at ground level before the flowering stage (June) or they can be pulled up by the roots and disposed of by composting or burning unless seeds are present. Note that the use of glyphosate or any other herbicide on or near water requires the consent in writing of the Environment Agency.

- Note that all works to bed or banks of the river or within 8m of its banks require the written consent from the Environment Agency under the Land Drainage legislation. The introduction of any fish or eggs into any inland water and the use of electrofishing equipment both require the consent of the EA under the Salmon and Freshwater Fisheries Act, 1975. It is imperative that all relevant consents are obtained by the club prior to the commencement of any works.

- This report is produced for guidance only and should not be used as a substitute for full professional advice. Accordingly, no liability or responsibility for any loss or damage can be accepted by Windrush AEC Ltd as a result of any person, company or other organisation acting, or refraining from acting, upon comments made in this report.