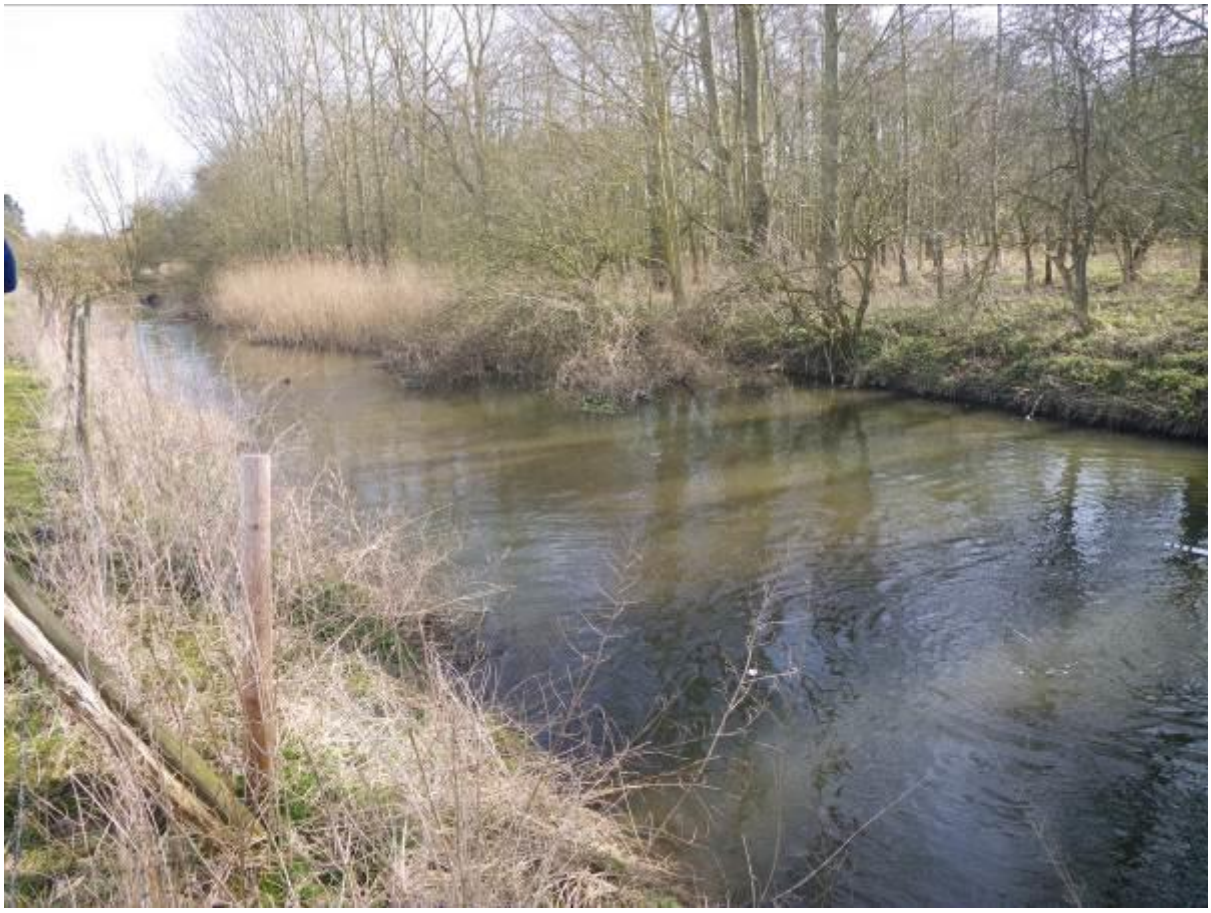
River Lark - Lackford



A Project Proposal by the Wild Trout Trust - April 2015

1. Introduction

This report is the output of a site visit to a 1km reach of the River Lark running downstream from Lackford Bridge, Suffolk. The reach inspected runs from the bridge at National Grid Ref TL787 710, down to the old lock at TL781 714.

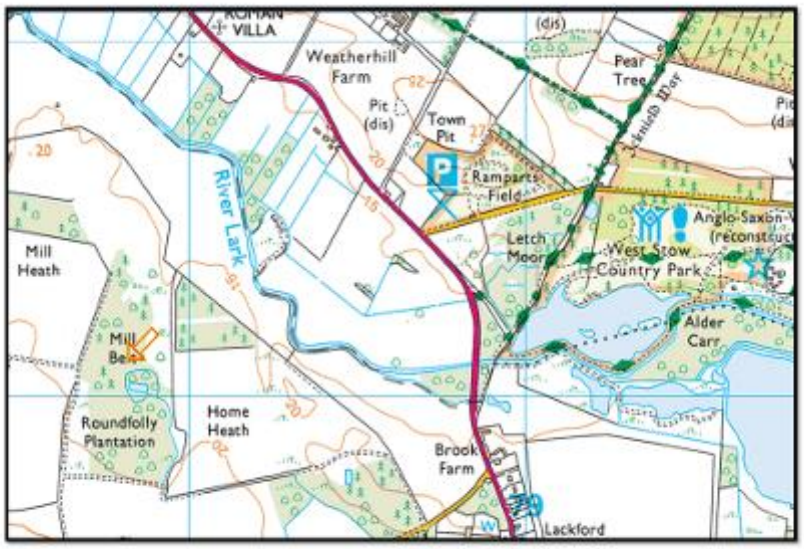
The Lark is classified as a Heavily Modified Waterbody with only moderate potential under the Water Framework Directive. Waterbody ID no. GB105033043051.

The visit was requested by Tim Tailor from the Lark Angling Preservation Society (LAPS) and James Hooker, Fisheries Technical Officer with the Environment Agency.

This length of river was subject to a WTT advisory report AV back in 2008. Since that time, the two local anglings clubs, LAPS and the Bury St. Edmunds Trout Club (BTC) who control fishing rights running either side of Lackford Bridge, have been working in partnership with the EA to deliver a range of habitat improvement works. This visit was designed to identify opportunities to restore favourable habitat mainly to the wide and featureless reach running immediately downstream of the bridge.

Comments in this report are based on observations on the day of the site visit and discussions with James Hooker and Tim Taylor and Glenn Smithson from LAPS.

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.



Map 1 River Lark at Lackford ©streetmap.

2. Catchment overview

The River Lark rises in a narrow band of late Cretaceous chalk. It drains northwest to the Fens, whereas the majority of rivers rising on this area of chalk drain to the east coast (e.g. Waveney, Deben and Stour), but in common with those rivers the catchment has relatively low rainfall compared to the chalk streams of Southern England, and hence the mean flow rates are comparatively small. Beyond the chalk headwaters, the Lark flows across a surface blanket of material that was deposited during the last half million years.

Long sections of the Lark, including the reaches controlled by LAPS, have been extensively modified in the past to facilitate navigation. Some of the history behind the construction and operation of the navigation can be found on the East Anglian Waterways Association website at: www.eawa.co.uk. Like many navigations constructed during the Industrial Revolution, the Lark navigation became largely derelict with the development of the railways during the late Victorian era.

Recently implemented river restoration works, designed by Dr. Nigel Holmes and sponsored by the EA, have transformed the BTC reach in the West Stow Country Park reach upstream. A further phase of work downstream of Lackford has also just been completed and the EA and LAPS are very keen to link up favourable habitat in order to boost local populations of flow loving, gravel spawning fish species. Early signs are that wild brown trout *Salmo trutta* are recruiting in this reach of the Lark and improving and linking habitat will help this small but viable population to grow.

3. Habitat assessment

The 400m reach running downstream from Lackford Bridge has changed little in the seven years since the WTT AV in 2008.

The river channel here is comparatively wide with a mainly shallow glide habitat over a bed of soft, silty sand with occasional thin gravels. Some beds of starwort, *Callitriche* spp., were observed and it is understood that this channel can become very weeded during the summer months. On some of the shallow marginal sections there were also beds of water cress, *Rorippa* sp. and marginal emergent vegetation, including burr reed, *Sparganium* sp. and sedge, *Carex* sp.

The LB is not controlled by LAPS and has in places fairly dense stands of tall trees including crack willow, *Salix fragilis* and poplar, *Populas fastigiate*. There was also the odd goat willow, or sallow, *Salix caprea.* This species is extremely valuable as a riverside tree, providing low bushy cover at water level. Goat willow can provide much needed low scrubby marginal cover, which is vital in providing fish with a refuge from predators and as a source of terrestrial food items. Tree shading is also useful in moderating the success of in-channel weed growth, which can sometimes be an issue, particularly when plants become established in mid-channel locations.

The RB, like so many other reaches of the Lark, was high and comparatively hard in nature, suggesting that it is probably made up of previously dredged river bed materials.

Throughout most of the reach, the flow was smooth and laminar. Adult trout lying up on smooth glide habitat often require a very close bolt hole if they are to take up residence and remain comfortable. It is possible that during the summer months weed beds provide decent cover to enable some adult trout to hold station.

Attempts have been made to promote more in-channel diversity through the introduction of current deflectors. Although useful, these appear to be quite small and are not really big enough to promote local scour and hence useful holding habitats for trout.

A short distance downstream of the bridge (photo 1), a fallen tree is providing some valuable habitat and promoting some scour in the river bed. However, most of the reach is wide, flat and comparatively featureless.

This straight and uniform stretch of river has huge potential for employing the river redistribution methods (dig and dump) pioneered by Dr. Holmes and successfully utilised in the reach above. Although the gradient of the river is modest, it would be possible to create a sequence of pools and associated runs to radically change the morphology of the channel and promote a more diverse ecology.

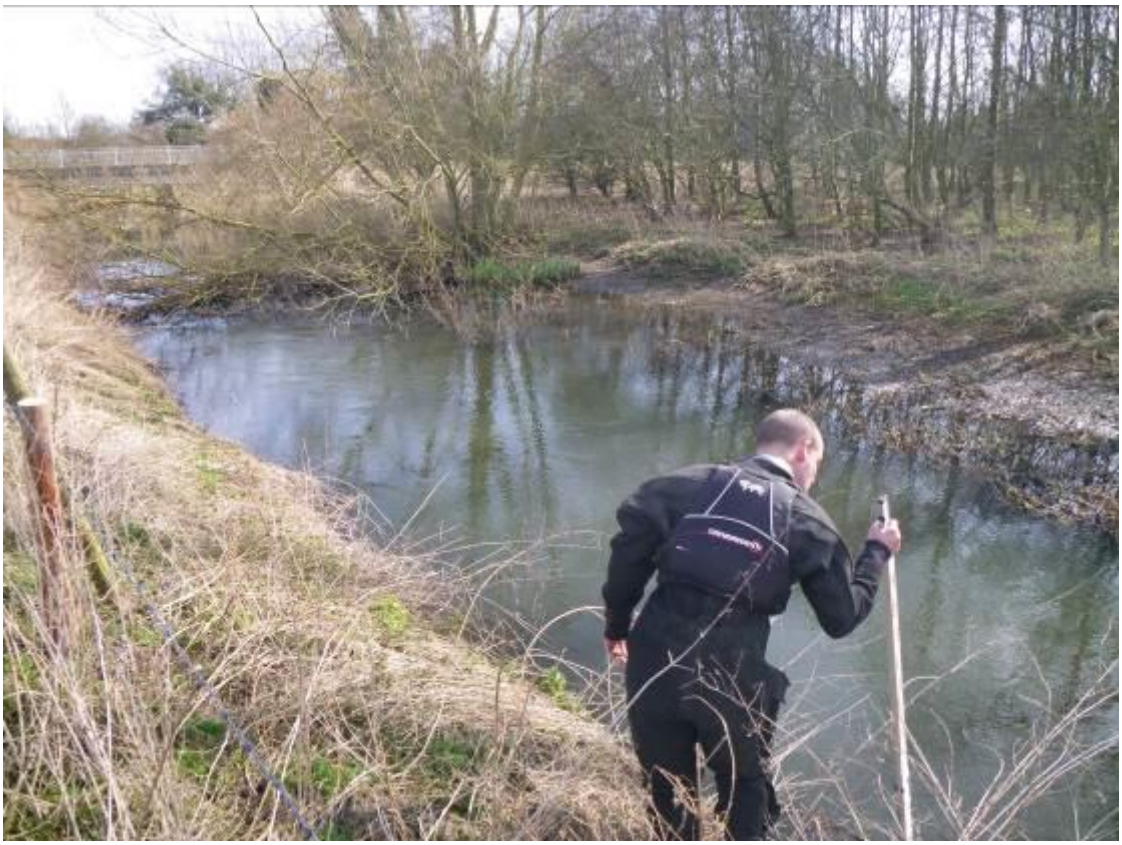


Photo 1 A fallen tree just downstream of Lackford bridge is promoting some valuable habitat on what is otherwise a bland reach of river.

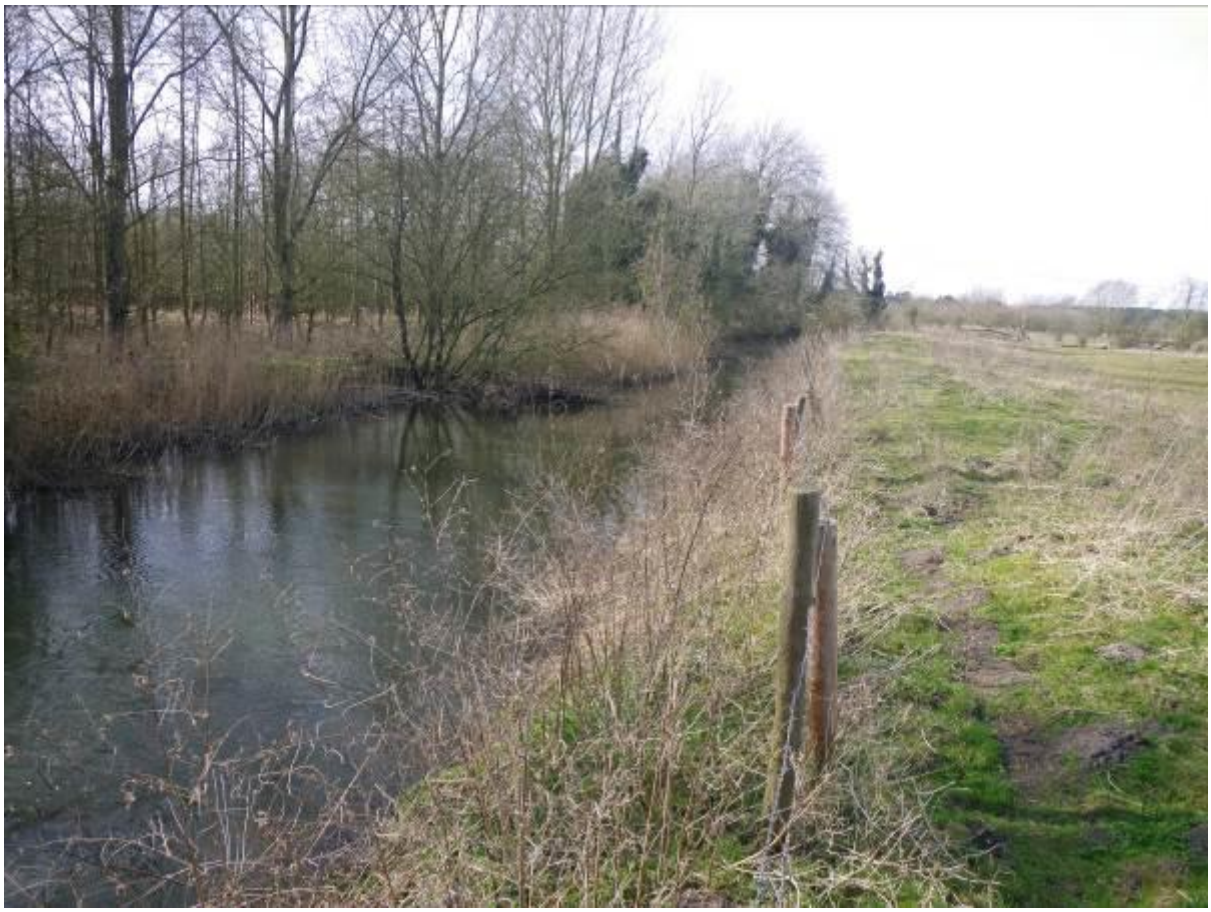


Photo 2. The target reach for enhancement looking downstream away from the bridge.

Channel shading is a significant issue on the first 400m of channel and options to reduce the tree canopy in the plantation adjacent to the LB should be explored with the land owners.

Further downstream the channel enjoys a slightly more sinuous planform and coupled with more direct sunlight, which has promoted the establishment of significant beds or emergent plants, including burr reed, reed mace, *Typha latifolia* and Norfolk reed, *Phragmities* sp. has helped to squeeze the channel width and promote more varied and valuable in-channel habitats (photo 3 and 4).

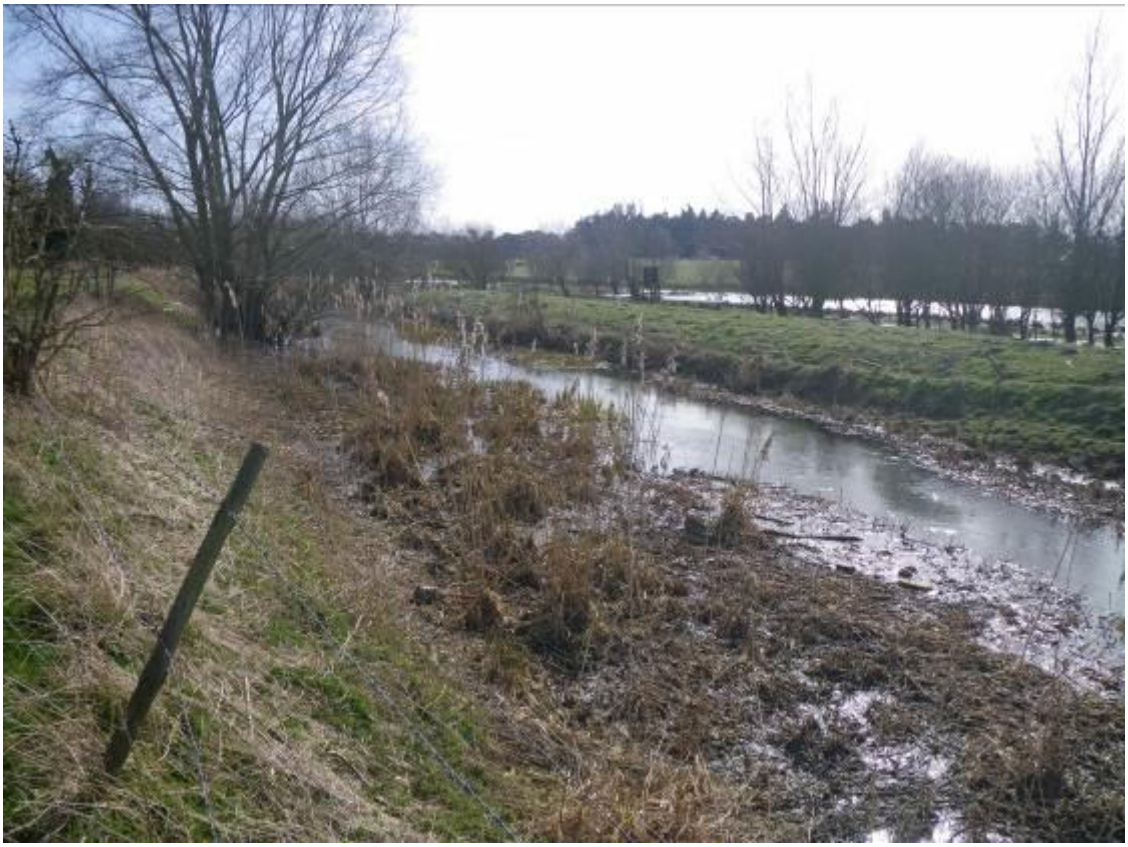


Photo 3. Low, wet berm of emergent plants squeezing the channel.

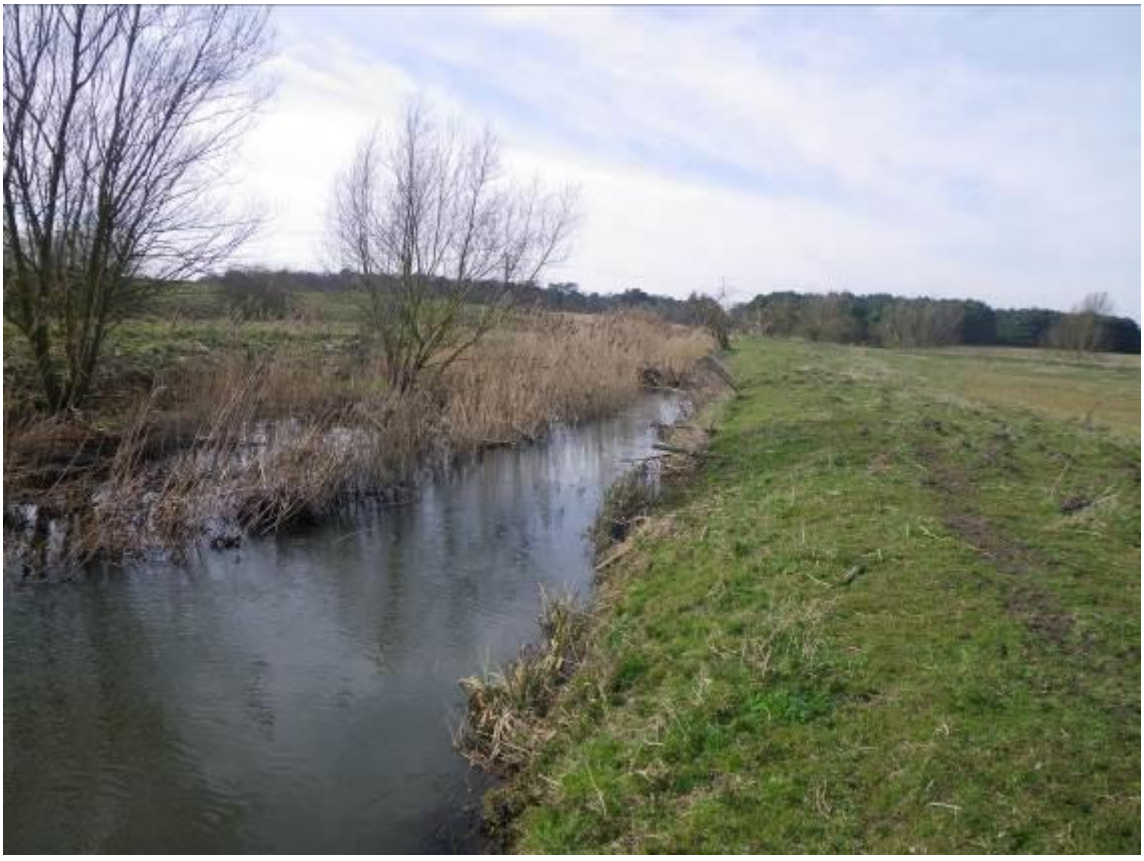


Photo 4. Norfolk reed protecting the banks and providing valuable habitat.

At some time in the recent past, this whole section of river has been fenced to exclude livestock but that fencing has now largely gone. Livestock have access to a safe drinking bay (photo 5) though there was little evidence of serious bank damage associated with livestock; however, improving and extending the drinking bay to create a combined backwater habitat, as well as a safe drinking bay, is worth considering as part of any restoration plan.

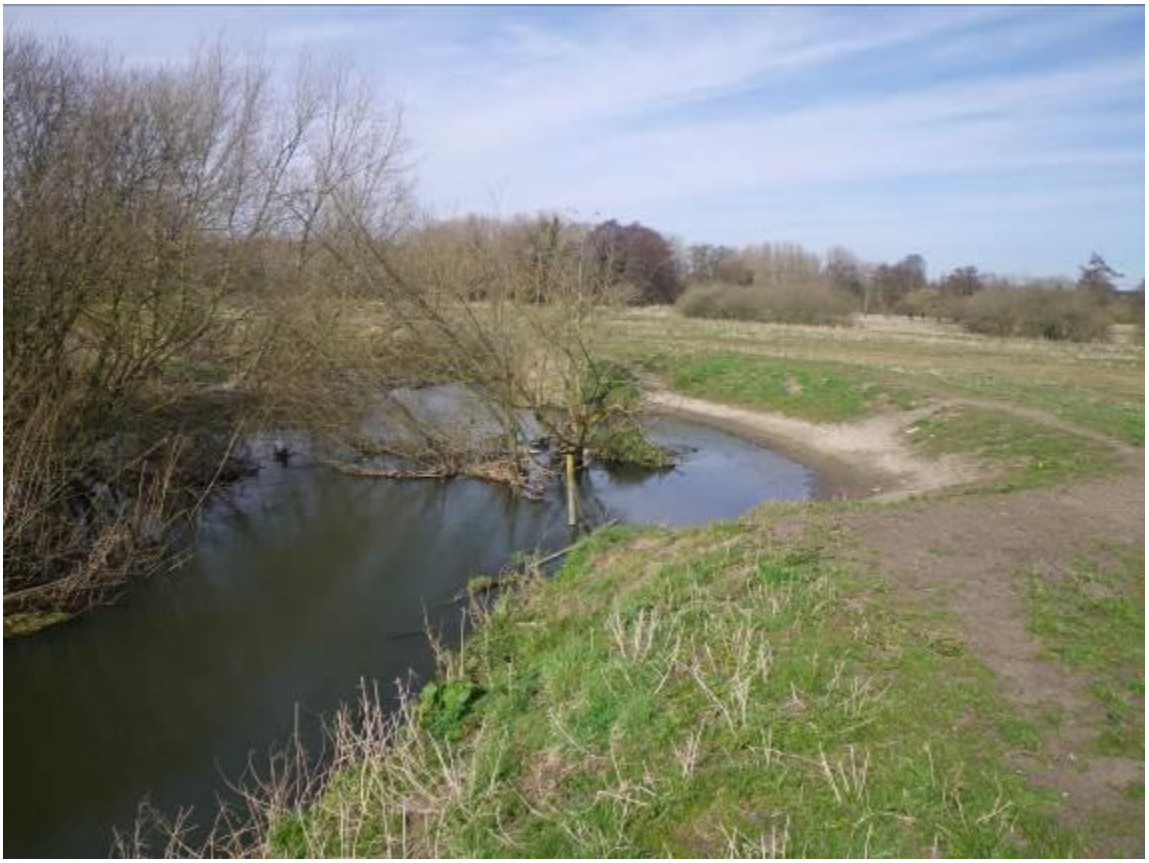


Photo 5. Drinking bay could be extended to create a backwater habitat.

A short distance downstream an impoundment in the bed level is caused by the remains of the old lock gates (photo 6). It is recognized that the lock itself has industrial archeological significance. Removing, notching or lowering the boards will help to develop improved habitat quality in the reach running upstream. It is understood that James Hooker is investigating the possibility of modifying the structure to win valuable bed gradient that will help with any enhancement initiatives in the target reach.

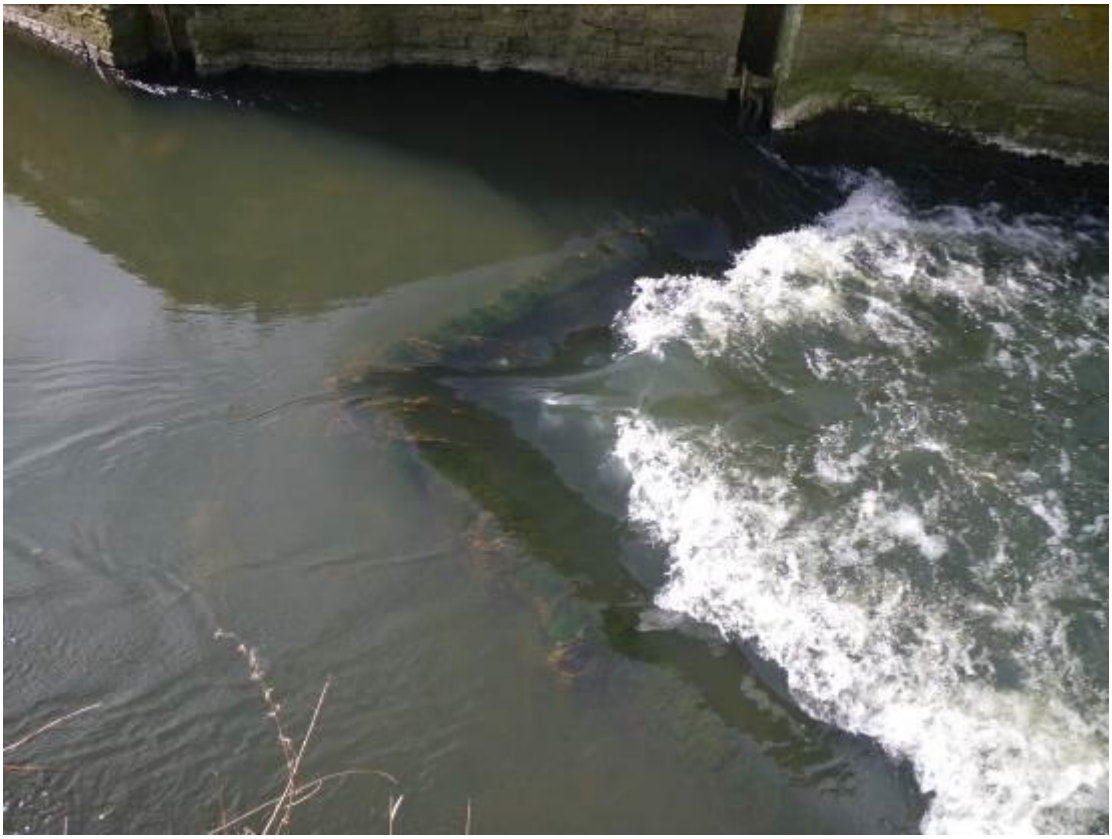


Photo 6. The old lock gate base impounds the reach upstream.

4. Habitat improvement options

A range of enhancement initiatives could make a huge difference to habitat quality in the target reach.

The largest gains can be achieved on the top half of the reach through employing the "dig and dump" technique to create a sequence of pools and runs. The presence of significant numbers of water vole burrows locally will limit any opportunities to use "cut and fill" techniques; the assumption should be that voles are present and work around them.

The key objective will be to create much needed diversity in the shape of the river bed to promote more varied flow patterns and velocities. To this end, using excavated bed material to create a flume, or throat, to each pool and then shaping the runs with imported local Lark valley gravels will not only provide improved holding habitat for large adult fish but potentially also provide opportunities for spawning and juveniles.

It is possible to create up to a maximum of eight key features using a long reach excavator. Approximately 10 tonnes of imported 20-40mm mixed gravels would be required at each location to ensure the pool tails retain a natural shape and function for spawning. It might be possible to include large tree trunk deflectors into the design of the features subject to landowner permissions and EA consents. Where vole burrows are present, a narrow gutter must be left between the existing bank toe and the creation of any side berms.

The meandering section between the long straight and the cattle drink works well but could be enhanced further with some tree planting to promote some local shade and control emergent vegetation.

Opportunities to create a valuable habitat for coarse fish fry and invertebrates exist with the possible extension of the existing drinking bay. Some of the materials won from excavating the bay could be usefully won to build up the berms proposed for the reach upstream. The issue of stock fencing to deter animals from crossing the river, or trampling vulnerable habitat should be discussed at an early stage with the land owner/tenant.

If permissions can be secured, any lowering or removal of the old lock gates will improve habitat quality in the reach above the old lock site.

5. Project actions and budget

- **Create pool and run sequence on top 400m reach using a tracked 360 and imported gravels**
  Plant hire, 80 tonnes of 20-40mm gravels
  Budget required £4k

- **Excavate cattle drinking bay plus tree planting**
  Budget required £1k

- **Remove lock gates. EA action**

- **Tree works and tree planting**
  Budget depends on the scope of works, recommend discussing scope of work with landowner and seek quotations from Forestry Company

- **Stock fencing. Discussion with landowner required.**
  Budget potentially up to £6k for entire reach

- **WTT project design, FDC application, project management and site supervision**
  Budget required £1.5k

Acknowledgement

The WTT would like to thank the Environment Agency for supporting the advisory and practical visit programme.

Disclaimer