



## **River Lark – Three Arches**



**A Project Proposal by the Wild Trout Trust - April 2016**

## 1. Introduction

This report is the output of a site visit to the River Lark near Icklingham on the reach known locally as Three Arches, or Farthing Bridge. The visit was commissioned by the Lark Angling and Preservation Society (LAPS) to explore options for a river habitat enhancement project. This particular reach of the Lark was identified as having poor habitat quality in a WTT Advisory Report carried out in 2008. Habitat enhancement projects have now been completed on stretches of the Lark both upstream and downstream of this site and the Environment Agency (EA) and LAPS are very keen to see this section of river improved to continue the progress made in improving the habitat quality of the Lark.

The Lark is classified as a Heavily Modified Waterbody with only moderate potential under the Water Framework Directive. Waterbody ID no. GB105033043051. The site visit covered a 1km reach running upstream from National Grid Reference TL 774723 to TL 779717.

Comments in this report are based on observations on the day of the site visit and discussions with Mr. Tim Taylor and Glenn Smithson from LAPS and Mr. James Holliday and Mr. Tim Handford representing the Elveden Estate. Additional information was obtained from Mr. James Hooker 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.



Map 1 River Lark Three arches reach. ©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](http://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 Bury Trout Club's reach of the Lark in the West Stow Country Park. Two further phases of work at Temple Bridge and more recently downstream of Lackford Bridge on waters controlled by LAPS have also been completed and the EA and LAPS are now 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 important population to grow. In addition, The Cavernham Mill Stream is also known to be a viable spawning and nursery site and discharges in the middle of the Three Arches reach. Creating improved adult trout holding habitat in this section will ensure that wild trout production emanating from the Mill Stream is retained and will significantly contribute towards boosting the River Lark trout population as a whole.

## **3. Habitat assessment**

The whole reach running upstream from Three Arches Bridge can be categorized as deep, slow-flowing glide habitat. The reach was historically heavily modified as part of the old navigation channel and it is likely that the river was also routinely dredged during the latter half of the last century. The net result is that the river channel lacks any significant diversity in width, depth or flow patterns.

Some reasonable habitat is provided by the root systems of a handful of LB bank-top trees (photo 1) and also from cover provided by some limited stands of marginal emergent reeds (photo 2). In the most part, however, the channel itself is devoid of high quality habitat for fish and invertebrates (cover photo).





Photo 1. A handful of trees lining a short section of the LB provide some limited cover.



Photo 2. Some decent stands of emergent reeds provide some cover on the RB. Note the subsurface shelf of fine sediment deposit adjacent to the LB.

There is evidence of significant deposition, with some sections of channel supporting submerged berms of deposited fine sediment reaching out to half way across the channel. This is a clear indication of the river very slowly trying to readjust to decades of intensive channel maintenance work.

Currently the channel is in very poor shape and chronically lacks any significant variations in depth, width or flow patterns. The soft, unstable nature of the bed substrate, coupled with the chronic lack of cover make this reach a hostile environment for aquatic plants, invertebrates and fish.

#### **4. Habitat enhancement options.**

The proposal is to introduce much needed diversity into the shape of the channel through a combination of river bed redistribution, import of gravels and large woody material stub deflectors. The prescription is largely similar to that used in the first three phases of Lark improvement works, which have proved to be very successful and stable.

No work is planned for the first 100m of channel above the bridge and there will also be a 25m exclusion zone either side of a major sewer crossing (photo 3). In total it is proposed to enhance a length of approximately 800m of river channel. It is assumed that water vole will be present throughout the entire reach, which will exclude any options to "cut and fill" from either margin. The method proposed is to create a sinuous sequence of deeper pools and shallow runs by locally squeezing the channel width using a combination of pegged-down alder trunks won from the adjacent ditch line (photo 4) and back filled with existing bed material to create both deeper central channel pools and emergent berms with narrow gutters to avoid any possible damage to existing vole habitats. It is proposed to introduce angular river gravels obtained from the nearby quarry to shape a shallow run-out, or tail to each new pool feature, as well as armouring the neck to create a self-cleansing flume.

It is proposed to work in harmony with the existing planform where possible and where the channel is already too straight, introduce sinuosity by alternating marginal berms from both LB and RB. Where there is a need to key in large woody material to the bank, it is proposed to employ the services of a qualified water vole surveyor to help identify burrow free locations.

In all it will be possible to create up to a maximum of ten pool and run features over the entire 800m target reach.

A large long reach 360 machine will be required. It is envisaged that a minimum of 10 tonnes of imported gravel (20-40mm mixed rejects) per pool and run feature will be required.

The project work will necessitate working outside of bird breeding and fish spawning seasons and during a period when ground conditions are firm.





Photo 3 Large service crossing thought to be a trunk sewer.



Photo 4 Ditch line with possible source of large woody material for stub deflectors or dragons teeth

## **5. Making it Happen**

The WTT can provide further assistance to help implement the above project proposal. This includes help in preparing a project proposal with more detailed information on design, costs and information required for obtaining FD permits to carry out the works.

The budget for delivering this phase of works would be in the order of £9000.

Hire of long reach exactor and tractor and trailer £4500

100 tonnes of gravel @ £25 tonne. £2500

Flood Defence Permit, Project management and site supervision £2000

### **Acknowledgement**

The Wild trout Trust would like to thank the Environment Agency for their continued support of the advisory visit service.

### **Disclaimer**

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