

River Wensum Restoration Strategy

Lenwade Mill to Wooden Footbridge, Lenwade – Reach 10a

At a glance

River restoration benefits: Improved planform, flow variation and sediment processes.

Drivers for restoration: Addressing the physical modifications of the river to meet the requirements of the Water Framework Directive; restoring the River Wensum Special Area of Conservation (SAC) to 'favourable' condition; contributing to the chalk rivers Biodiversity Action Plan; enhancing the value of the fishery.

Area restored: 1.4 km of the River Wensum from Lenwade Mill (National Grid Reference TG 10169 18210) downstream past Porter's Lane Road Bridge to the wooden footbridge (National Grid Reference TG 11091 18409).

Environmental impact assessment: No statutory EIA required. As best practice an Environmental Action Plan has been produced.

Project Partners: Natural England, landowner.

Construction period: August – October 2019.

Site detail

This scheme is part of implementation of the River Wensum Restoration Strategy (RWRS). The River Wensum in Norfolk is nationally and internationally important for wildlife.

The ecological value of the river is recognised through its designation as a Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC).

The RWRS is a whole river project that has been developed by the Environment Agency, Natural England and the Water Management Alliance. The aim is to implement a range of restoration techniques to improve the form and function of the Wensum to enable it to support the flora and fauna typical of a Norfolk chalk stream.

The Lenwade scheme (Unit 53, Reach 10a from the feasibility studies) covers 1.4km of channel, from Lenwade Mill downstream to the wooden footbridge which crosses the river downstream of Porters Lane Road Bridge.

The conceptual designs contained within the feasibility study for Unit 53 of the SSSI (Lenwade Mill to Taverham Mill) have been used as a starting point when developing the detailed design. The scheme has to be compatible with the recreational land use of the adjacent floodplain.

The key existing conditions which influenced the restoration measures included bank erosion, heavily shaded river corridor, lack of in-channel woody material and limited off-channel refuge areas. The Mill pool downstream of Lenwade Mill provides good habitat and for this reason no works took place upstream of the Fakenham Road Bridge.

Woody material has historically been removed from many of our watercourses as part of routine river management. However, there is an increasing realisation that timber, together with smaller twigs and branches, are an essential ingredient of healthy river systems. Wood in rivers can increase local flow velocities, thereby helping to keep areas of gravel bed clean of sediment and suitable for fish spawning. It provides cover and habitat for invertebrates and fish, including areas of slack water during times of high flows. Management attitudes are changing, and now wood is only removed routinely in situations where it would cause an unacceptable flood risk. The scheme includes the installation of woody material features to help stimulate variation in the flow regime and help restore the natural form and function of the channel.

On areas of river bank showing signs of erosion, which are mainly located on the outside bends, we have pinned brushwood faggots approximately 0.5m from the bank. Using an amphibious excavator the river bank has been re-profiled to provide a gentler more natural bank angle encouraging wetland marginal vegetation to establish. Transplanting existing bank side vegetation and pinning Geojute 500 (a biodegradable low carbon geotextile) on recently seeded provided protection from high flows experienced immediately after the works were completed.

The strategic aim of providing backwater refuge areas has not been practicable. On this reach there is insufficient space within the floodplain due to the numerous fishing lakes and dense woodland. The accumulation of dredged spoil on river bank between the Fakenham Road and Marriott's Way Bridge would have created significant spoil which would require expensive off-site disposal. The woody material features and establishment of marginal vegetation will provide backwater refuge habitat.

Access for large plant and machinery has been restricted because of the adjacent floodplain lakes and trees. As a result the majority of the works has been completed by hand. An amphibious excavator has been used downstream of Porters Lane Road Bridge to re-profile the river bed / bank and assist installing woody material features.

We completed a comprehensive flood modelling study which concluded that the restoration work has no impact to developed land, or people and property. The study demonstrated no impact to land located upstream and downstream of the works.

Environmental initiatives

The design philosophy aims to maximise the ecological potential of the present day system by kick starting natural processes. The proposed restoration measures will act as a catalyst, enabling the river to return to a more natural form and function, benefiting local ecology and target communities.

No waste material has been taken from the site, thus reducing the potential effects on local traffic as well as reducing the carbon impact of the scheme.

The faggots and stakes used on this scheme were obtained from the Norfolk Wildlife Trust as part of the woodland management at Honey Pot wood.

Environmental benefits

The restoration scheme has increased the habitat and flow diversity which will benefit a number of environmental receptors including:

- Geomorphology – naturalisation of river form;
- Fish and aquatic invertebrates;
- Aquatic plants (water crowfoot plant communities);
- Water vole;
- Otter.

In so doing, the restoration scheme has contributed to the SSSI and SAC achieving favourable ecological condition, has contributed towards attainment of Good Ecological Potential under the Water Framework Directive, and improved the local landscape character.



Amphibious excavator re-profiling bank profile.



Steep banks suffering erosion has been re-profiled to encourage marginal vegetation to establish.