

Reducing sediment ingress at Broomscot Common, Norfolk

1. Introduction

Broomscot Common, a County Wildlife Site in the Little Ouse and Thet Catchment, is linked to the Little Ouse River by Broomscot Stream, a small watercourse that flows from the Common through Garboldisham Old Fen to the Scarfe Meadows.

The Little Ouse River has been classified as 'moderate' for phosphate, according to Water Framework Directive (WFD) measures in 2016. Sediment is a major vector for the transport of nutrients (including phosphate) due to its high surface area, which provides ample opportunity for the sorption of dissolved constituents (Cooper et al., 2015b).

As such, the Stream, with sustained high sediment concentrations, has been identified as a potential contributor of pollution to the Little Ouse River (Figure 2).

The Little Ouse Catchment

- ❖ **Watercourses:** The upper reaches and tributaries of the River Thet and the River Sapiston extend as far as Attleborough and Elmswell before their confluences with the Little Ouse at Thetford and Euston. The Little Ouse flows on to the South Level just north of Lakenheath.
- ❖ **Characteristics:** The Catchment is characterised by Breckland and woodlands with varied land use including forestry and agriculture. The catchment is important for internationally protected species and habitats including eel (*Anguilla anguilla*), otter *Lutra lutra* and water vole (*Arvicola amphibius*), as well as one of the few remaining populations of the native white-clawed crayfish (*Austropotamobius pallipes*) found within the River Thet.

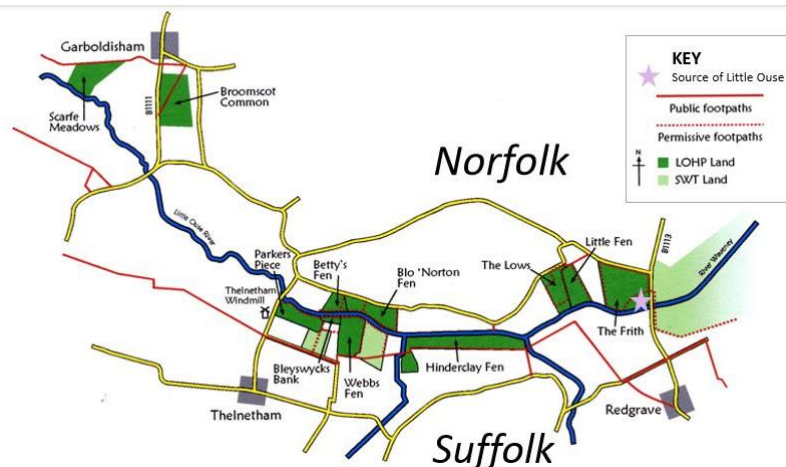


Figure 1. Location of Broomscot Common (credit: LOHP).

Broomscot Common, Breckland, Norfolk

- ❖ **Location:** Little Ouse Catchment (grid reference TM 0045 8060).
- ❖ **Size:** 11.4 hectares.
- ❖ **Habitat type:** A mixture of habitats, ranging from wet fen at the north end of the site to very dry, sandy grassland.
- ❖ **Ownership:** This land is leased and managed by the Little Ouse Headwaters Project (LOHP), who manage various parcels of land in the Little Ouse Headwaters.



Figure 2. Sediment is deposited in the Stream at Broomscot Common (right).

2. An opportunity for improvement

The area around Broomscot Common contains an extensive network of ditches, which all feed into the Stream (Figure 3).

From undertaking risk mapping and walkovers, it was clear that the surrounding agricultural fields were a main source of sediment due to run-off and erosion, with drainage channels acting as a major pathway for land-to-river sediment transfer (Figure 4). Therefore, the Water Sensitive Farm (WSF) Adviser decided that focusing mitigation efforts at the Common would be a key step in improving the water quality of the Stream, and ultimately the Little Ouse River.



Figure 3. Drainage network around Broomscot Common. Blue triangle = Broomscot Stream.

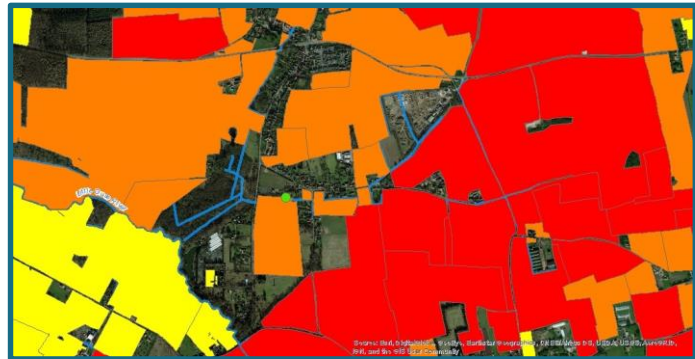


Figure 4. Risk of sediment and phosphorus run-off from fields (red fields = high risk for run-off, through to orange and yellow, and green = low risk). Green circle = two sediment ponds sited here.

3. Opportunities and mitigation work

Two sediment ponds, connected to the main stream, were installed to capture eroded soil and prevent the sediment from reaching the Stream (Figure 4 and 5). The sediment ponds will slow the water, thus encouraging the sediment (and attached nutrients) to settle to the bottom of the ponds. These can then be occasionally dredged out, and the material obtained can be put back on the land (Table 1). Once vegetated with aquatic plants, the suspended sediment and nutrients will be filtered further.

| Intervention | Area drained (hectares) | Area drained (m ²) |
|---------------------|-------------------------|--------------------------------|
| Sediment pond 1 & 2 | 220 | 2200000.0000 |

Table 1. Intervention drainage area for silt traps.

These measures provide wider cost-benefits in that they can reduce the need for river dredging. Furthermore, the works deliver ecosystem services in that they can reduce the risk of localised flooding, acting as a form of Natural Flood Management (NFM) by slowing water movement. The ponds also create new habitats for invertebrates, fish and macrophytes.

4. Next steps

WSF advisers are looking to build on this project by working with landowners upstream of the site. This will enable further opportunities for reducing land-to-river sediment transfer to be identified.



Figure 5. Sediment pond.

A collaborative, multi-partner project

This work was supported by the Water Sensitive Farming initiative and funded by ASDA. It demonstrates how we can work better with nature to improve water quality. Norfolk Rivers Trust would like to express their thanks to the Little Ouse Headwaters Partnership for enabling this work to take place.