

Run-off mitigation at Home Farm, Sennowe Park



1. Introduction

In the Summer and Autumn of 2019, and in partnership with the [Upper Wensum Cluster Farm Group](#) (UWCFG), a Water Sensitive Farming Adviser from Norfolk Rivers Trust carried out a farm visit at Home Farm, Sennowe Park, which forms part of the Wensum Sub-catchment within the Broadland Rivers Management Catchment (Figure 1).

The partnership was approached by the Farm Manager of Home Farm, who was interested in exploring mitigation opportunities for run-off that was occurring from sloped agricultural land and a farm track, as well as from nearby road verges. The run-off was converging in a straight ditch, which acted as a significant flow pathway to the River Wensum (Figure 2).

Due to the combined scale of the run-off, draining a catchment area of 152 hectares, the proximity and hydrological connectivity of the River Wensum, and the strong willingness of the Farm Manager to address the issue, Home Farm was selected as a priority for action.

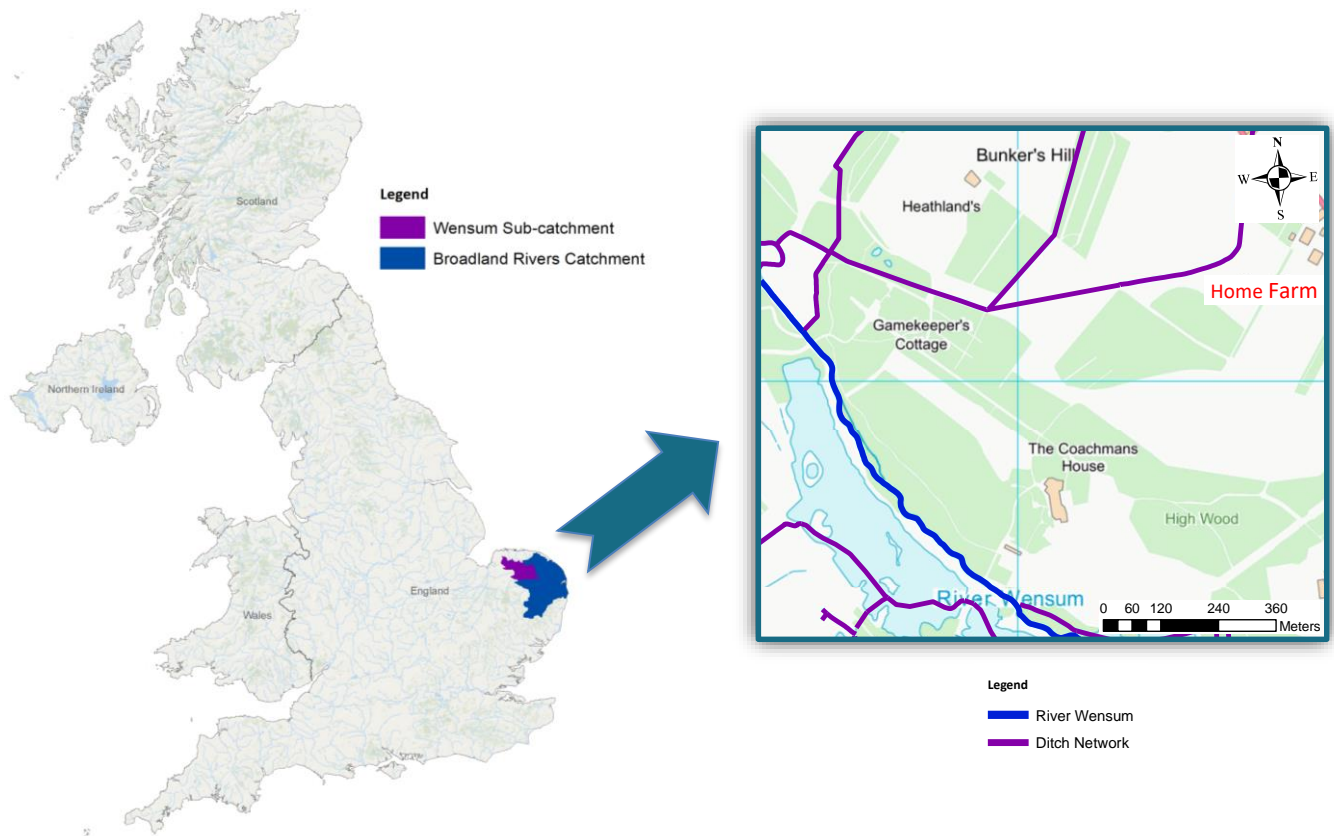


Figure 1. Location of Broadland Rivers Catchment, Wensum Sub-catchment, and Home Farm.

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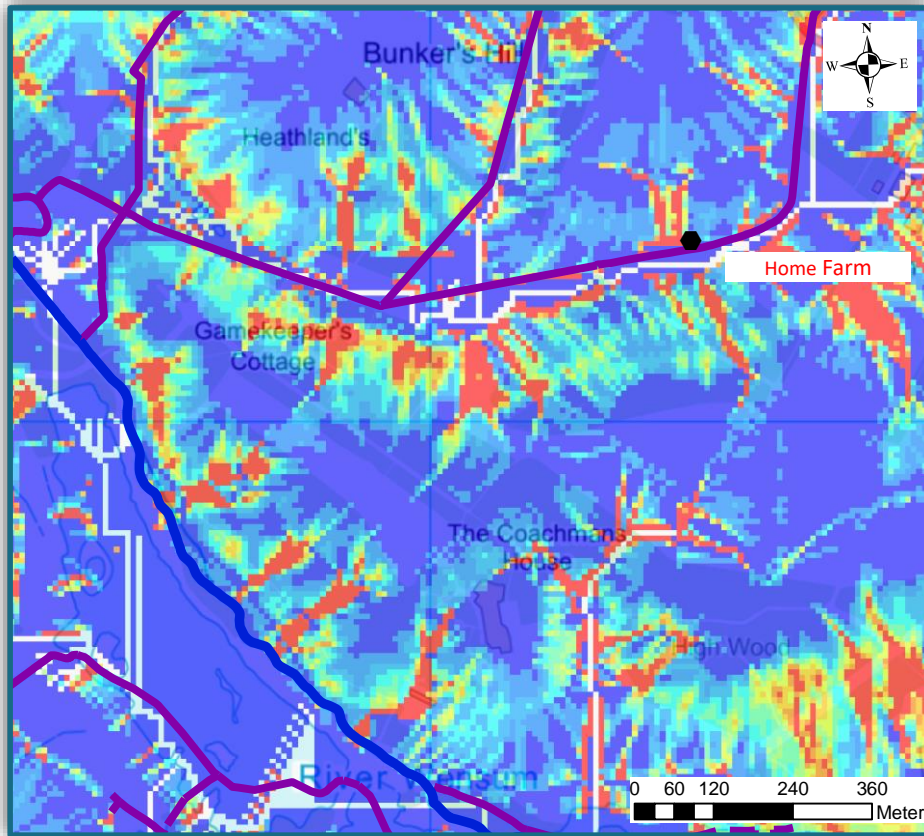
Home Farm at Sennowe Park, Guist, Norfolk

- ◆ Size: 1,400 hectares.
- ◆ Land use: Sugarbeet, potatoes, cereals and outdoor pigs.
- ◆ Catchment: Wensum.
- ◆ Topography: Long gentle sloping.
- ◆ Soil type: Consists of deep coarse and fine loamy soils, with some sandy soils.
- ◆ Designated zone: The farm holding sits within a Nitrate Vulnerable Zone (NVZ) for surface and groundwater.

The Wensum Catchment

The River Wensum is the largest chalk-fed river in Norfolk. Winding its way for 30 miles through rich agricultural land and various urban areas, it starts between the villages of Colkirk and Whissonsett, before merging with the River Yare on the south-eastern edge of Norwich.

The Wensum is designated as both a Site of Special Scientific Interest (SSSI) and a Special Area of Conservation (SAC).



Legend




-  Water Intervention
-  River Wensum
-  Ditch Network

Figure 2. The SCIMAP model identifies areas that are at greatest risk of sediment erosion. (SCIMAP: red = greatest risk and blue = lowest risk). Contains OS Data © Crown copyright and database right 2018.

2. The solution

It was decided that a three-part water intervention (Figures 3 and 4) would be installed, and this was constructed in October 2019 on farmland belonging to Home Farm at an approximate cost of £10,000.

The intervention works by directing run-off flow from the ditch and into the first of three lagoons. This reduces the flow velocity of the run-off, and enables the suspended sediment to settle out. The run-off then slowly leaks through leaky log dams that connect to the other two lagoons; the second and third of which act as final wetland 'filters', capturing the remaining finer sediment particles and soaking up any attached nutrients. After seeping through a final leaky dam, the cleaner water re-joins the ditch network.

Once the works have settled, the second and third lagoons will be planted with native wetland plants, creating a new habitat for nature. The lagoons will be periodically emptied by the farmer, and the valuable topsoil and any attached nutrients will be returned to the field where it will benefit the farm. Draining a large area of land, the intervention will also hold back water in wet periods to form a Natural Flood Management (NFM) feature, and this will return (replenish) about 80,000 m³ of water back to the environment; equivalent to 30 Olympic-sized swimming pools.



Figure 3. Before work took place on the ditching.



Figure 4. After lagoon construction (December 2019, pre-planting).

3. Monitoring

Over the next few years, monitoring will be carried out on the lagoons to assess the overall effectiveness of the works:

- ❖ The total amount of accumulated sediment (m^3) will be measured in the first lagoon on a six-monthly basis.
- ❖ Water chemistry will be tested on a monthly basis at the inlet and outlet of each lagoon. Water quality tests will measure the ammonia, nitrate, phosphate, pH and suspended sediment.
- ❖ Fixed point photography will be used to monitor the establishment of bankside vegetation, using monthly georeferenced photos.
- ❖ Timelapse cameras will be placed within the vicinity to visually monitor changes in water levels within the lagoons, particularly during storm events.
- ❖ The biodiversity at the intervention will be monitored by:
 - ❖ Placing floating invertebrate traps on the surface water of each lagoon to monitor emerging insects on a yearly basis.
 - ❖ Carrying out pond dipping to monitor the presence of aquatic fauna in each lagoon on a yearly basis.
 - ❖ Undertaking a qualitative assessment of flora and fauna during each visit.

Acknowledgements

Thank you to T.R. Cook of Home Farm, Sennowe Park for his assistance during construction and the generous provision of land. A further thank you to the UWCFG for working with us, and to William Morfoot Limited, who assisted with the design and carried out the groundworks.

The Water Sensitive Farming Initiative is proudly supported and funded via a partnership between WWF and Coca-Cola, and delivered by Norfolk Rivers Trusts. Water quality and returning water to nature is incredibly important to Coca-Cola as part of their water stewardship commitment.

The specific Home Farm work was additionally supported through a generous £10,000 donation from Coca-Cola European Partners (CCEP). To celebrate the first anniversary of their “This Is Forward” sustainability strategy, CCEP collaborated with Litterati (a litter picking mobile App) and launched an internal challenge for employees, encouraging them to pick litter and use the App. Almost 10,000 pieces of litter were collected and CCEP decided to turn the amount of collected litter into a £10,000 charity donation. It was agreed this would fund specific on-the-ground works delivered by the Water Sensitive Farming Initiative.