

# Case study 52. Fingringhoe Managed Realignment

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**Main driver: Defence savings and intertidal habitat creation to provide compensatory habitat**

**Project stage: Breach completed in September 2015; site finished in May 2016**



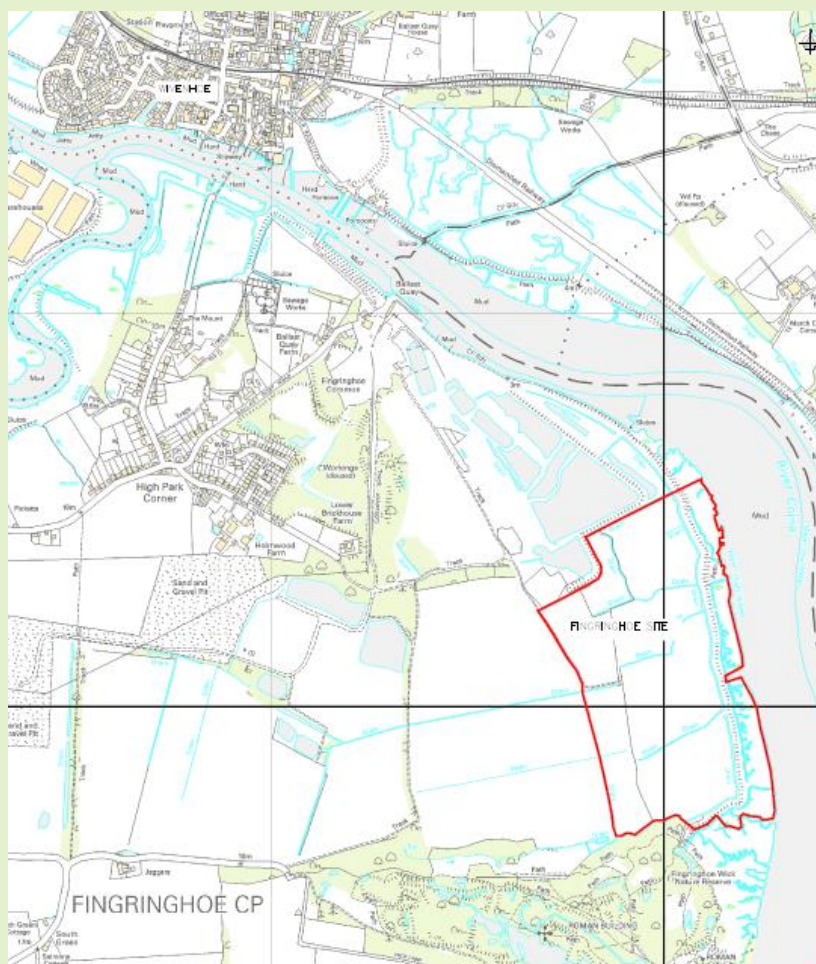
**Photo 1: Breach construction underway September 2015**

## **Project summary:**

The Fingringhoe Intertidal Habitat Creation Project has created 22ha of new, internationally important intertidal habitat on the Colne estuary in Essex (Map 1). The project was managed through a central partnership between the Environment Agency and Essex Wildlife Trust, with additional partners coming on board at different times. These included Natural England, neighbouring landowners and around a hundred volunteers.

## **Key facts:**

This project was conceived in 2011 and implemented in 2015 when a 300m breach in the seawall was constructed at Fingringhoe. This landscape-scale conservation project not only enhances biodiversity improvements onsite, but also supports internationally and nationally designated sites. Working in partnership has meant it was possible to create some of the most cost-effective intertidal habitat in the country.



**Map 1: West side of the Colne estuary, Essex, south of Colchester (source: Ordnance Survey)**

## 1. Contact details

Contact details	
<b>Names:</b>	Merle Leeds
<b>Lead organisations:</b>	Environment Agency Essex Wildlife Trust
<b>Partners:</b>	Natural England, Place Services, private landowners and volunteers
<b>e-mail address:</b>	Merle.leeds@environment-agency.gov.uk

## 2. Location and coastal/estuarine water body description

Coastal/estuarine water body summary	
<b>National Grid Reference:</b>	TM 03455 19785
<b>Town, County, Country:</b>	Fingringhoe, Essex, UK

<b>Regional Flood and Coastal Committee (RFCC) region:</b>	Anglian
<b>Transitional and coastal water body size (km<sup>2</sup>):</b>	Colne estuary (1km)
<b>Water Framework Directive water body reference:</b>	Blackwater and Colne
<b>Land use, geology, substrate, tidal range:</b>	Previous farming, now nature conservation and recreation London clay Tidal range: about 700mm a year

### 3. Background summary of the coastal/estuarine water body

#### Socioeconomic/historic context

The seawalls along the Colne estuary were initially constructed in the Medieval period. They were of a low construction and allowed seasonal flooding and grazing to take place on the saltmarshes. After the East Coast floods in 1953, the seawall was significantly raised. Armour lock blocks were used in subsequent years to protect the front face of the seawall from wave attack as the saltmarsh eroded away.

Saltmarsh in Essex has been undergoing erosion due to 'coastal squeeze', where rising sea levels cause the saltmarsh plants to be drowned between the rising tides and the fixed sea defence. Such losses threaten coastal defence, water quality, fisheries and treasured landscapes, as well as valuable ecosystems and wildlife, including important wildfowl populations. Across Essex, over 300ha of saltmarsh have been lost since 1988 and in the Colne estuary there has been a net loss of 49.5ha (Cooper et al. 2001, Thomson et al. 2011).

#### Flood and coastal erosion risk management problem(s)

The site at Fingringhoe was identified as having potential for managed realignment due to its poor agricultural value and existing vulnerability to flooding. The Essex and South Suffolk Shoreline Management Plan (October 2010) highlighted the deteriorating condition of the seawall and the sea defence was overtopped by the tide in the tidal surge along the East Coast in December 2013. Careful evaluation indicated that the shape of the site, linear to the estuary, was ideal for managed realignment. The site's topography was also suitable with the land rising naturally at the back, thereby removing the requirement for a new sea defence.

### 4. Defining the problem(s) and developing the solution

#### What evidence is there to define the flood and coastal erosion risk management problem(s) and solution(s)

Back in 2015 the land was in private farming ownership. The adjacent landowners, Essex Wildlife Trust, approached the Environment Agency to enquire whether it could work with its experts to investigate the feasibility of a managed realignment at the site. The site was obviously vulnerable to flooding and Essex Wildlife Trust was keen to purchase the site should the impacts of removing part of the seawall be acceptable within the Colne estuary complex. A core partnership was established between Essex Wildlife Trust and the Environment Agency, and other partners came on board throughout the duration of the project.

Initial hydromorphic modelling was completed for a breach. The final design of the managed realignment was chosen following a full Environmental Impact Assessment and discussions between Essex Wildlife Trust, Natural England and the Environment Agency. The final design minimised

engineering works on the site – the tide rolls back to naturally rising ground. The breach itself is the large in comparison to the size of the floodplain behind. This was so that the tidal range in the site mimicked the wider estuary. The details were outlined in the planning application required for the site. The planning application received letters of support and was granted within 4 months of the application being submitted.

When undertaking the modelling, the benefits on reducing the flood risk elsewhere in the estuary as a result of completing the realignment were evaluated. There are benefits during low magnitude tidal events where the flood storage capacity provided by the site reduces the tidal level upstream from the site. However, this benefit is relatively small and due to the proximity of the Colne barrier (just over 1km upstream), the barrier provides flood protection to Colchester which does not rely on increased flood storage downstream. During a large tidal event, modelling indicated that the site would have been inundated anyway, so there is no measurable benefit on reducing flood levels for tidal events in excess of a 1 in 20.

### **What was the design rationale?**

At the outset, the aspiration was to undertake and implement a project that exceeded best practice methods. The aim was for the whole scheme to enhance biodiversity and to give visitors a memorable experience. Early on, a meeting was held with local landowners, the local authority, the parish council, Natural England and the Harbour Authority to explain the goals for the site.

The whole rationale behind the design was to ensure the tidal fluctuations within the site are in sync with the wider estuary. This would ensure that the habitat being created across the site was as natural as possible.

Additionally by minimising engineering works, there is no need for counter walls at the rear of the site. Instead the tide reaches naturally rising ground. This reduces any future maintenance costs as well as providing a unique habitat that is extremely rare across Essex and anywhere else where seawalls are constructed. One counter wall was constructed at the southern side of the site; this is a grass embankment, with a wide berm at its base to encourage saltmarsh plants to colonise this toe of the new defence.

The delivery of the project was enhanced by the engagement with volunteers, neighbouring landowners and a variety of professionals. No additional legal agreements were created, but a number of more informal partnerships were developed.

One adjacent landowner offered easier access to the site across their land during the construction phase, as well as allowing some of their land to be incorporated into the overall design. This enabled a greater area of habitat to be created. Natural England established the basis for the future agri-environment scheme from the outset and was constantly involved either in the design or the consenting process.

In keeping with the aspiration of trying to exceed best practice, at each step the project team drew on the experience of a range of external organisations. Froglife was commissioned to assess the reptiles onsite and provide suggested improvements to the mitigation strategy. Place Services at Essex County Council joined the partnership to review and oversee all archaeological investigations and results. While carrying out computer modelling of the realignment site, consultants CH2M were asked to use their experience in the design of the breach. Flow speeds were designed to be less than 1m per second. Evidence from other European realignment sites was used directly to improve and inform the design at Fingringhoe.

#### **Project summary**

<b>Area of transitional and coastal water body or length benefiting from project:</b>	22ha
<b>Types of measures/interventions used (both Working with Natural</b>	300m breach in the seawall



<b>Processes and traditional):</b>	
<b>Standard of protection for project as a whole:</b>	Flood protection was intentionally removed from the site and adjacent land is outside the tidal floodplain.
<b>Estimated number of properties protected:</b>	Not applicable

### How effective has the project been?

From a wildlife perspective the site has been an immediate success. Over 15 species of threatened bird species have been recorded using the site. These included 670 black tailed godwit and 120 avocet.

Plant species are being surveyed over the next 5 years, as are accretion levels.

The construction of the habitat has eliminated maintenance costs and responsibility for maintenance of 2km of sea wall. Provision of this compensatory habitat has also allowed continued maintenance of sea defences protecting people and property elsewhere in Essex, as detailed in the Shoreline Management Plan.

## 5. Project construction

### How were individual measures constructed?

The breach and short counter wall and preparatory groundworks were built by a Field Services team from the Environment Agency (Photo 1).

### How long were measures designed to last?

Into perpetuity – the counter wall has a 100 years standard of protection.

### Were there any landowner or legal requirements which needed consideration?

A legal agreement was drawn up under Section 30 of the Anglian Water Authority Act 1977 for the core partnership between Essex Wildlife Trust and the Environment Agency. The deed specifies future land use of the site and details the responsibility of each signatory.

Planning permission and a marine licence were both required. The adjacent Colne estuary is designated as a Site of Special Scientific Interest (SSSI) and a Special Protection Area (SPA).

## 6. Funding

### Funding summary for Working with Natural Processes (WWNP)/Natural Flood Management (NFM) measures

<b>Year project was undertaken/completed:</b>	2015 and 2016
<b>How was the project funded:</b>	Essex Wildlife Trust and grant-in-aid
<b>Total cash cost of project (£):</b>	£436,167
<b>Cost–benefit ratio (and timescale in years over which it has been estimated):</b>	Cost of intertidal habitat creation: £19,825.77 per hectare

## 7. Wider benefits

### What wider benefits has the project achieved?

In its first year of being open to the tide the site is developing well. Land levels are rising, saltmarsh plants are already colonising on the edges of the site and the number of birds recorded is increasing over time. There is cautious optimism that monitoring over the next 5 years will document the establishment of a vibrant saltmarsh community.

The partnership project at Fingringhoe Wick is a superb example of creating internationally scarce intertidal habitat while managing a vulnerable section of coastline in a sustainable and practical manner.

Fingringhoe is one of the most cost-effective managed realignment projects in the UK. The intertidal habitat was created in a relatively short time frame compared with other realignment sites around the country and has proved to be good value for money.

The site has proved to be a popular extension to the adjacent nature reserve, with a wide range and great abundance of different species already recorded. Visitor numbers are up and members of the public who donated towards the land purchase are giving positive feedback. Donors are particularly impressed with the project and the use of their money. Over 4km of new permissive paths have been created across the site.

### How much habitat has been created, improved or restored?

A total of 22ha of new intertidal habitat has been created, 1ha of freshwater reedbed and an additional 8ha of grassland conversion from arable fields.

## 8. Maintenance, monitoring and adaptive management

### Are maintenance activities planned?

Essex Wildlife Trust has taken over management of the site. Annual mowing takes place on the short new counter wall. There is no management of the saltmarsh and mudflats themselves.

### Is the project being monitored?

Essex Wildlife Trust is monitoring the site for bird species. Plant species and rates of accretion are being measured by Essex University.

### Has adaptive management been needed?

A year after the breach was created a new bird hide was installed by Essex Wildlife Trust, though this was in response to understanding how the site was evolving and how visitors could have the best experience and enjoyment from the site.

## 9. Lessons learnt

### What was learnt and how could it be applied elsewhere?

The partnership approach was a great success, with everyone involved giving commitment and energy to ensure this success. Clear and frequent communication cannot be underestimated in generating the partnership spirit that ultimately allowed a much higher quality result to be created than if the organisations concerned had worked individually.

## 10. Bibliography

COOPER, N.J., COOPER, T. AND BURD, F., 2001. 25 years of salt marsh erosion in Essex: Implications for coastal defence and nature conservation. *Journal of Coastal Conservation*, 7 (1), 31-40.

THOMSON, S., REID, C. AND BOYES, S., 2011. *Essex Coastal SSSIs – Assessment of changes in extent of saltmarsh over the period 1997 to 2008*, Volume 1. Report to Natural England: ZBB745-F-2011. Hull: Institute of Estuarine and Coastal Studies, University of Hull.

### Project background

This case study relates to project SC150005 'Working with Natural Flood Management: Evidence Directory'. It was commissioned by Defra and the Environment Agency's [Joint Flood and Coastal Erosion Risk Management Research and Development Programme](#).