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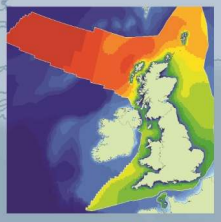
Abbotts Hall Managed Realignment Scheme (England)

Case Study

March 2011

Creating sustainable solutions for the marine environment


Basic Statistics

Location	Coordinates (long; lat)	Area (ha)	First Tidal Inundation Date	Years Embanked	Previous Land Use	Tidal Range
Salcott Creek, Black-water Estuary, Essex	0.84556009184722; 51.78464759917050	85	October 2002	>200	Arable	4.7m (spring)

Plate 1. **The managed realignment at Abbotts Hall (shortly after first inundation; breaches circled in pink) - Google Earth derived aerial view**

Design and Management

The scheme required five breaches in some 3km of hard defences to achieve inundation of the area available (ca. 49ha of the 85ha scheme is intertidal). The largest breach was 100m wide; with a level of +1.5mOD (about MHWN). The four other breaches were smaller being 10-20m in width at higher levels, and all included channels cut through the breach (3-4m in width) to a lower level to facilitate drainage. The main breach was included to moderate outflow; it acted as a sill, restricting the tidal prism of the site and controlling the phasing of the exchange between the site and Salcott Creek (personal communication, HR Wallingford). As the scheme is largely to rising ground, only a 400m section of new embankment needed to be constructed.

Stage 1 of the scheme consisted of a regulated tidal exchange on part of the site (20ha). In the 7 years of its existence, this 'facilitated a significant build up in surface elevation of those areas impacted by tidal inundation through the deposition and accretion of suspended sediments (…). Thus, the realignment scheme was, in effect, given a 'head start', with regard to both ground

conditions and the availability of a suitable plant source to initiate colonisation' (Nottage and Robertson, 2005).

The realignment site is owned and managed by the Essex Wildlife Trust, and forms part of its wider (280ha) Abbotts Hall Farm holdings, where the NGO's head office is also based. The remainder of the land is now being farmed in a ecologically sensitive manner – including the restoration and creation of hedgerows, the addition of field margins and beetlebank strips to arable fields, restoration and creation of ponds, and planting woodland on the edges and corners of fields (Essex Wildlife Trust Website, 2010).

(Taken by: C. Scot, ABPmer, 2004)

Plate 2. Water flowing into the site through the main breach

Promoters and Objectives

The Essex Wildlife Trust purchased the site with the help of funding from the WWF and the Heritage Lottery Fund. The Environment Agency managed the creation of the realignment. English Nature was also involved. The scheme had the following objectives:

- Creation of new coastal habitat (including intertidal mudflat, saltmarsh, transitional grassland and grazing marsh) as well as new freshwater habitat.
- Provision of natural flood defence.

Funding

In 2000 the Essex Wildlife Trust purchased the Abbotts Hall estate with funding from the WWF-UK and the EHLF. The main partners involved in the project also include English Nature and the Environment Agency.

Planning Requirements and Consultation

1. Town and Country Planning Act 1990
2. Environmental Impact Assessment required
3. Habitats Regulations - Appropriate Assessment required
4. Coast Protection Act 1949 (CPA) – licence required
5. Food and Environment Protection Act 1985 (FEPA) – licence required
6. Land Drainage Act 1991 – licence required
7. The Water Resources Act 1991 – licence required
8. The Environment Act 1995 – licence required

For a more detailed description of the consents procedure, please refer to the Essex Wildlife Trust's fact sheet 4 on Abbotts Hall Farm (available at: http://www.essexwt.org.uk/visitor_centres__nature_reserves/abbotts_hall_farm/).

Monitoring

The following aspects were monitored for at least two years (vegetation and birds longer): accretion/erosion on site (altimetry); accretion/erosion off site; scour (in breach B); bathymetry (one off); tidal levels and velocities; suspended solids off site; salinity off site; invertebrates off site (one off); vegetation; birds; fish; amphibians/reptiles

Findings and Lessons

According to the Essex Wildlife Trust (2005), the scheme has been effective in safeguarding the local natural environment of the Salcott Channel and the West Mersea Oyster Fishery downstream of the realignment site. The additional monitoring works undertaken at the request of the local oystermen have demonstrated no noticeable effects on their activities.

The natural slope of the site has benefited small fry which have been observed rising through the vegetation with the tide. The gradual slope allows for the zonation of vegetation and provides a mosaic of habitats for a range of sizes and species of fish. The semi permanent pools, which are inundated on high tides, serve as feeding and refuge areas over a tidal cycle. On one occasion, 2000 herring/sprat were caught using a seine net in one tidal pool. This illustrates the value of the realignment site as being beneficial for both commercial and recreational fisheries in the Blackwater estuary.

(Taken by: C. Scot, ABPmer, May 2010)

Plate 3. South-easterly view across site from bird hide

The tidal regime monitoring (Environment Agency, 2003) determined that no clear evidence of any significant change in upstream tidal levels following implementation was found, which is consistent with the predictions of change (these were of the order of a few millimetres). The general direction and phasing of flood and ebb flows remained unchanged (this was considered unsurprising given the generous configuration of the main drainage channel (Salcott Creek)). There seemed to be a slight increase in current speeds at the station closest to the realignment (as well as a 15% increase at another station). These increases were most marked on the ebb tide as water receded seawards. It was noted that the observed increase in current speeds compared favourably with anticipated increase. The absolute increase in velocity does not appear to have produced any significant erosion of the channel bed. No major hydrodynamic changes were observed in Salcott Creek in the period immediately after the breach (when potential changes would be expected to be most pronounced). By 'restraining tidal outflow' the main breach also promoted sediment deposition and accretion which consequently led to elevation increases and vegetation colonisation. The monitoring allayed local fears with regards to sediment concentrations that the realignment could generate 'sediment plumes' as no significant increase in sediment concentrations immediately after the breach were observed. This is consistent with little erosion being observed. Monitoring of suspended sediment concentrations was able to demonstrate that the realignment site was acting as a net sink for sediment (with sediment deposition described as 'significant') and not as a source and was thus able to dispel concerns associated with accumulations of fine sediment that were reported to occur downstream. The Essex Wildlife Trust (2005) states that 'it turned out that the 'problem' was caused by a new colony of tubeworms and was unrelated to the Abbotts Hall realignment'.

Contacts

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References

Environment Agency, 2003. Sustainable flood defences – monitoring of managed realignment scheme at Abbotts Hall, Essex. Ipswich: Environment Agency, 22p (excl. appendices).

Essex Wildlife Trust, 2005. Abbotts Hall Farm Fact Sheet 9 - Lessons Learned from Realignment. Colchester: Essex Wildlife Trust, 4p. – more fact sheets available at: http://www.essexwt.org.uk/visitor_centres__nature_reserves/abbotts_hall_farm/

Nottage, A., Robertson, P., 2005. The saltmarsh creation handbook: a project manager's guide to the creation of saltmarsh and intertidal mudflat. RSPB, Sandy, 128p.

Website

Essex Wildlife Trust's Reserve Website:
http://www.essexwt.org.uk/visitor_centres__nature_reserves/abbotts_hall_farm/