CASE STUDY

Create compensatory habitat to offset impacts

Project Summary

Title: Trimley and Shotley Intertidal Habitat Creation
Location: Trimley and Shotley, Suffolk, England
Technique: Create new intertidal habitat
Cost of technique: £££££
Overall scheme cost: £££££
Benefits: £££££
Dates: 1998-2010

Mitigation Measure(s)

Create compensatory habitat to offset impacts
Realign flood defences to increase coastal and intertidal habitat

How it was delivered

Delivered by: Harwich Harbour Authority
Partners: Department for Transport; Department for Environment, Food and Rural Affairs, Royal HaskoningDHV.


Habitat enhancement bunds on Shotley foreshore


Intertidal habitats created by the new bunds

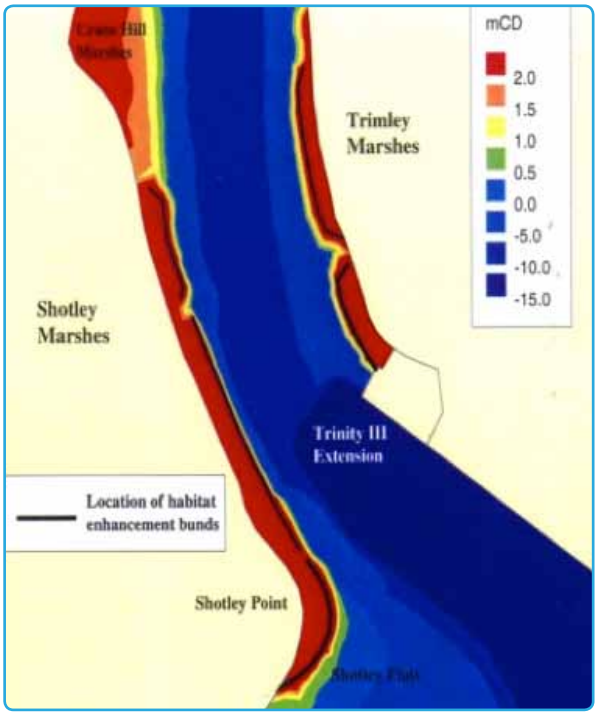

Intertidal habitats created by the new bunds

Background and issues

Planning consent was given to Harwich Haven Authority (HHA) in 2002 for the Trinity III Terminal (Phase 2) Extension. The construction of the extension started in February 2003 and was completed in September 2004. As part of the scheme, HHA was granted a Food and Environment Protection Act 1985 (FEPA) licence to beneficially dispose of dredged material arising from the capital dredging that was undertaken as part of the scheme. This material was used for the construction of intertidal bunds on the foreshore at two sites along the River Orwell at Shotley and Trimley. Dredged material was subsequently placed behind the bunds to create new intertidal habitats.

The objectives of the habitat enhancement schemes are as follows:

1. To provide an enhanced level of protection to the seawalls along the Trimley and Shotley frontages by raising the level of the intertidal area.



Location of habitat enhancement bunds along the Orwell Estuary

2. To enhance the ecological value of 23 ha of intertidal habitat (of which approximately 20 ha will be intertidal mud and 3 ha saltmarsh), replacing the feeding habitat lost due to the immediate effect of the quay extension and dredging, over the short to medium term.

3. To raise the level of the intertidal mud, thereby increasing its exposure and providing a feeding habitat for waterfowl for a longer period in the tidal cycle (i.e. increasing the number of bird feeding hours), mitigating the effect of a reduced tidal range.

Step-by-step

Construction of the habitat enhancement schemes was completed in October 2003. The schemes involved the placement of clay and gravel bunds on the Shotley and Trimley foreshores which were then landscaped to create a variety of land heights and. The area behind the bunds was then backfilled with silt and sandy gravel and left to recover naturally. The scheme utilised approximately 107,000 dry tonnes of dredged material that would otherwise have been placed offshore at the Inner Gabbard disposal site.

On completion of the bunds and backfilling, the total area covered by the enhancements was approximately 18.3 ha. Of this area, it is estimated that approximately 3 ha was comprised of the bunds themselves, with the remainder being raised mudflat.

Dredged material being placed on the foreshore

Trimley

The Trimley enhancement scheme is situated on the east bank of the Orwell Estuary, approximately two nautical miles upstream from Felixstowe. The enhancement site was created on an existing mudflat which had eroded down to the underlying clay.

The scheme utilised both clay and gravel for the bund which was obtained from capital dredging undertaking as part of the Trinity III Extension. Following the removal of silt from the approach channel during the capital dredge, gravel was dredged from the new approaches and placed in the quay construction zone and onto the Trimley foreshore. Approximately 22,000 m^3 of gravel was placed on the Trimley foreshore to create the bund. The scheme at Trimley essentially comprises one bund, 1.4 km in length, which runs parallel to the seawall approximately 50 – 60 m seaward. The bund was initially deposited to serve as a buffer for wave action, thereby offering some protection to the base of the historic seawall which was showing signs of deterioration. The mudflat created behind the bund acts as a feeding area for wading birds replacing the area lost during the development of Felixstowe port.

Shotley

The Shotley enhancement scheme is situated on the west bank of the Orwell Estuary directly opposite the Trimley site. Sediment placement was first carried out here as part of a trial recharge in December 1997. At this location, a 2 km earth wall, protecting low lying grazing land, had undergone severe erosion following the near complete loss of fronting saltmarsh. The trial recharge involved the use of approximately 22,000 m^3 of maintenance dredgings from the estuary, mostly silt, which was pumped behind a retaining bund of coarse poorly sorted gravel.

In September 2003, in line with the CMMA, further enhancement at Shotley was completed. This involved the construction of clay bunds around Shotley Marina, backfilled with silt (the 'south bunds'). Further north, two areas of existing gravel were 'topped up' with silts (the 'middle bunds') and another scheme was constructed based on bunds created using in-situ material backfilled with silts (the 'northern bunds').

CASE STUDY

Benefits

Trimley

- Since the recharge, the number of species, individuals and diversity of benthic invertebrate at the Trimley recharge site has typically increased. The species richness, abundance and diversity at the recharge sites are now similar to intertidal habitat reference sites having been allowed to recover naturally.
- Since construction the area has be colonised by new marine invertebrates.
- In 2011/12 the peak number of birds at Trimley was the highest since the construction of the bund in 2003 and since the start of the surveys in 2000/01. In 2011/12 there were increases in a number of the key species, including dunlin, redshank, lapwing, shelduck and wigeon which were all recorded to have the highest peak numbers of the entire monitoring period.

Shotley

- Colonisation and community development of benthic invertebrates has increased at the recharge sites since construction, although has yet to reach the levels found at the intertidal habitat reference site.
- New saltmarsh has been created behind the bund, with species including common glasswort flourishing in some areas.
- The site continues to support a large number of birds and the benthic invertebrates in the mudflats appear to be providing sufficient feeding material to support over-wintering populations, including dunlin, lapwing and ringed plover.

(1) Clay bunds backfilled with silt around Shotley Marina;
(2) Common glasswort growing on Shotley;
(3) Wildfowl using the area as a feeding resource.

Lessons Learnt

- Recognition of the importance of monitoring in mitigation.
- For schemes with significant implications, the establishment of a participatory forum is vital.
- Ensuring delivery and establishing trust are key to large-scale beneficial use projects.
- Enabling shared decision-making.
- Delivery through existing management forums.

Project contact: Coastal and Marine Environment team, Royal HaskoningDHV.