

**ENVIRONMENTAL OPPORTUNITIES IN LOW LYING
COASTAL AREAS UNDER A SCENARIO
OF CLIMATE CHANGE**

**FINAL REPORT
APPENDIX B**

**Prepared for:- National Rivers Authority
Department of Environment
Nature Conservancy Council
Countryside Commission**

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APPENDIX B1.1

**POTENTIAL CASE STUDY SITES FOR FURTHER
INVESTIGATION OF THE MANAGED RETREAT OPTION**

Table BI.1 Potential Case Study Sites for further Managed Retreat Investigation, by NRA Region

Region: Anglian

AREA	NOTES
Foulton Hall Point/Dovercourt/adjacent areas	Managed retreat to high ground in an area currently used for agricultural production could be used to extend the area of saltmarsh. Land elevation and the possible need to maintain the sea wall in some form as a breakwater are likely to be critical issues.
Ray Pits Farm/adjacent areas	Generally a sheltered estuary site although some crosswalls may be needed to reduce exposure. Retreat may be possible along the stretch from Canewdon to South Fambridge but the implications of retreat for seawalls using refuse as infill should be fully considered.
Queens and/or Kings Marshes, Lower Deben	Existing agricultural habitat of no nature conservation interest, but area might present an opportunity to develop high level saltmarsh and associated habitats.
Benacre, NNR	Natural shingle wall protecting a brackish lagoon. Shingle ridge is breaching with increasing frequency and the implications of a retreat policy might therefore be investigated.
Norfolk Broads	Several self-contained flood compartments on the rivers Yare, Waveney, Bure, Ant and Thurne were identified as potential candidates for retreat by a recent University of East Anglia Study (Brooke and Turner, 1989). Marsh and/or reedbed habitat might be created and reversion to grazing marsh might be encouraged in other areas if flood defence standards are lowered.
Cley Bank	RSPB reserve currently protected by a managed shingle ridge. The implications of failure might be investigated.
Holkham Bay	Area of grazing marsh and arable land currently protected by a semi-natural sand dune. Retreat may allow saltmarsh or grazing marsh to develop.

AREA	NOTES
Winterton	A sand dune has grown up on top of seawall. Latter has recently been re-exposed, and the implications of a managed retreat could be investigated.
Winteringham Ings	Retreat could offer opportunities to develop borrow pits into intertidal lagoons and feeding areas.

Region: North West

AREA	NOTES
Ribble Estuary, SSSI Banks Marsh (south side) Freckleton Pool (north side)	Two embankments exist where a private landowner built an embankment seaward of the existing NRA defence. Loss of these embankments would give nature conservation benefits, but the land is of high agricultural value.
Pilling/Cockerham	Retreat would present an opportunity for the land to revert back to saltmarsh. The area used to be a tidal saltmarsh until it was enclosed by the Pilling-Cockerham sea defence embankment in 1981.

Region: Severn Trent

AREA	NOTES
Upper Humber/Lower Trent - Alkborough Flats - Whitton	Wetland bird habitat could be created to add to existing areas of mudflat, reedbed and associated habitats in the Upper Humber Estuary. Warping may be required to raise land levels and encourage transition from arable land through grazing to saltmarsh.
Morton Bend	Wetland habitat creation opportunities may exist within meander if bend is removed to ease navigation.
Broomfleet	Area owned by Associated British Ports could provide opportunity for setting back defence line and creating habitat on existing agricultural land.
Beckingham Marshes	Possible habitat creation (e.g. fresh/brackish marsh) on land owned by NRA. Defences must, however, be retained in some form to maintain flood storage function.
Frampton breakwater to Hock Ditch	Retreat project underway adjacent to Wildfowl and Wetlands Trust Reserve at Slimbridge. Negotiated arrangement involving NRA, landowner, WWT and NCC. Elsewhere in this area, however, defences are being maintained to protect geese feeding grounds.

Region: Southern

AREA	NOTES
Dungeness	Southern side of Dungeness promontory may be a candidate for retreat; a secondary tidal defence already exists over part of the length.
Isle of Grain	Island in the tidal area of the Thames estuary. The area floods every one in ten years and reversion from arable to grazing marsh could be encouraged.
East side of Newhaven, Seaford and Denton, Ouse Estuary	Area has an obvious cliff to retreat to near the tidemill. Area of shingle where retreat would have implications for geological interest. Saline intrusion could, however, affect the recharge to an aquifer used by the Mid-Sussex Water Co.
Bracklesham Bay	Could create an intertidal area whereby Selsey Bill would become an island again. A long cross wall would, however, need to be built.
Beaulieu Estate, Beaulieu Estuary (west side)	Past flooding on Gins Marsh estate has shown this to be a potential site for managed retreat. The wall is privately owned by the Beaulieu Estate, however, and is therefore not the NRA's responsibility.
Hayling Island	Opportunities for retreat and habitat restoration may exist in and around the Hayling Island area.
Thorneybrook	East side of Western Yar Estuary where the agricultural land regularly gets flooded by salt water anyway, may offer opportunities for habitat creation.

Region: South West

AREA	NOTES
River Camel	Much of this area is already of interest for birds. Also important saltmarsh habitat. NCC would be willing to allow bank failure and envisage significant nature conservation interest being developed. The area is in agricultural use with few properties, but is protected by private defences.
Exe Estuary	Large estuary embanked at the top at Exminster Marshes. Land on both sides of the estuary is owned by British Rail. The land between the railway and the embankments, now largely in agricultural use, but retains significant interest for wading birds.
River Clyst	Tributary of the River Exe. The NRA have responsibility for the banks which frequently overtop onto the agricultural land. The head of the estuary is tidal with some freshwater flooding. Retreat would provide significant opportunities for wetland/marsh habitat creation.
River Fal	At the top end of the estuary saltmarsh (with a full transition through to woodland) has developed over outwash from china clay pits. There may be scope for further habitat creation in the estuary, possibly using china clay waste as a substrate.
Isles of Scilly	Low lying coastal dune and boulder beach habitats of high nature conservation interest. Already suffering from storm damage and saltwater incursion. There is, however, a need to protect valuable farmland and water supply aquifers.

N.B. Other possible case studies for further investigation of the benefits and disadvantages of the retreat option in the South West region might include sites on the Axe and Tamar Estuaries, at Marazion marsh (where some nature conservation agencies might wish to see the defences maintained to protect the existing freshwater habitat), and at Braunton Marshes behind an extensive dune system.

Region: Wessex

AREA	NOTES
Bridgwater Bay and Parrett Estuary	Opportunities may exist along this narrow estuary for retreating from the present line of defence to create wetland areas (e.g. at Pawlett Hams). The creation of high tide roosts might also be investigated as existing sites are likely to be affected by sea level rise.
Porlock Bay	Shingle ridge thinning and breaching with increasing regularity. Retreat options might include creation of brackish marsh, with reedbeds where there is strong freshwater influence. Control structures may be required to maintain water levels and prevent drying out at low tide.
Portishead and Gordano Valley	Existing National Nature Reserve may be under threat from development. Implications of retreat should be investigated alongside protection options.
Blue Anchor to Lilstock	Retreat may be a possibility in this area currently protected by a gabion wall built in the 1960s.

N.B. At other sites NRA (Wessex Region) are actively investigating options for setting embankments back up to 40m for engineering purposes (stability). Habitat creation and restoration could be/is being explored on these areas.

Region: Welsh

AREA	NOTES
Gwent Levels	Scope for retreat where the predominantly grazed agricultural land is backed by a railway line.
Newport - east side near Llanwern	The area east of the railway in the vicinity of the "new" Severn crossing offers retreat possibilities. Currently protected by sea defences, the agricultural land is under some development pressure but would present excellent habitat restoration/creation opportunities.
Pentwyn Pools	The NRA favour retreat in this area.

Region: Yorkshire and Northumbria

AREA	NOTES
Holy Island	Retreat and/or a reduced defence standard could lead to further beneficial habitat changes.
Kilnsea	Retreat to the old secondary defence line (Easington Bank) could give scope for development of grass marsh, reedbeds and saltings. Water level control would, however, be required.
Hauxley	Enhancement of former opencast sites at the rear of the dune system could produce significant nature conservation benefits.
Tees Estuary	Habitat creation may be possible on a site within the industrial part of the estuary which is zoned for development but not yet developed. A secondary line of defence does exist but the standard is unknown.
Sunk Island	Currently owned by the Crown Estate Commissioners, Sunk Island could provide valuable opportunities for mudflat/saltmarsh creation and restoration.
Druridge Bay/Hauxley	Bay area which would present a suitable area for retreat. However, the need to maintain the integrity of opencast operations in the hinterland would be a key consideration.
Northumbrian Dunes	In some areas, particularly where tidal flooding already takes place, habitats could be encouraged that are of greater conservation value than the existing rough grazing. Sluice gates could be installed at tidal water inlets to increase the extent and duration of inundation.