

HAPPISBURGH TO WINTERTON SEA DEFENCES



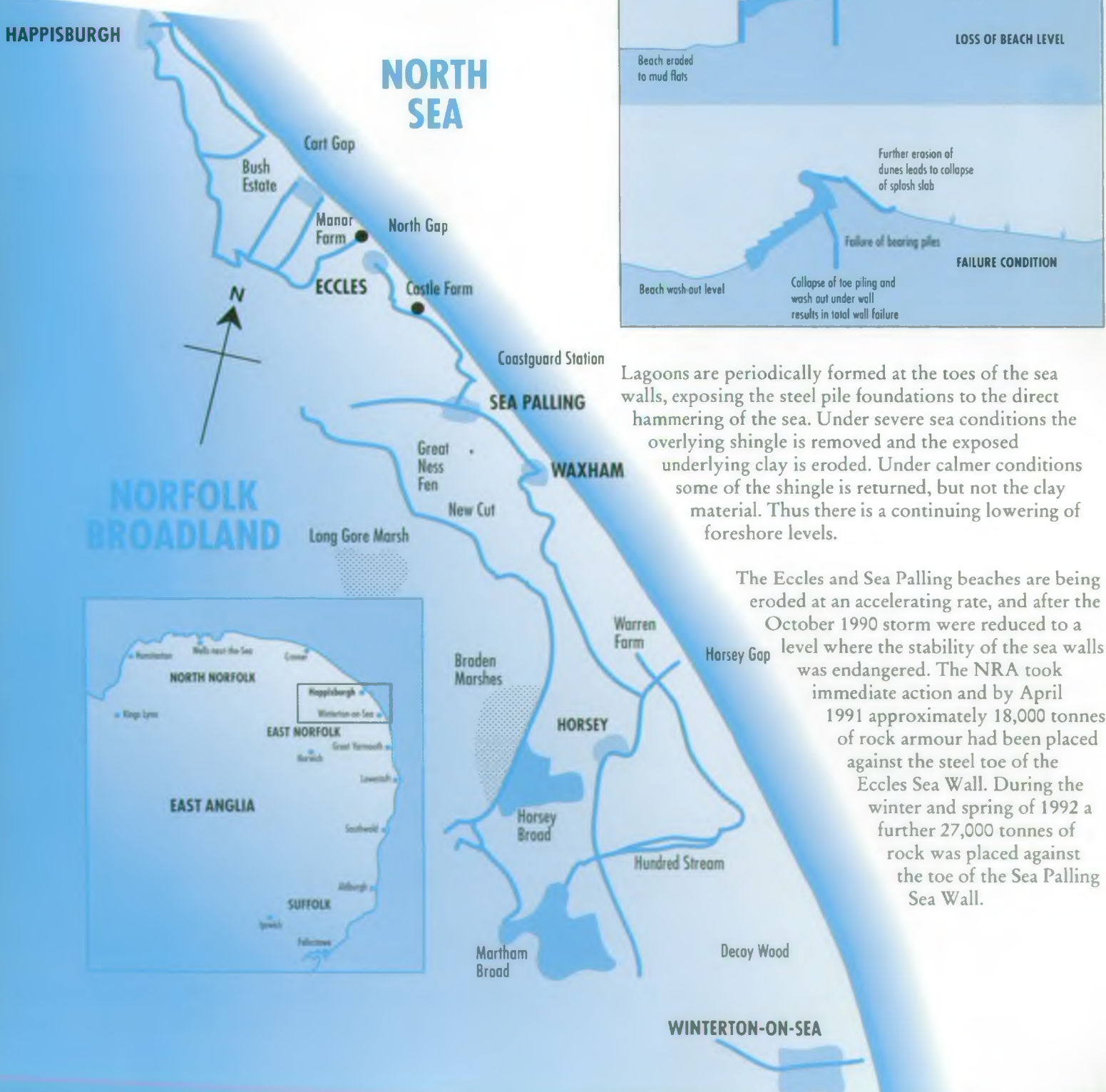
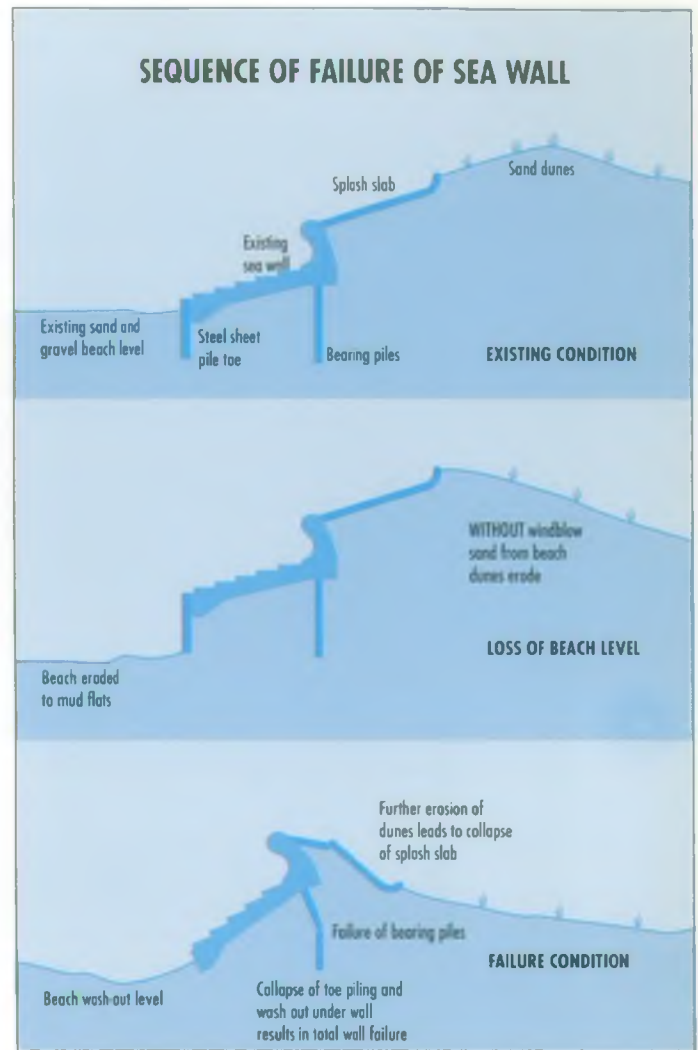
NRA

*National Rivers Authority
Anglian Region*

Over the centuries the north facing coast of East Anglia has been the scene of many battles with the sea.

The area of low lying coastal plain with its scattered villages and farmsteads is now protected by seawalls backed up by sand dunes. Although the walls provide adequate defences against the ultimate storm, the profiles of the walls and the present beach defences do not encourage the retention of the immediate foreshore.

The foreshore consists of a sand and shingle "vener" overlying firm organic clay and investigations have shown that there is a north to south drift of beach material from Cromer to Winterton from where it disperses into the North Sea shingle banks. Every year an estimated 75,000 cubic metres are lost and as there is no substantial inflow of material the overall effect is a gradual lowering of beach levels.



Lagoons are periodically formed at the toes of the sea walls, exposing the steel pile foundations to the direct hammering of the sea. Under severe sea conditions the overlying shingle is removed and the exposed underlying clay is eroded. Under calmer conditions some of the shingle is returned, but not the clay material. Thus there is a continuing lowering of foreshore levels.

The Eccles and Sea Palling beaches are being eroded at an accelerating rate, and after the October 1990 storm were reduced to a level where the stability of the sea walls was endangered. The NRA took immediate action and by April 1991 approximately 18,000 tonnes of rock armour had been placed against the steel toe of the Eccles Sea Wall. During the winter and spring of 1992 a further 27,000 tonnes of rock was placed against the toe of the Sea Palling Sea Wall.

However, these were only stop gap measures, albeit costing in excess of £1.5m, which do little to reduce beach depletion and have limited effective life.

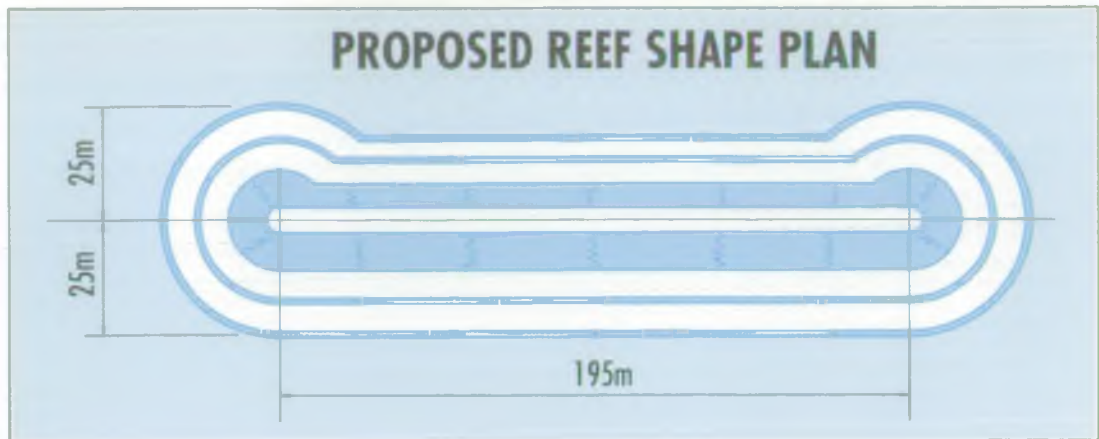
The existing steel and timber groynes have proved incapable of preventing this loss of material, which if allowed to continue, will result in the present sand and shingle beach being reduced to mud flats. Lagoons are appearing on the foreshore and as these grow more and more of the lower sections of the sea walls will be exposed to the hammering attack of the sea. This will have serious consequences for the effective structural life of the walls.

If the sea wall does fail, 6,000 hectares of low lying hinterland will be regularly inundated by the sea and reduced to salt marshes. Residential, agricultural and commercial properties will become untenable. This will destroy the existing natural environment and adversely affect the recreation and tourist attraction of the beaches.

The sand dunes are a Site of Special Scientific Interest and home to many species of sea birds. They are wholly dependent on being replenished by sand, wind-blown from the foreshore. If the beach is allowed to erode to mud flats then the sand dunes will be literally blown away by the wind.

In order that the coastline and the hinterland can be retained in its present form, it is essential that the structural stability of the existing sea wall is safeguarded. This can only be done by taking steps to retain the sand and shingle foreshore.

The NRA has produced a long term strategy for sea defences between Happisburgh and Winterton. It is based on long term beach management to ensure foreshore levels are always sufficient to protect as much as possible the



steel and concrete sea walls which are the final barrier against the sea.

To assist in retaining desirable foreshore levels, it is proposed, over the next 20 years, to build 16 "shore parallel" offshore reefs to reduce beach volatility and to periodically replenish the beach to acceptable profiles with material obtained from offshore sources.

Environmental Considerations

Because of public interest in wildlife and the coastal environment in the area the NRA commissioned environmental consultants to liaise with local interests, study the proposals and assess their environmental impact.

An environmental statement has been produced which assesses the effects of the proposed reef system.

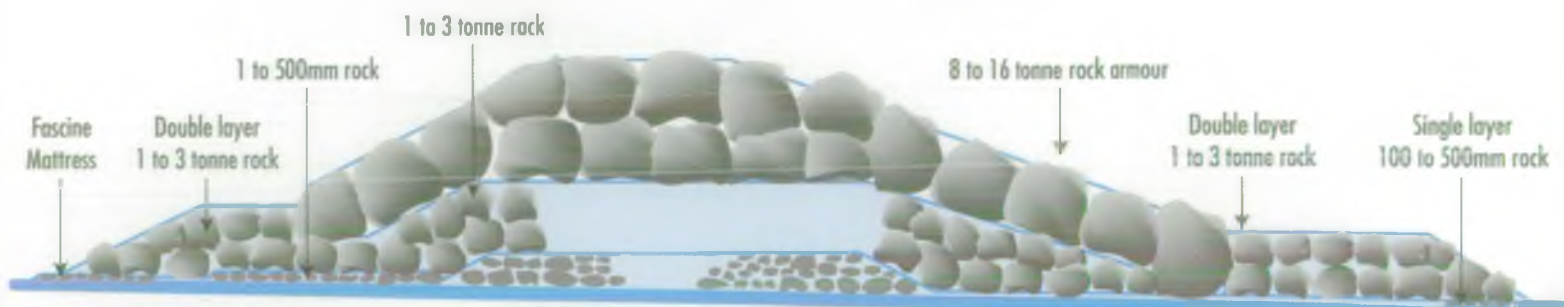
The statement highlights the environmental losses that will occur if the coast is not managed. In particular:-

- the Broads area behind the defences will eventually become inundated and destroyed by salt water.
- the dunes will be starved of fresh sand from the beach and will gradually erode away.
- the beach will be lost. As the top layers of sand and shingle are stripped off all that will remain will be an unpleasant clay mudflat.

OFFSHORE REEF CROSS SECTION

Shore side

Sea side



Works are being grant aided by the Ministry of Agriculture, Fisheries and Food

The National Rivers Authority

Guardians of the Water Environment

The National Rivers Authority is responsible for a wide range of regulatory and statutory duties connected with the water environment.

Created in 1989 under the Water Act it comprises a national policy body coordinating the activities of 8 regional groups each one mirroring an area(s) served by a former regional water authority.

The main functions of the NRA are:

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| Water resources | — The planning of resources to meet the water needs of the country; licensing companies, organisations and individuals to abstract water; and monitoring the licences. |
| Environmental quality and Pollution Control | — maintaining and improving water quality in rivers, estuaries and coastal seas; granting consents for discharges to the water environment; monitoring water quality; pollution control. |
| Flood defence | — the general supervision of flood defences; the carrying out of works on main rivers; sea defences. |
| Fisheries | — the maintenance, improvement and development of fisheries in inland waters including licensing, re-stocking and enforcement functions. |
| Conservation | — furthering the conservation of the water environment and protecting its amenity. |
| Navigation and Recreation | — navigation responsibilities in three regions — Anglian, Southern and Thames and the provision and maintenance of recreational facilities on rivers and waters under its control. |



ENVIRONMENT AGENCY

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