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Identifying biodiversity opportunities to inform SMP Review: Sheringham to Lowestoft; North Kent Coast; East Kent Coast; Folkestone to Selsey Bill; and Solent and Poole Bay Natural Areas

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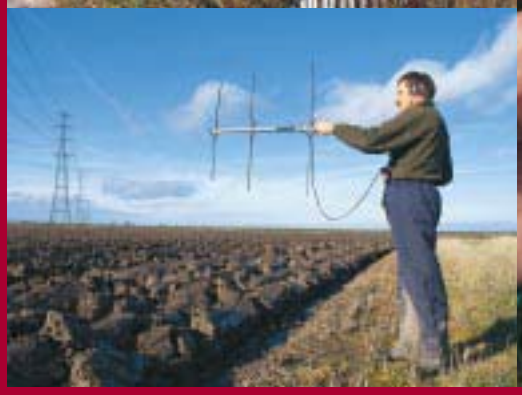

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Identifying Biodiversity Opportunities to inform SMP Review: Sheringham to Lowestoft[#]; North Kent Coast[*]; East Kent Coast[*]; Folkestone to Selsey Bill[#]; and Solent and Poole Bay[#] Natural Areas

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Foreword

The revised guidance for Shoreline Management Plans published in 2001 by the Department for Environment, Food and Rural Affairs (Defra) clearly sets out to ensure that the next generation of Shoreline Management Plans (SMPs) include an assessment of the impacts of shoreline management policies on biodiversity. In addition, Defra High Level Target 9 for Flood and Coastal Defence on biodiversity requires all operating authorities (coastal local authorities and the Environment Agency) to:

- avoid damage to environmental interest;
- ensure no net loss to habitats covered by Biodiversity Action Plans; and
- seek opportunities for environmental enhancement.

This study was commissioned by English Nature to identify environmental enhancement opportunities in advance of the production of second generation SMPs. This work has therefore helped to raise awareness amongst operating authorities of biodiversity opportunities linked to the implementation of SMP policies. It is also the intention that taking such an approach will integrate shoreline management with the long term evolution of the coast and help delivery the targets set out in the UK Biodiversity Action Plan (Annex 1).

Facilitated workshops were used to gather information about biodiversity opportunities. The workshops were attended by staff from English Nature Area Teams in Norfolk, Dorset, Hampshire & Isle of Wight, Sussex & Surrey and Kent and by key stakeholder groups involved with conservation in the coastal environment (Annex 2 provides a list of the organisations that participated in the workshops). This report collates the outcomes of the workshops and provides a breakdown of the biodiversity opportunities in the Natural Areas by using the published SMP policy units. Each chapter of the report provides a brief description of the ecology, geology, geomorphology, land use and infrastructure across the full extent of the Natural Areas. The project achieved the following:

- a breakdown of current SMP policies with suggestions to amend the policy to realise an environmental enhancement opportunity; and
- outlines the potential BAP gains and the associated factors that require further consideration during the process of SMP review.

The process and outcomes will help with future SMP reviews and the identification of biodiversity opportunities will help implement English Nature's Maritime Strategy. This work also compliments the integration of the Coastal Habitat Management Plans (CHaMPs) into SMPs. A breakdown of Biodiversity Action Plan targets, by Natural Area is available from the English Nature web site (www.english-nature.org.uk/baps/intro.htm) and the published Biodiversity Action Plans for habitats and species are obtainable from the UK BAP web page (www.ukbap.org.uk/).

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English Nature, April 2004

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The editor wishes to thank Dr Pat Doody for advice on the format of the project through the production of the pilot report for north and east Kent. Thanks are extended to Dr Richard Cottle (Royal Haskoning) the workshop facilitator for Norfolk and Sussex and Dr Malcolm Bray (University of Portsmouth) for facilitating the Solent and Poole Bay workshop. The editor also thanks English Nature colleagues for providing comment on this research report.

Summary

The project identified potential opportunities for the restoration and improvement of coastal habitats within the Sheringham to Lowestoft, North and East Kent, Folkestone to Selsey Bill and Solent & Poole Bay Natural Areas. The Natural Areas framework developed by English Nature was used to provide the breakdown of the published targets of the Biodiversity Action Plans. The landward limit of the study was the extent of coastal plain or cliff-top habitats subject to maritime influence, but included terrestrial and freshwater habitats in adjacent Natural Areas that may be influenced by long-term coastal change.

In addition to the non-statutory Biodiversity Action Plans, the next generation of SMPs, strategy studies and coastal defence schemes will need to be compliant with national and international conservation legislation, respectively the Countryside and Rights of Way Act 2000 and the Conservation (Natural Habitats &c.) Regulations 1994. The preparation of CHaMPs for some complexes of international sites such as Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) identified ways of meeting our responsibilities, and will be incorporated into SMPs.

Similarly, the standard of the defence line and the adjacent land use needs to be examined to determine whether there would be conservation and/or flood defence benefits of allowing coastal processes to restore a more dynamic environment. An example of such an approach might include the restoration of reclaimed saltmarshes. The capacity of an SMP to recommend the landward realignment of the defence line as the most suitable long-term shoreline management policy presents real opportunities for biodiversity gain. This is also the time to challenge previous assumptions about the perceived benefit in maintaining certain defences as an environmental benefit for adjacent areas. The protection of flood-risk areas that might also be of national or international conservation interest must be assessed if maintaining the defence line causes intertidal habitats to be subject to coastal squeeze against maintained flood defence structures. CHaMPs have addressed this issue for some *Natura* 2000 complexes (see http://www.english-nature.org.uk/livingwiththesea/). Other coastal management practices with regard to cliff and slope protection also require review particularly if they compromise the interests of geological SSSIs. Further information about the condition assessment exercise for SSSIs can be obtained from: http://www.english-nature.org.uk/special/sssi/

It is important to add that the study identified opportunities over a range of spatial and temporal scales. While it may be possible to identify short-term enhancement opportunities, the study also identified plans that will need to begin now to deliver the long term environmental and flood risk management benefits.

Contents

Introduction

The aims of the project

The pilot study for this initiative was written by National Coastal Consultants in March 2002 for the north Kent coast and east Kent coast Natural Areas. The format of the study was a desktop exercise utilising existing information and discussion direct with English Nature. However, a recommendation was that a primary means of information gathering for enhancement opportunities should be through facilitated workshops involving other key environmental stakeholders. For the subsequent studies Royal Haskoning was commissioned by English Nature to facilitate the workshops for Solent and Poole Bay, Folkstone to Selsey Bill and Sheringham to Lowestoft Natural Areas. This research report provides a summary of the potential opportunities identified at each of the workshops and in the initial pilot study and relates them to the coastal defence options available to the SMP (eg a policy of managed realignment).

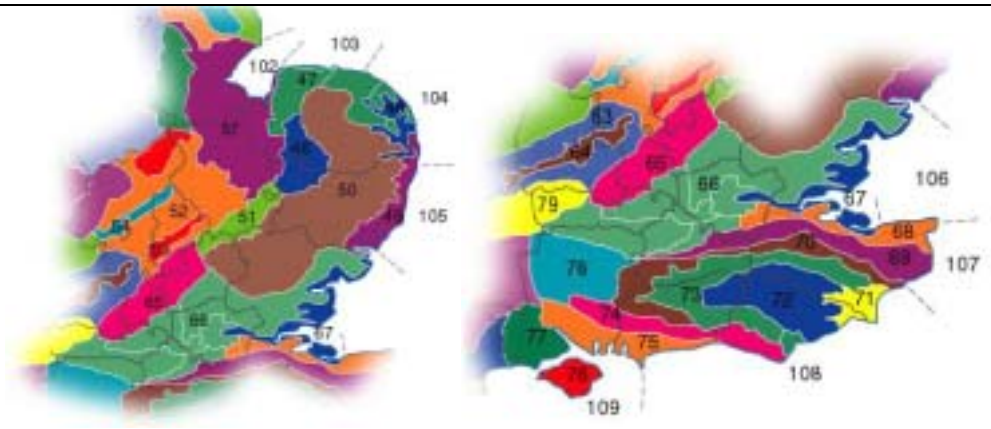
The potential environmental enhancement opportunities identified in this report will therefore enable English Nature and other coastal groups to make a positive contribution to the production of second generation SMPs. It will also enable progress towards the delivery of the UK Biodiversity Action Plan targets. However, biodiversity opportunities that are not exclusively related to coastal defence objectives are included, for example, restoration of cliff top semi-natural vegetation. It should be noted therefore, that the means of realising such opportunities may not be possible within the next generation of SMPs, or that other mechanisms for realising such biodiversity gain may need to be enacted.

Methodology

The aim of the workshops was to identify and discuss ideas for environmental enhancement opportunities ranging from large-scale realignment schemes to small scale habitat management projects that could implement both national and local Biodiversity Action Plan targets in the short and long term. It is important to note that the proposals that have been put forward by attendees, and that are discussed in this report, have not been subject to detailed investigation. Each proposal has been briefly considered within the context of the current SMP policy and suggestions for revising the policies have been included, where appropriate. It is acknowledged however that biodiversity gain is just one part of the SMP process and that other social, economic and sustainability factors will need to consideration in the selection of the preferred coastal defence policy promoted by the operating authority.

It is worth noting that although this report is structured by coastal Natural Area, the actual realisation of the enhancement opportunity could occur with the adjacent terrestrial Natural Area (Figure A).

It is important to stress that it is the purpose of this research report to provide alternative coastal defence policies that promote environmental enhancement opportunities to that currently recommended by the SMP. This provides an important means to promote opportunities through the SMP process and to indicate how progress could be made towards meeting DEFRA High Level Target for Flood and Coastal Defence, Target 9 (Biodiversity).



Coastal Natural area	Adjacent Terrestrial Natural Area
103 Sheringham to Lowestoft	47 North Norfolk
	48 The Broads
	49 Suffolk Coasts and Heaths
106 North Kent Coast	68 North Kent Plain
107 East Kent Coast	68 North Kent Plain & 69 North Downs
108 Folkestone to Selsey Bill	70 Wealden Greensand
	71 Romney March
	72 High Weald
	73 Low Weald and Pevensey
	74 South Downs
	75 South Coast Plain & Hampshire Lowlands
109 Solent & Poole Bay	75 South Coast Plain & Hampshire Lowlands
	76 Isle of Wight
	77 New Forest
	81 Dorset Heaths

Figure A Coastal and adjacent Terrestrial Natural Areas
(Only Natural Areas relevant to this report are detailed).

For each of the enhancement opportunities identified the report provides brief detail of the issues that require consideration by all parties engaged in reviewing the SMP. The detail in this report is exclusively focused on biodiversity gain and only includes locations where the preferred coastal defence policy could deliver such benefit. In addition to the workshops, this project has included a desk study of existing information including:

- UK Biodiversity Action Plan Targets;
- Local Biodiversity Action Plan Targets;
- English Nature's Natural Area descriptions;
- Joint Nature Conservation Committee Coastal Directories;
- Halcrow *Futurecoast* CD-ROM;
- Pilot CHaMPs produced by the Living with the SEA EU LIFE funded project ; and
- Shoreline Management Plans produced by operating authorities.

Regional Strategic Monitoring Programmes

Defra, in partnership with the Environment Agency and operating authorities in the southeast of England have funded the establishment of the Channel Coastal Observatory as a data management and regional coordination centre for the Southeast Regional Coastal Monitoring Programme (www.channelcoast.org). The programme provides a consistent regional approach to coastal process monitoring, providing information for development of strategic shoreline management plans, coastal defence strategies and operational management of coastal protection and flood defence. It is hoped that the Channel Coastal Observatory will generate environmental information that will inform how shoreline management policy is formulated and implemented with full consideration of impacts on biodiversity. The proposal therefore to establish monitoring programmes in other regions demonstrates the commitment of all those with responsibility for the coastal to deliver sustainable shoreline management.

Shoreline Management Plan policies

Policy time periods

The purpose of the SMP is to inform high level planning and promote sustainable management policies for the coast into the next century, thereby meeting long-term objectives without committing to unsustainable defences. However, it is recognised that there are present-day issues to address and that major changes to existing management practices may not be appropriate in the short-term. The next generation of SMPs will therefore introduce three time periods or epochs of 0-20 years, 20-50 years, and 50-100 years for defining objectives, policy and management changes, to enable progress towards a long-term vision for the coast. For example, in the first epoch a policy of 'Hold the Line' might be promoted, but that it is appreciated that long-term defence is unsustainable and that in the time period 20-50 years there will be a need to adopt a policy of 'Managed Realignment', the long-term vision may therefore be to lead to a coastal section with a policy of 'No Active Intervention'.

Implementation of Policy

At the time the existing SMPs were written, Ministry of Agriculture Fisheries and Food (MAFF) guidance notes (MAFF, 1995) identified the generic shoreline management plan options (Box A). An additional option 'Limited Intervention' was proposed and defined in the 2001 Defra SMP Guidance. However, the development by Defra in 2004 of interim *Procedural Guidance for Production of Shoreline Management Plans* proposes that 'Limited Intervention' is removed as a policy option, but considered only as a means to implement one of the original four policy options. These are:

- Hold the Existing Defence Line;
- Advance the Existing Defence Line;
- Managed Realignment; and
- No Active Intervention.

It should be noted that the term 'do nothing' has been replaced and re-defined as the policy option 'No Active Intervention' and that the previous use of 'Management Units' for

applying policies is to be replaced by 'Policy Units'. To enable the context for this report to be set correctly it is strongly recommended that it is read in conjunction with the most up to date SMP guidance provided by Defra. Further detail can be obtained from http://www.defra.gov.uk/environ/fcd/policy/smp.htm

Box A: Environmental aspects of shoreline management (adapted from FCDPAG5 *Environmental Appraisal* and Defra, 2001)

Environmental implications are fundamental to policy appraisal and selection. The strategic framework provided by SMPs allows environmental implications of policies to be considered over whole sub-cells or cells. Coastal groups and their technical advisors should identify policies that:

- seek to avoid environmental damage; and
- minimise environmental damage where some impact is unavoidable.

They should also:

- identify, in broad terms, suitable mitigation that could be provided to offset residual impacts where possible;
- identify opportunities for environmental enhancement;
- ensure full compatibility with the content of the relevant CHaMP and how it informs the SMP in areas where such documents exist (Figure B); and
- ensure that reference is made to any adjacent Catchment Flood Management Plan to ensure that fluvial defence policies are able to deliver environmental enhancements with particular reference to losses of terrestrial/freshwater habitats that may occur in estuaries or on the open coast through the adoption of 'Managed Realignment'.

Where designated sites are involved, the starting point for policy appraisal must be to minimise risk to the features of interest. Guidance on identifying options is provided in the *Code of Practice on Environmental Procedures* (MAFF/Welsh Office 1996).

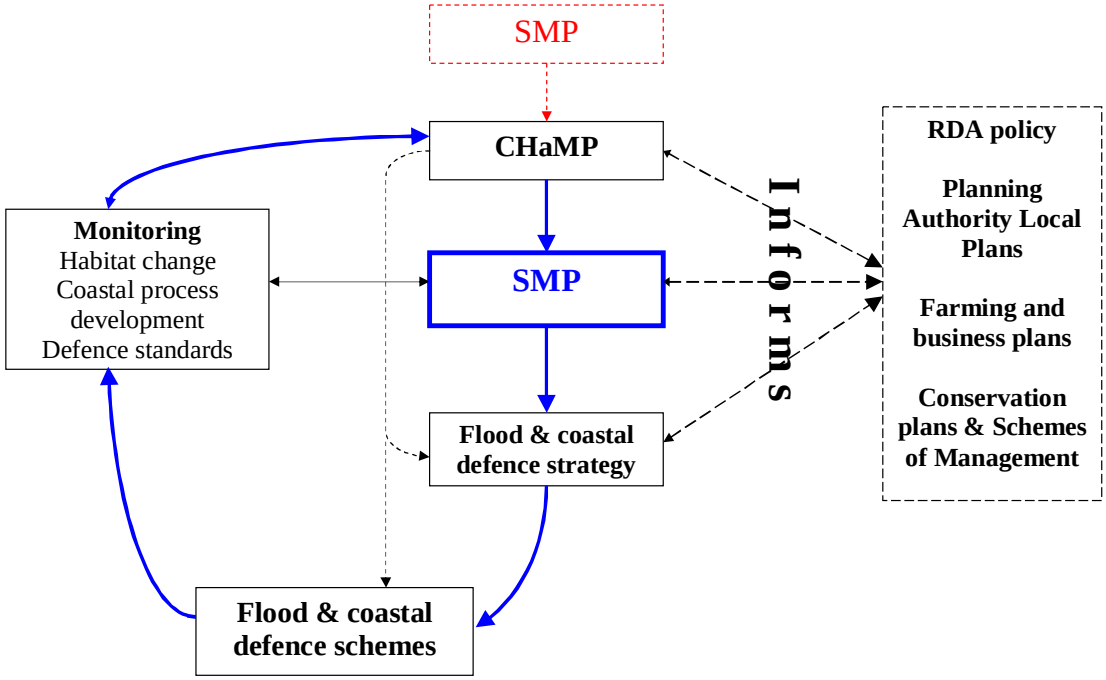


Figure B Schematic of how CHaMPs influence SMP review.

1. Identifying biodiversity opportunities in the Sheringham to Lowestoft Natural Area 104

H Dalton and F Ravaioli, Royal Haskoning

1.1 Description of the Natural Area

The Sheringham to Lowestoft Natural Area consists of the coastline of East Norfolk and North Suffolk. This natural area includes the estuaries of Breydon Water and Oulton Broad, where the area overlaps with the Broads. It also extends offshore out to the 12 mile territorial water limit. The coastline of this Natural Area comprises soft cliffs, with stretches of lower lying land, fronted in most places by linear sand dunes and coastal defences. Beaches are predominantly sand with some pebbles.

The underlying geology is chalk at about sea level in the west, dipping eastwards and being overlain by Pleistocene deposits, which are a mix of freshwater and marine sediments and glacial tills. These deposits are exposed in the cliffs between Sheringham and Happisburgh. The soft cliffs between Overstrand and Mundesley are the highest on the Norfolk coast and are subject to major landslides through a combination of groundwater flows and erosion by the sea. This material is a source of sediment for beaches further east and south. A chalk platform is exposed at West Runton, one of the few areas of intertidal rock in East Anglia.

The coast between Happisburgh and Hemsby is lowlying and mostly fronted by dunes with sea defence structures including offshore reefs south of Sea Palling. The hinterland is northern Broadland with its important freshwater nature conservation interest. Extensive dunes occur at Winterton with a full sequence from pioneer through to fixed dune grassland and dune heath.

Between Hemsby and Lowestoft, the coast is well defended, though low soft cliffs occur in places. Landuse is a mixture of agricultural and urban including holiday camps and associated developments. Dune habitats are found at Great Yarmouth North Denes, which is important for little terns. At the back of Great Yarmouth is Breydon Water, part of the estuary of the Yare, which contains the only saltmarsh and intertidal sand and mud habitats within this Natural Area.

The offshore zone tends to be relatively shallow and sandy, although it deepens to the south. Key features of this Natural Area are a series of offshore sandbanks, known as the North Norfolk Offshore Banks (NNOBs) and a series of nearshore banks which lie closer to the shoreline between Winterton and Lowestoft. These natural banks protect the stretch of coastline between Winterton-on-sea and Lowestoft from waves and currents. Despite this protection and the presence of coast defence structures, the coast here is eroding. The coast is, however, accreting between Caister and Great Yarmouth.

The Sheringham to Lowestoft Natural Area supports a variety of species including the following:

- Nationally significant sand dune habitat supports breeding little tern, grasses such as marram grass, dune fescue, rush leaved fescue and grey hair grass. Dune heath with lichens extensive. Natterjack toads are also present.

- ∉ The cliffs have nationally important Pleistocene exposures containing significant numbers of fossils. These cliffs also demonstrate mass movement in a spectacular way. They support a varied range of invertebrates and maritime plant communities.
- ∉ The chalk platform supports the only hard rock marine communities in East Anglia.
- ∉ Intertidal mud and sand, and saltmarsh areas at Breydon and Oulton are important for wintering waders and wildfowl. There is a typical saltmarsh flora.

The main sites of nature conservation and geological interest present within the Sheringham to Lowestoft Natural Area are shown in Table 1.1. Full details of the designations can be found on English Nature's website (www.english-nature.org.uk).

Table 1.1 National and international designated sites

Site Name	Ramsar	SPA	cSAC	SSSI	Principle Interest
Overstrand Cliffs					Vegetated sea cliffs
Beeston Cliffs					Geological (Beestonian Stage of the Pleistocene)
West Runton Cliffs					Geological (Pleistocene)
East Runton Cliffs					Geological (lower Pleistocene)
Sidestrand and Trimingham Cliffs					Geological (late Cretaceous), mass movement and Pleistocene deposits
Mundesley Cliffs					Pleistocene deposits
Overstrand Cliffs					Pleistocene and upper Cretaceous (Chalk) Cliff top grassland
Happisburgh Cliffs					Geological (Pleistocene deposits)
Winterton - Horsey Dunes					Atlantic decalcified fixed dunes Humid dune slacks Other dune communities
Great Yarmouth North Denes					Little terns Dune communities
Corton Cliffs					Geological (Pleistocene)
Shallam Dykes Marshes, Thurne					Grazing marshes
The Broads					Marshes, dry and humid grassland, heathland, shallow brackish lakes
Yare Broads and Marshes					Wetland, grazing marshes, fen (including the Yare estuary)
Broadland					Wetland habitats, Bittern, Marsh Harrier, Bewick's Swan, Bittern, Hen Harrier, Ruff, Whooper Swan
Breydon Water					Intertidal mudflats, saltmarsh, reedbeds and brackish water communities Common tern, avocet, Bewick's swan, golden plover More than 20,000 waterfowl

Other sites of interest include those identified in Table 1.2.

Table 1.2 Local and national nature reserves and sites

Local Nature Reserve	Breydon Water
National Nature Reserve	Winterton Dunes
AONB	Norfolk Coast
National Park	The Broads
National Trust Site	Horsey Estate
RSPB Reserve	Berney Marshes Breydon Water
Environmentally Sensitive Area	The Broads

1.1.1 Habitats present

Table 1.3 provides a summary of the BAP habitats and interests of national and local significance within Natural Area 104, as defined within the Natural Area profile (http://www.english-nature.org.uk/science/natural/NA_search.asp).

Table 1.3: Summary of habitats in the Sheringham to Lowestoft Natural Area

National Significance	Local Significance
Coastal sand dunes	Coastal saltmarsh
Earth heritage	Littoral sediment
Littoral and sublittoral chalk	
Coastal cliffs and slopes	

1.1.2 Additional information

Geomorphology

In geological terms, the coastline of East Anglia is still responding to changes in the coastal system due to the rise in sea level since the last glaciation, when sea level stood at 65 m below its present level and East Anglia was joined to continental Europe. This has been causing foreshore steepening or beach translation despite the availability of beach building sediment.

The Sheringham to Lowestoft coastline is characterised by unconsolidated deposits of sand and clay and is therefore subject to erosion. Cliff erosion is widespread and locally rapid, and supplies beach-building material for accreting sand dunes and 'nesses'. The 'nesses' are typical of this part of the coastline and are large migratory features, which provide key points of sediment accretion and generally mark a change in shoreline orientation. They are not, in general, geologically controlled and therefore their position is possibly determined by the tidal regime and wave climate, for example Winterton ness.

Within the Natural Area there is a high drift rate of coarse sediment to the south and an overall eastward drift of fine sediment. Both waves and tidal currents play an important role in changing this stretch of coast (Halcrow, 2002).

Coastal processes are influenced by the presence of the North Norfolk Offshore Banks and the nearshore banks between Winterton and Lowestoft. Residual currents develop around these banks and are linked with beach processes. The nearshore banks have a significant influence on local shoreline processes as they alter the inshore wave climate. They are also an integral part of the wider coastal system, and very possibly a significant behavioural

control contributing to holding the coastal position throughout much of the North Norfolk to Harwich area (Halcrow, 2002).

Geology

The solid geology of this coastline is dominated by a variety of later 'drift' deposited by glacial action during the Pleistocene and including material such as tills (boulder clay). Valuable geological exposure is provided by cliffs between Sheringham and Great Yarmouth. A sequence of Anglian tills and associated sands and gravels are exposed. The tills include the (older) red-brown Cromer Till and its equivalent till layers within the Corton Formation of the Great Yarmouth district, and the (younger) olive-grey Lowestoft Till containing conspicuous chalk fragments. The sands and gravels include layers rich in broken shell debris, probably derived from Pleistocene Crag deposits.

In North Norfolk, this glacial sequence has locally suffered intense deformation due to glacial action (contorted drift). At West Runton, the chalk crops out on the foreshore and the glacial drift includes displaced blocks of chalk deposited during the last main glacial period to affect the area. The Cromer Forest Bed, a pre-Anglian organic deposit underlying the glacial drift, outcrops at a number of sites. The underlying Pleistocene Crag is also exposed in a few places.

Landuse and infrastructure

The land use of the Sheringham to Lowestoft Natural Area includes agriculture, residential areas, industry, recreation and tourism. The northern part is dominated by the towns of Sheringham and Cromer, which are mainly residential and holiday towns. The coast between Cromer and Hemsby is largely undeveloped, but includes villages along the cliff tops and in the lee of the dunes. From Hemsby to Lowestoft the landscape predominantly consists of built-up areas, including residential and holiday houses, caravan and camping parks and holiday villages. The port of Lowestoft and Great Yarmouth dominate the seafront together with houses, hotels, amusement arcades and entertainment venues. Other settlements include Caister-on-Sea, Hemsby, Gorleston, and Corton.

Industry is centred around Great Yarmouth with oil and gas service industry and minor fish and food processing activities. It is estimated that around 2,000 people are employed in the oil and gas sector with more than double this figure employed in related sectors such as engineering and construction. Most employment is in Great Yarmouth and Lowestoft and, to a lesser extent, Norwich. At Bacton, there are three gas terminals receiving North Sea gas from ten pipelines, which is a key supporting infrastructure to the sector.

Great Yarmouth is also an expanding commercial port. The port is owned and operated by Great Yarmouth Port and Harbour Commissioners. It has 'ro-ro' facilities, vehicle ferry services to the Netherlands and liquid and general bulk facilities. It is also a supply and fabrication base for the offshore oil and gas industry.

The energy sector is of major importance in the Sheringham to Lowestoft Natural Area. Oil and gas operations are on-going in the southern North Sea, whilst the major wind energy project is the Cromer Offshore Wind Farm. Thirty 140 m high turbines will be built between 4 and 8 miles offshore from Cromer and will be visible from the beach.

A number of marine aggregate dredging licensed areas are found offshore of this Natural Area. Tourism is popular in the Sheringham to Lowestoft area and the major commercial and tourist centres include Great Yarmouth, Cromer, Sheringham, and Hunstanton.

1.2 Biodiversity targets

The Sheringham to Lowestoft Natural Area is covered by several Biodiversity Action Plans (BAPs) of national, regional and local scale. These include:

- UK Biodiversity Action Plan; and
- Norfolk Biodiversity Action Plan.

The intention of setting such BAP targets was to manage the diversity of habitats within the UK to reduce habitat losses and to recognise where habitat increases are required. In order to achieve this, more specific Habitat Action Plans (HAPs) and Species Action Plans (SAPs) have been developed. It is however generally recognised that the conservation of habitats is one of the best methods of protecting species (although there will be some species which may need additional conservation measures).

The targets that are presented below are the HAPs set specifically for this Natural Area as part of the UK Biodiversity Strategy. It should be noted that they are not definitive. As further survey and monitoring work is undertaken, to determine the status and distribution of habitats, the targets can be subject to amendment (see www.english-nature.org.uk/baps/targets).

1.2.1 Sheringham to Lowestoft Natural Area targets

Coastal saltmarsh

- Protect the remaining areas of saltmarsh from erosion. The natural development and spread of saltmarsh should be encouraged.
- **Specific target:** maintain 20 hectares by 2015.

Mudflats

- Maintain and safeguard current extent of intertidal mudflats within the Natural Area. Ensure that Shoreline Management Plans promote policies that will allow natural processes for the creation and maintenance of intertidal mudflats to operate, where practicable, and so sustain the area and quality of this habitat.
- **Specific target:** maintain 500 hectares by 2015.
- Allow the intertidal habitats to find a new balance and provide opportunities for the creation of new estuarine habitats.
- **Specific target:** No target specified by 2015.
- Restore estuarine water quality to ensure existing mudflats fulfill their important ecological and conservation importance (aiming to achieve water quality objectives and nutrient standards) by 2010.

Maritime cliff and slopes

- Seek to maintain the existing maritime cliff resource, by ensuring no further loss to extent or quality of cliff-top semi-natural habitats.
- **Specific target:** maintain 25.5 kilometres by 2015.
- Ensure that Shoreline Management Plans promote policies that will maintain, wherever possible, free functioning of coastal processes acting on maritime cliff and slope habitats.
- Seek opportunities to increase the extent of eroding cliffs over time, by allowing natural processes of cliff mobility to continue. Consider opportunities of freeing up currently protected soft cliffs over the next 20 years, taking into account national guidance.
- Semi-natural cliff vegetation should be maintained (whilst allowing for the dynamic nature of the coast) and consideration should be given to re-creation of coastal grassland, to allow plants and animals to colonise from existing cliff top areas.
- **Specific target:** increase by 10 hectares by 2020.
- Improve by appropriate management the quality of at least 30% of the maritime cliff and slope habitats, including cliff-top grassland and heath, by 2010, and as much as possible before 2015.
- **Specific target:** restore 7.6 kilometres by 2015.

Littoral and sublittoral chalk

- Maintain the chalk platform at West Runton Cliffs SSSI as a viable rocky foreshore habitat. Adopt sustainable management practices for all uses on littoral and sublittoral habitats.

Coastal sand dunes

- Ensure that Shoreline Management Plans promote policies that will allow natural processes for the creation and maintenance of dunes to operate, where practicable, and so sustain the area and quality of this habitat.
- **Specific target:** maintain 446 hectares by 2010.
- Consider opportunities to increase the length of high accreting beaches and foredunes, providing opportunities for bird and mobile dune communities.
- Restore areas of dune heath, slack and grassland and ensure sustainable management through the implementation of traditional grazing (60 ha by 2010).
- **Specific target:** restore 60 hectares by 2010.

1.2.2 Additional biodiversity targets for Norfolk

The Norfolk Biodiversity Action Plan identified an additional habitat of relevance for the Sheringham to Lowestoft Natural Area, the coastal and floodplain grazing marsh and seagrass beds. Coastal grazing marshes are found in the Broads. Seagrass habitat is present in Beydon Water. The following targets are extracted from the Norfolk Biodiversity Action Plan:

- Maintain and where possible enhance eelgrass beds in Norfolk; and
- Maintain the existing grazing marsh habitat extent and its quality.

1.2.3 Existing policies

The Sheringham to Lowestoft Natural Area is covered by the Sheringham to Lowestoft Shoreline Management Plan – Sediment Sub-cell 3B (Halcrow, 1996). The existing policies are illustrated in Figure 2 and listed in Table 1.4 by unit and relative stretch of coast.

Table 1.4 Sheringham to Lowestoft SMP units and policies

Area	Unit No	Existing SMP Policy
Sheringham Lifeboat Station to Beeston Regis Hills	RUN 1	Hold the existing line
Beeston Regis Hill to Cromer, Bernard Road	RUN 2	Managed retreat of the existing line
Cromer, Bernard Road to Cromer Coastguard	RUN 3	Hold the existing line
Cromer Coastguard Lookout to Overstrand, Beach Close	TRI 1	Do nothing
Overstrand, Beach Close to Overstrand, South	TRI 2	Hold the existing line
Overstrand, South to Trimingham, North	TRI 3	Do nothing
Trimingham, North to Trimingham, Beacon Hill	TRI 4	Hold the existing line
Trimingham, Beacon Hill to Mundesley, Seaview Road	TRI 5	Managed retreat of the existing line
Mundesley, Seaview Road to Mundesley, East Cliff	TRI 6	Hold the existing line
Mundesley, East Cliff to Bacton Gas Terminal	BAC 1	Do nothing
Bacton Gas Terminal to Walcott, Ostend Cottages	BAC 2	Hold the existing line
Walcott, Ostend Cottages to Happisburgh, Caravan Park	SEA 1	Managed retreat of the existing line
Happisburgh, Caravan Park to Eccles, Cart Gap	SEA 2	Hold the existing line
Eccles, Cart Gap to Winterton Ness	SEA 3	Hold the existing line
Winterton Ness to Winterton, Beach Road	WIN 1	Hold the existing line
Winterton, Beach Road to Hemsby, Long Beach Estate	WIN 2	Do nothing
Hemsby, Long Beach Estate to Newport Cottages	CAI 1	Hold the existing line
Newport Cottages to Caister Lifeboat Station	CAI 2	Hold the existing line
Caister Lifeboat Station to Great Yarmouth, Salisbury Road	CAI 3	Do nothing
Great Yarmouth, Salisbury Road to Great Yarmouth Pleasure Beach	GYA 1	Do nothing
Great Yarmouth Pleasure Beach to Gorleston, River Yare	GYA 2	Hold the existing line
Gorleston, River Yare to Gorleston, Links Road	COR 1	Hold the existing line
Gorleston, Links Road to Hopton, Cliff Cottages	COR 2	Managed retreat of the existing line
Hopton, Cliff Cottages to Hopton Playing Field	COR 3	Hold the existing
Hopton Playing Field to Corton Caravan Site	COR 4	Managed retreat of the existing line
Corton Caravan Site to Corton Woods	COR 5	Hold the existing line
Corton Woods to Lowestoft, North Denes Car Park	COR 6	Do nothing
Lowestoft, North Denes Car Park to Lowestoft Ness	COR 7	Hold the existing line

1.3 Environmental enhancement opportunities

This section presents the biodiversity opportunities that were identified by members of conservation organisations and local authorities at the workshop. This section is structured by biodiversity opportunity identified at the workshop. In some cases, such opportunities cover a long stretch of coast (covered by a number of SMP policies), in other cases they are specific to one location. In this section, reference is made to the SMP units that require changes and/or recommendations to the existing policies for the opportunity to be undertaken. Such recommendations are also illustrated in Figure 2.

Geographically, the biodiversity opportunities are discussed from the north (Sheringham) to the south (Lowestoft) of the Natural Area.

In addition to identifying biodiversity opportunities, this section also highlights the potential habitat gains and losses relative to the BAP targets and the potential issues where these have been identified during the workshop. However, detailed investigations have not been undertaken to assess the amendment of the current preferred defence policy as this work must be undertaken by the operating authority and the appointed group for reviewing and implementing the SMP.

1.3.1 Enabling natural coastal processes to function

The workshop highlighted that one of the main biodiversity opportunities would be gained by allowing more natural coastal processes to take place, particularly for the stretches of eroding cliffs between Sheringham to Happisburgh (covered by the SMP policies between RUN 1 and SEA 2). There are already some stretches within this area which have SMP policies of "Do nothing" or "Managed realignment". These areas are therefore not included in the following discussion. In addition, where such biodiversity opportunity cannot be achieved because of the presence of important infrastructures and settlement, no policy different from 'Hold the line' was recommended at the workshop. This section considers only the policies that would require changes in the next SMP generation for such opportunity to be implemented.

The SMP units and policies that would require changes for this biodiversity opportunity to be undertaken are the following:

Sheringham Lifeboat Station to Beeston Regis Hills - Unit RUN 1

Current SMP Policy: **Hold the Line**

Cromer, Bernard Road to Cromer Coastguard Lookout - Unit RUN 3

Current SMP Policy: **Hold the Line**

Trimingham, North to Trimingham, Beacon Hill - Unit TRI 4

Current SMP Policy: **Hold the Line**

Happisburgh, Caravan Park to Eccles, Cart Gap - Unit SEA 2

Current SMP Policy: **Hold the Line**

The existing policy of "Hold the line" for the full extent of the above units was justified in the existing SMP by the need to protect assets located close to the coastline. In particular, the policy of Units RUN 1 and 3 is to protect Sheringham and Cromer; the policy of Unit TRI 4 is to protect Trimingham and its coastal road; and the policy of SEA 2 is to protect Happisburgh and other coastal properties.

This coastal stretch is of national importance for its geology and as a sediment supply for the beaches and dunes further south. The SMP policy of "Hold the line" can have a detrimental

effect on the geology of the coastline. The areas affected include Beeston Cliffs SSSI in Unit 1, Overstrand Cliffs SSSI in Unit 3, Sidestrand to Trimingham SSSI in Unit TRI 4 and Happisburgh Cliffs SSSI in Unit SEA 2. Although the existing SMP recognised that the above policies conflict with the requirements for the natural environment, it was argued that the socio-economic value justified such policies.

The requirement to allow a functioning coastal system for geological sites and sediment supply was discussed at the workshop and recommendations to modify the existing SMP policies were put forward. In particular, it was recommended that there is an opportunity to allow more natural coastal processes to operate within part of the SMP units. It was proposed that where no important assets are at risk (eg outside of the towns and villages) a policy of 'No active intervention' might be appropriate to preserve the geological interest of the cliffs and to work toward the achievement of the biodiversity targets of this Natural Area. Such policies would also benefit the ecology of the site, where pioneer communities might become established.

The sites suitable for allowing natural coastal processes include the following:

- the eastern section of Unit RUN1, east of Sheringham;
- the eastern section of Unit RUN 3, north-east Cromer;
- the whole of Unit TRI 4 (Sidestrand and Trimingham); and
- the northern section of Unit SEA 2 north and south of Happisburgh.

It was also discussed that where structures are redundant or have a limited effect on protecting the coast, a case should be made for removing them. It is understood that the removal of coastal defences corresponds to a 'managed realignment' policy under the DEFRA regulations (DEFRA, 2001). Such recommendation was made for the following areas:

- the eastern section of Unit RUN1, East of Sheringham;
- the eastern section of Unit RUN 3, north-east Cromer; and
- the whole of Unit TRI 4 (Sidestrand and Trimingham).

No such option was recommended for the cliffs south of Happisburg in Unit SEA 2.

Opportunities for habitat enhancement of the cliff top were also identified. It was proposed that the creation of semi-natural habitat would increase the ecological interest of the cliffs and, in cases, may affect erosional patterns (ie where current cliff drainage enhances erosion). The land use of the cliff top is mainly agricultural land although there is a golf course in Cromer.

Suggested SMP Policy Unit RUN 1: **Managed Realignment east of Sheringham**

Suggested SMP Policy Unit RUN 3: **Managed Realignment to the east of Cromer**

Suggested SMP Policy Unit TRI 4: **Managed Realignment**

Suggested SMP Policy Unit SEA 2: **No Active Intervention south of Happisburgh**

BAP Gains:	Allow natural processes on maritime cliffs Encourage semi-natural cliff vegetation
BAP habitat affected:	None identified
Considerations:	Sustainability of protecting areas whilst retreating in adjacent locations on an eroding coastline.

1.3.2 Creation of semi-natural habitat on cliff tops

In addition to the units discussed in the previous section, the creation of semi-natural habitat on cliff tops (such as calcareous grassland and scrub) was suggested for the following units:

Cromer Coastguard Lookout to Overstrand, Beach Close - Unit TRI 1

Current SMP Policy: Do Nothing

Overstrand, South to Trimingham, North - Unit TRI 3

Current SMP Policy: Do Nothing

Mundesley, East Cliff to Bacton Gas Terminal - Unit BAC 1

Current SMP Policy: Do Nothing

Walcott, Ostend Cottages to Happisburgh, Caravan site - SEA 1

Current SMP Policy: Managed Realignment

The existing SMP policies recognise the requirement to maintain natural coastal processes and sediment supply from the cliffs and such views were confirmed at the workshop. In particular the above units contain the following sites designated for geological reasons:

- Overstrand Cliffs SSSI;
- Sidestrand and Trimingham SSSI;
- Mundesley Cliffs SSSI; and
- Happisburgh SSSI.

No one in the workshop recommended changes to the existing SMP policies, however changes to the management of the cliff top was identified as a potential biodiversity opportunity. The establishment of semi-natural cliff top edges could give a positive contribution to the achievement of BAP targets.

Particular interest has been expressed for the coastal area south of Mundesley (Unit BAC 1), where a link could be established between Paston Barn (which is important for bats) inland and the cliff top. Although the suggested policy is No Active Intervention, cliff top habitat management would deliver the BAP gain and should therefore be actioned by the relevant parties (eg English Nature and/or County Wildlife Trust).

Suggested SMP Policy Unit TRI 1: No Active Intervention

Suggested SMP Policy Unit TRI 3: **No Active Intervention**

Suggested SMP Policy Unit BAC 1: **No Active Intervention**

Suggested SMP Policy Unit SEA 1: **Managed Realignment**

BAP Gains:	Encourage semi-natural cliff top vegetation
BAP habitat affected:	None identified
Considerations:	Conversion of agricultural land. Determine means of realising BAP gain through agri-environment schemes

1.3.3 Creation of saline habitats

At the workshop, the biodiversity opportunity to create saline habitats was identified for the following unit:

Bacton Gas Terminal to Walcott, Ostend Cottages - Unit BAC 2

Current SMP Policy: **Hold the Line**

It is recognised that the existing SMP policy of 'Hold the line' is justified by the need to protect the properties at Bacton and Walcott together with the Bacton gas terminal, which is of national importance. However, during the workshop, an area for habitat enhancement was identified inland of Keswick and Walcott. It was proposed that the agricultural land could become of higher biodiversity value if managed as a saline habitat with the possible creation of mudflats or saltmarsh. This should be considered as a long term option whereby further studies would be required to assess the feasibility of this opportunity.

Suggested SMP Policy Unit BAC 2: **Managed Realignment to the south**

BAP Gains:	Mudflats and saltmarshes
BAP habitat affected:	None identified
Considerations:	Conversion of agricultural land. Determine means of realising BAP gain through agri-environment schemes

1.3.4 Habitat enhancement

The section below discusses the biodiversity opportunities that have been identified for the following area:

Eccles, Cart Gap to Winterton - Unit SEA 3

Current SMP Policy **Hold the Line**

The existing SMP states 'hold the line' is the preferred strategy to protect the existing development, agricultural land and the Broad. Such a policy is predicted to contribute to the conservation of the existing habitats both in front of and behind the coastal defences. The sustainability of this policy was discussed at the workshop, and a number of biodiversity opportunities requiring a different approach to shoreline management were proposed. A number of options were put forward and are described below:

- ∉ the extension of the offshore reefs of Sea Palling to create a sustainable spit, with some managed realignment of the defences in its lee was discussed, although it was recognised that there would be high costs associated with the work. Also, the feasibility, visual and safety impacts and the overall sustainability of such an artificial coastline is uncertain;
- ∉ two opportunities for habitat enhancement were identified south of the offshore reef at Sea Palling. The first was the creation of acid grassland behind the coastal dunes between Sea Palling and Warren Farm, and the second was habitat enhancement further inland of the dunes and possibly up to the New Cut seawall, to create saline habitats; and
- ∉ an opportunity for coastal habitat creation was also identified between the Horsey Estate and Winterton Ness. If the seawall was removed or unmaintained, an area of low land could be naturally flooded creating areas of mudflat (and potentially saltmarsh) in the medium to long term. Such habitats would be valuable for birds and would greatly enhance the nature conservation importance of the area, which includes Winterton Dunes cSAC. However, investment would be required to control the inflow of seawater and to create a new line of defence further inland to protect the Broads.

It was argued that such a coastal policy might not be achievable within the next generation of SMPs but that once implemented it could be sustainable for the next 20 to 50 years. No suggestions were made during the workshop for habitat enhancement opportunities further than the next 50 years because of the difficulties to predict coastal changes in the very long term. However, the CHaMP contains a proposal to consider the controlled saline inundation of the northern Broads beyond a 50 year period (Cottle, 2003). This option would require significant further study to determine its feasibility.

Suggested SMP Policy Unit SEA 3: Managed Realignment at specific locations

BAP Gains:	Grassland Mudflats and saltmarsh
BAP habitat affected:	Possibly coastal sand dunes
Considerations:	Reversion of agricultural land. Controlled saline transition of the Broads subject to long-term planning

1.3.5 Allow dynamic coastal processes and encourage embryonic dune formation

Biodiversity opportunities for the dunes at Winterton-on-sea were discussed at the workshop and are detailed below:

Hemsby, Long Beach to Newport Cottages - Unit CAI 1

Current SMP Policy: Hold the Line

The 'Hold the line' policy for unit CAI 1 was adopted to maintain the existing dune system and hence protect the low lying flood risk areas and tourist infrastructure. The northern part of this unit contains a coastal dune habitat of European importance (cSAC) with Atlantic decalcified fixed dunes, humid dunes slacks, embryonic shifting dunes and shifting dunes with *Ammophila arenaria.*

At the workshop, the policy of protecting the relic dunes was considered unsustainable in the long term, despite their ecological interest. A policy of 'Hold the Line' for the whole unit was therefore suggested for the second generation of SMPs and a policy of 'Managed Realignment' was proposed for the northern part of the unit. It was also recognised that there are opportunities to encourage the creation of embryonic dunes by managing the coastal strip. It is understood that Great Yarmouth Borough Council is exploring this option.

Suggested SMP Policy unit CAI 1: Managed Realignment in the north

BAP Gains:	Embryonic shifting dunes Allow the functioning of a dynamic coastal system
BAP habitat affected:	Possibly Atlantic decalcified fixed dunes
Considerations:	Management approach adopted by Great Yarmouth Borough Council

1.3.6 Encourage embryonic dune formation and create semi-natural habitat on cliff tops

The coastal stretch between the south of Happisburgh and Lowestoft is mainly sandy beaches backed by dunes, with coastal defences present along most of the coastline. The opportunity to enhance the dune habitat between Winterton-on-Sea and Hopton-on-sea was discussed at the workshop. This area relates to the following SMP units:

Newport Cottages to Caister Lifeboat Station - Unit CAI 2

Current SMP Policy: Hold the Line

Caister Lifeboat Station to Great Yarmouth, Salisbury Road – Unit CAI 3

Current SMP Policy: Do Nothing

Great Yarmouth, Salisbury Road to Great Yarmouth, Pleasure Beach - Unit GYA 1

Current SMP Policy: Do Nothing

Great Yarmouth, Pleasure Beach to Gorleston, River Yare - Unit GYA 2

Current SMP Policy: Hold the Line

Gorleston, River Yare to Gorleston, Links Road - Unit COR 1

Current SMP Policy: Hold the Line

Gorleston, Links Road to Hopton, Cliff Cottages - Unit COR 2

Current SMP Policy: Managed Retreat

Hopton, Cliff Cottages to Hopton, Playing Field - Unit COR 3

Current SMP Policy: Hold the Line

Hopton, Playing Field to Corton Caravan Site - Unit COR 4

Current SMP Policy: **Managed Retreat**

The need for the above policies were recognised at the workshop, however two opportunities to increase the biodiversity of this coastline were suggested. The first was to enhance the formation of shifting embryonic dunes for the area between Winterton and Hopton (Units CAI 1, 2, 3, GYA 1, 2, COR 1, 2 and 3). The second was to manage the cliff top in Units COR 2 and 4 for semi-natural habitat. Both options would require habitat management to be delivered by relevant stakeholders (eg English Nature, County Wildlife Trust) rather than changes to the existing SMP policies.

Suggested SMP Policy for Unit CAI 2: **Managed Realignment**

Suggested SMP Policy for Unit CAI 3: **No Active Intervention**

Suggested SMP Policy for Unit GYA 1: **No Active Intervention**

Suggested SMP Policy for Unit GYA 2: **Hold the Line (with dune habitat management)**

Suggested SMP Policy for Unit COR 1: **Hold the Line (with dune habitat management)**

Suggested SMP Policy for Unit COR 2: **Managed Realignment**

Suggested SMP Policy for Unit COR 3: **Hold the Line (with dune habitat management)**

Suggested SMP Policy for Unit COR 4: **Managed Realignment**

1.4 Findings

The environmental enhancement opportunities that have been identified during the workshop, and that are recorded in this report, would contribute to the achievement of some of the national and local biodiversity targets for the following habitats:

- maritime cliffs and slopes;
- coastal sand dunes; and
- saline habitats.

In particular, most of the opportunities identified seek to establish a free functioning coastal system. To a limited extent, opportunities have been identified for saline habitats. More detailed studies would have to be undertaken to recognise the feasibility and sustainability of such opportunities. An evaluation of the extent and quality of habitat gained would be needed to determine how the opportunities satisfy the specific targets. In order to realise the biodiversity opportunities identified at the workshop, changes to the current SMP policies are suggested. Table 1.5 summarises the current policies and the suggested changes required.

Table 1.5 Current and suggested SMP policies

SMP unit no.	Current SMP policy	Suggested SMP policy
RUN 1	Hold the Line	Hold the Line with Managed Realignment east of Sheringham
RUN 3	Hold the Line	Hold the Line with Managed Realignment east of Cromer
TRI 4	Hold the Line	Managed Realignment
SEA 2	Hold the Line	Hold the Line with No Active Intervention south of Happisburgh
BAC 2	Hold the Line	Hold the Line with Managed Realignment to the south
SEA 3:	Hold the Line	Hold the Line with Managed Realignment at specific locations
CAI 1	Hold the Line	Limited Intervention in the north, Hold the Line in the south

Other opportunities identified at the workshop would not require specific changes to the existing SMP policies, but comprise adjacent conservation management activities to deliver BAP gain. Such recommendations are included in Table 1.6.

Table 1.6 Current policies with suggested management recommendations

SMP unit no.	Current policies	Suggested management recommendations
TRI 1	No Active Intervention	Cliff top habitat management
TRI 3	No Active Intervention	Cliff top habitat management
BAC 1	No Active Intervention	Cliff top habitat management
SEA 1	Managed Realignment	Cliff top habitat management
CAI 2	Hold the Line	Dune habitat management
CAI 3	No Active Intervention	Dune habitat management
GYA 1	No Active Intervention	Dune habitat management
GYA 2	Hold the Line	Dune habitat management
COR 1	Hold the Line	Dune habitat management
COR 2	Managed Realignment	Dune and cliff top habitat management
COR 3	Hold the Line	Dune habitat management
COR 4	Managed Realignment	Dune and cliff top habitat management

1.5 References

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2. Opportunities for promoting biodiversity North & East Kent Coastal Natural Areas Natural Area 106 North Kent Coast; Natural Area 107 East Kent Coast

P Doody, National Coastal Consultants

2.1 The setting - Natural Areas 106 and 107

The contract specifies the review should take place of two maritime natural areas and to "identify potential sites for the restoration and improvement of coastal habitats" within these areas. The coastal habitats cannot be separated from the hinterland, indeed some of the terrestrial areas were themselves formerly tidal land, such as the former Wantsum Channel. In order to consider possible areas for the creation of new habitat, it is important to consider these adjacent areas also. The location of the two natural areas situated along the north and east Kent coasts (106 North Kent Coast; 107 East Kent Coast respectively) is shown in Figure 2.1. The margins of natural areas 68 (the North Kent Plain) and 69 (North Downs) abut onto areas 106 and 107 and are considered in relation to the potential for habitat recreation below. The location of these areas in relation to the OS National Grid is also shown in the Figure 2.1.

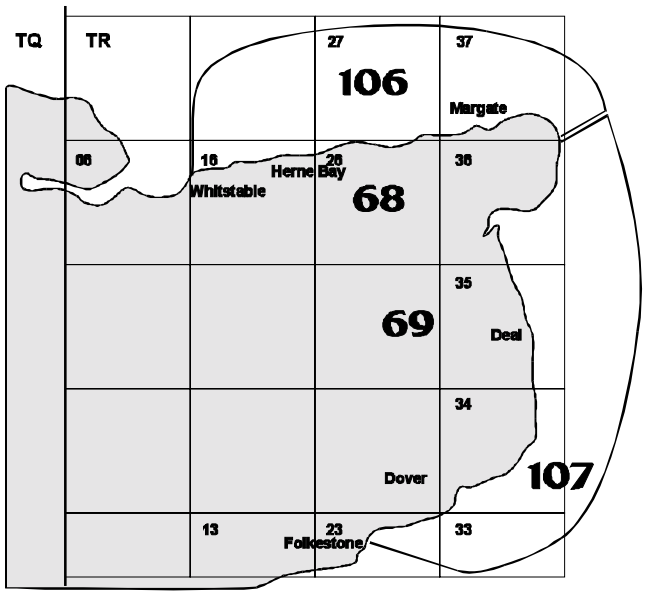

Figure 2.1 Location of the Coastal Natural Areas for North and East Kent and the OS 10km Grid Squares

2.1.1 National data and local information

In an attempt to set these two Natural Areas in context, summary data on the location and size of the main coastal formations are presented below. These data are from several sources, but include information from the JNCC Coastal Resources data base and presented in the Coastal Directories Volumes (Barnes *et al* 1995). Table 2.1 provides a summary of the main coastal habitat information where this is available for England and the county of Kent. The figures for the individual natural areas 106 and 107 are derived from measurements taken on OS

1:50,000 maps and related to the OS 10km Grid squares. In assigning habitats to a particular section of coast 1:25,000 maps provided useful additional topographic information.

Care should be taken in making direct comparison between these figures. Whilst the length measurements were obtained from the same source (OS 1:50,000 maps) and are comparable, the original data for the habitat area figures are derived from different ones, and are not. For some habitats such as "mixed sediments" at MHW and "other" at HW the information is defuse. In the case of the former it was difficult to establish the balance between the different sediment types from the maps; whilst the latter category is a catchall for shores where the OS maps do not provide an adequate indication of the type of habitat present to landward. In many instances, as for example along the north Kent coast, the limit may be some form of artificial structure such as a revetment (protecting a cliff) or land with no specific habitat feature. In Table 2.1 these lengths at high water have been added together.

Despite these caveats they do provide a first level, quantitative assessment of the main habitat features present. In their turn these provide an indication of the relative value in relation to England (and Great Britain) and more specifically in this case for the Natural Areas on the north and east Kent coast.

Table 2.1: Summary habitat information for England

	England	**Kent County**	**Natural Area 106***	**Natural Area 107***
Habitat length @ MHW				
Inter tidal mud		95.5km		0.5km
Inter tidal sand		26.5km	7.5km	8.0km
Inter tidal shingle		28.5km	0.5km	14.0km
Inter tidal mixed sediments		88.5km	19.0km	23.5km
Inter tidal rock		12.0km	4.5km	7.5km
No obvious inter tidal		19.0km		6.5km
Salt marsh		140.5km		5.5km
Habitat length @ HW				
Shingle ± vegetation	297.0km	27.5km		10.0km
Sand dune	325.0km	6.0km		5.0km
Sea cliffs 'soft'	256.0km	9.0km	7.5km	
Sea cliffs 'hard'	909.0km	31.0km	6.5km	17.0km
Artificial embankment	1764.0km	167.5km	{ 17.0km	{ 31.5km
'Other'	2028.0km	107.5km		
Habitat area				
Tidal flats	150865km	7,002.0ha	95.0ha	536.0ha
Saline lagoon		217.0ha	Not distinguished	Not distinguished
Salt marsh	31,533.0ha	1,345.0ha		73.0ha
Sand dune	9,282.0ha	499.0ha		466.0ha
Shingle	4,353.0ha	59.0ha		**147.0ha
Maritime cliff grassland	1,895.0ha	74.0ha	Not distinguished	Not distinguished
Coastal grazing marsh		10,622.0ha	Not distinguished	Not distinguished

NB The figure for England and Kent are taken directly from the Coastal Directories volume 7. *Estimates for each natural area are based on data derived from 10km squares, measured at a scale of 1:50,000. ** The shingle figure excludes Dungeness. A gap in the table should not be taken that the habitat is absent but rather that it was not obvious on the maps used.

These data show the significance on a national scale of the cliff habitat within both Natural Areas. The ratio between the lengths of sedimentary inter-tidal habitat when compared to the area of tidal flats also helps indicate the narrowness of the shore on the north coast. By comparison the dune area, whilst not large in national terms, represents a major proportion of

the habitat in Kent. The true significance of these figures lies in the insight they would give to the wider England and GB picture if this approach was undertaken for the whole of the English coastline.

*[**Comment**: Summary data of this kind helps with the identification of the key habitats within the natural area in relation to the national resource. This in turn provides a guide to the relative importance of a particular habitat at different administrative scales. This approach is developed further in the next section. 10km squares have been used to present the data since they provide a standard reference point which is unlikely to change, unlike local authority boundaries. They also help in making comparisons across the country as a whole and can more easily be linked to the Countryside Survey 2000, which is also registered to the National Grid. The categories themselves could be refined and linked to the terminology used in Halcrow's 'Futurecoast' CD-ROM to provide a more up to date and relevant database.]*

2.1.2 The nature of the coast

A more detailed representation of the coastline can be obtained by plotting the information for each 10km square in sequence along the coast. As with the national data provided above, this cannot replace the detailed knowledge of English Nature's area teams, especially when considering local action. However, it does provide information which consistent for the whole country. The nature of the offshore inter-tidal sediments, as indicated by the length of the main habitats at Mean High Water is indicated in Figure 2.2 The shift from tidal mud to sand along the north coast and in the vicinity of the chalk cliffs is clear. To the south the presence of a varied mixture of sediment types, including shingle shores is also apparent.

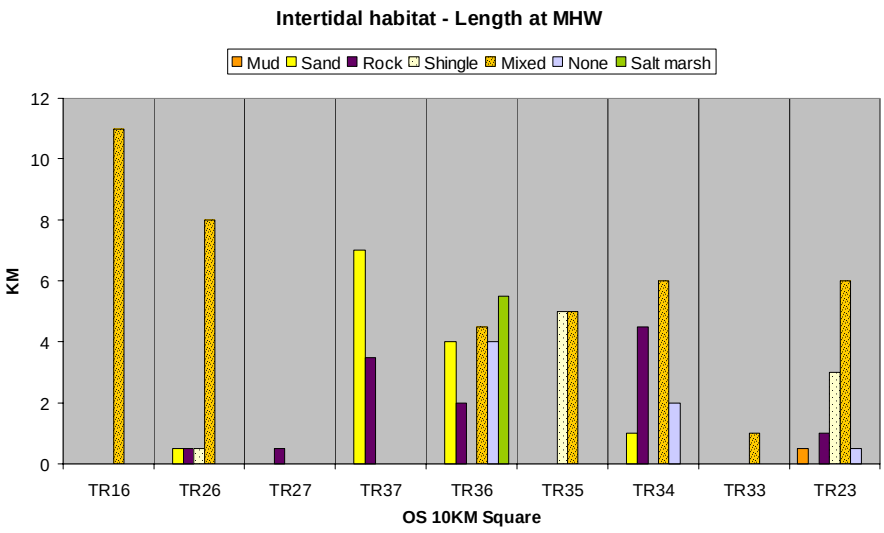

Figure 2.2 Coastal habitats by length at Mean High Water

An indication of the nature of the interface between the land and the sea is shown by the length of each habitat along the upper, High Water margin (Figure 2.3). The distribution of habitats illustrates the change in the shoreline from a predominantly mud/sandy inter-tidal area to the west to one with rock and sandy embayments to the east. The more complex sequence of habitats towards Sandwich Bay is clearly shown as is the shift to rockier substrates and sand/mud shores to the south.

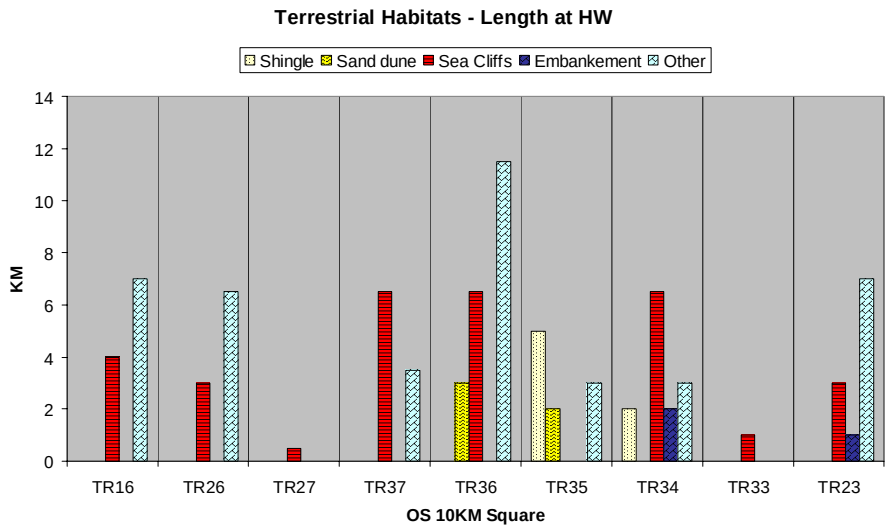

Figure 2.3 Coastal habitats by length at High Water

The importance of sea cliffs is illustrated by the representation of this habitat at High Water. The 'other' category subsumes within it lengths of coast with shores backed by coastal defence features, including sea walls and groynes. With the exception of outer reaches of the Thames Estuary and in Sandwich Bay where there are extensive dunes, the coastal fringe exists as a narrow margin between the land and the sea. The narrowness of the foreshore has important consequences for the ability of the coast to sustain a rising sea level and increased storminess without loss of habitat. The presence of shingle and sand around Sandwich Bay again reflects the importance of these habitats in this area. None of these conclusions is surprising; this general picture is known already and presented in the Natural Area profiles prepared by English Nature. However the data do provide a simple quantitative measure of the size of the habitat resource relative to the length of coast. This is further illustrated, for the main coastal habitats, by reference to the area data presented below (Figure 2.4).

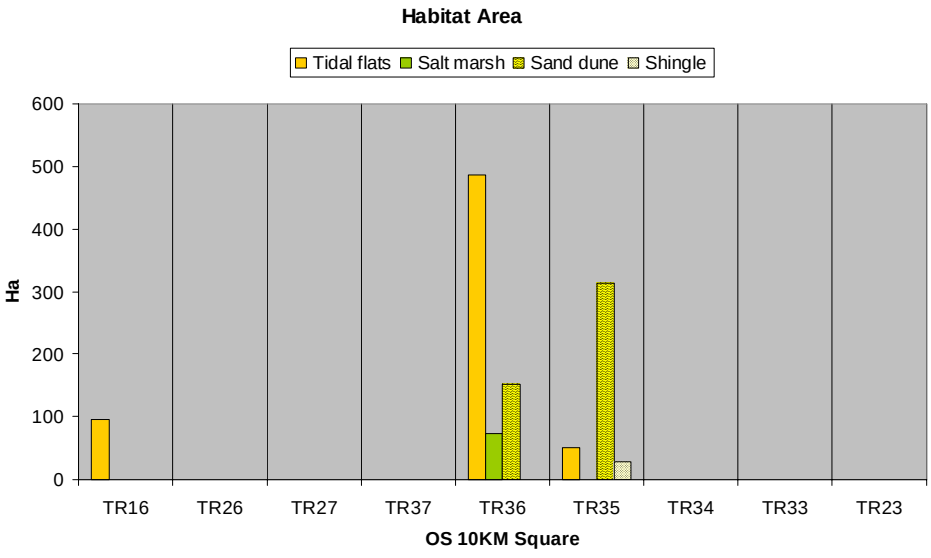

Figure 2.4 Area of coastal habitats

*[**Comment**: These data are presented to help inform the descriptions of the two Natural Areas. They show the baseline information used to identify the coastal enhancement opportunities in the desk study (as required in the contract). In a wider sense they also highlight the local contribution of coastal habitats to the regional and national resource. In this way they can help identify particularly significant areas of individual habitat. At the same time, if linked to local information about habitat loss, they can direct attention to areas with the greatest potential/need for habitat restoration. The more detailed information available from the UK coastal habitats surveys (sand dunes, saltmarsh and shingle) has not been incorporated but could be reworked to update the information presented here, see also comments on 'Futurecoast' above.]*

2.1.3 Coastal defence

The narrowness of the shore and relative instability of the coastline is reflected in the extensive sea defences and coastal protection features which dominate major lengths of this coast. The detailed Shoreline Management Plan for the north Kent coast, prepared by Halcrow (1996), gives a section by section description of the features for most of the two Natural Areas. Of particular relevance to the discussion here is the presence of substantial lengths of coastline protected by a variety of coastal structures including sea walls, revetments and gryones. When combined with beach recharge schemes there has been a major investment in coastal defence throughout the area.

The section of coast from Whitstable in the west to Reculver in the east is dominated by residential and other development. Small sections of coast are undeveloped, notably at Swalecliffe. The structures continue until the cliffs slopes at Bishopstone which are undefended. Hard defences again protect the coastline at Reculver including the remains of St Mary's Church - a notable tourist attraction. The SMP indicates that erosion along this front has largely been arrested by the coastal protection measures that have been taken. In their absence the cliffs would continue to erode. This is especially the case along the coastline from Bishopstone to Reculver where slope instability and landslides occur.

From Reculver to Minnis Bay the low-lying coast is protected from flooding by a sea wall fronted by a shingle beach. In part this has been the subject of recharge to reinforce the narrowing shore profile. Over the last 100 years or so there has been no evidence of a major realignment of the shore along this section of coast.

Major structures predominate from here along the frontage of the towns including Margate where at the toe of the chalk cliffs concrete revetments are present. This strongly defended coast continues along the north shore, extending to the south along the east facing coast. Undefended chalk cliffs occur in a few places such as Botany Bay and North Foreland where cliff-top residential development is limited. Broadstairs and Ramsgate lie above chalk cliffs which are defended by sea walls

Pegwell Bay presents an entirely different picture. Here the estuary of the River Stour consists of sequence of habitats including sand and shingle foreshore, sand dunes, saltmarshes and coastal grazing marsh. The seaward habitats are mostly undefended and continue to show natural mobility as channels shift and sediment movement takes place. The dunes themselves provide a sea defence which is to some extent maintained by the golf courses which seek to maintain the established pattern of dune ridges and slacks.

At Deal and again at Dover substantial coastal protection prevents cliff erosion. In between shingle shore or chalk platforms help to prevent wave attack and erosion. South from Dover the cliffs of Folkestone Warren are protected at their toe by sea walls, though this does not prevent the periodic slumping of the cliffs.

The situation along the low-lying coastline in relation to **sea defence** can be illustrated by the works undertaken at Reculver. Here the remains of St Mary's Church have been protected for some time. Figure 2.5a and b shows the nature of the coast looking east before 1928 and the situation in 1997 and shows that the protection immediately in front of the church is similar between the two dates, whilst the defences have been extended to the west (in the foreground of the picture).

Figures 2.5a and 2.5b St Mary's Church, Reculver 1928 and 1997

Where the cliffed coast has been protected a variety of structures have been used including concrete sea walls, revetments and the like. The coastline in the vicinity of Broadstairs illustrates the nature of the change. Eroding chalk cliffs are obscured by coastal protection works are shown in Figures 6a and 6b. The copy of the engraving by William Daniell (Figure 2.6a) is taken from a book by David Addey 1995 who repainted the scenes between 1988 and 1990 (Figure 2.6b).

Figures 2.6a and 2.6b Broadstairs showing chalk cliffs, unprotected in 1822 and in 1988

The discussion which follows takes its cue from the "Policy appraisal - Key Issues" identified in the Department of Environment, Food and Rural Affairs SMP Guide, in particular:

∉ The potential opportunities for environmental improvement (eg regeneration of tourism infrastructure), **conservation** or more **efficient shoreline management**…."

The most recent Report of the Policy Commission on the Future of Farming and Food *FARMING & FOOD - a sustainable future*, January 2002 also gives a lead.

Both of these documents provide important pointers to identifying enhancement opportunities.

These are discussed in relation to the five key shoreline management options written into the DEFRA guide.

2.2 Part 1 - Area 106 North Kent

The North Kent Coast Natural Area faces the outer reaches of the Thames Estuary. The adjacent coastal waters are turbid and relatively cold, being cut off from the effects of the Gulf Stream. The coastline can be considered in three sections:

1. to the west the underlying geology is dominated by deposits of London Clay, unusually these 'soft' rocks may form cliffs up to 50 m high;
2. the intermediate section is low-lying and has older (than the London Clay) Tertiary deposits;
3. the Isle of Thanet to the east is composed of Chalk with cliffs and shore platforms.

Offshore the geology mirrors that on the coast, though the sub-tidal chalk extends a relatively short distance offshore. The area is subject to a relative rate of sea level rise which is estimated to be +2 mm per annum. The seabed is shallow, sloping to a depth of only 10 m. Tidal range is 4.5 m and maximum tidal currents range from 1.0 to 1.25 m/s, mean spring tides. There is a sub-cell boundary at North Foreland.

2.2.1 Nature of the coast - "what it looks like now"

The underlying geology helps to define Natural Area 106 which comprises the coastal margin and extends offshore. The coastline itself is narrow and has significant lengths, though only limited areas of maritime habitat. This is a reflection of the 'relatively' restricted sediment availability. Figure 2.7 (below) provides a broad indication of the distribution and type of habitats present along the coast and the location of the main Sites of Special Scientific Interest.

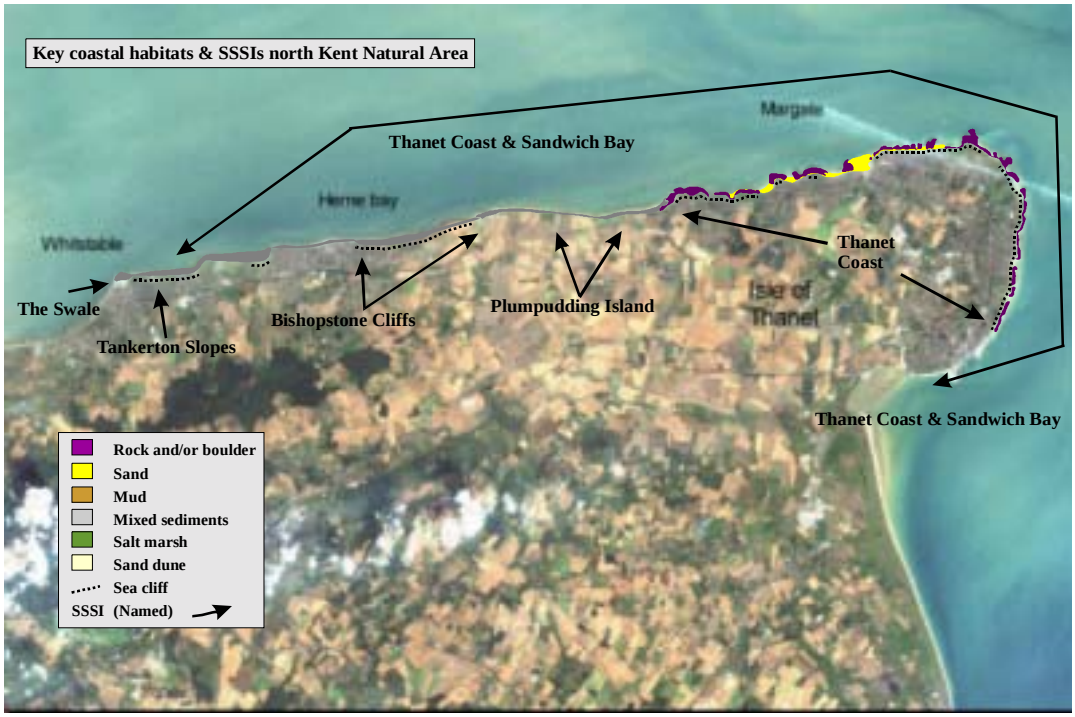

Figure 2.7 Principle habitats and protected areas North Kent Coast

Figure 2.7 is derived from a variety of sources including OS 1:25,000 information, coastal habitat urveys (where available) and a series of maps showing areas sensitive to oil pollution (prepared for the Marine Pollution Control Unit, Department of Transport with support of the British Petroleum Company PLC and published by the Nature Conservancy Council in 1990). [NB the mixed inter-tidal sediments are all shown as a grey tone]. Table 2.2 details the international site designations in north Kent.

The figure shows the extent of urban development and its close proximity to the cliffed coast, both the 'softer' rocks to the west and the chalk cliffs to the east. In the centre of the area the low-lying land which includes the former Wantsum Channel and the wider alluvial plain is predominantly agricultural land.

Protected sites in North Kent

Table 2.2 Summary of protected sites in North Kent

Site Name	Ramsar	SPA	cSAC	Principle interest
The Swale Estuary (part only in Natural Area)	V	V		SSSI, Inter tidal flats, saltmarshes, coastal grazing marsh, wintering water fowl
Thanet Coast			V	SSSI, coastal chalk wave cut platform and cliffs
Thanet Coast & Sandwich Bay	V	V		SSSI, candidate Special Areas of Conservation. Rare bird species; Internationally important numbers of wintering turnstone *Arenaria interpres*; nationally important numbers of six wintering species. - SAC **Reefs** (M),
Tankerton Cliffs (2ha)				SSSI, Coastal cliffs & maritime grassland
Bishopstone Cliffs (56ha)				SSSI, Coastal cliffs & woodland
Plumpudding Island (91ha)				SSSI, shingle beach & coastal wetland / lagoon

*[**Comment**: A more detailed description of the area can be found by reference to the descriptions of natural areas in the English Nature CD-ROM "Natural Areas: Nature conservation in context" 106 and 68, the North Kent Plain which lies immediately adjacent to the coast. Detailed information on the SSSIs is available from English Nature's area teams and no attempt is made to reproduce this in this report. The summary information is provided to give an indication of constraints and opportunities for biodiversity enhancement, in relation to the limitations which could be imposed on protected conservation areas].*

2.3 The Shoreline Management Plans

The coastline of Natural Area 106 is described in detail in a SMP plan prepared by Halcrow in 1996. The plan contains descriptions of the coast and the statutory protection afforded to it. The maps include assessments of the current coastal defence structures, their condition and a prediction of the evolution of the coastline for a 'do nothing' option in 2005 and 2070. Based on the information contained within the plan a review of policy responses and the implications for biodiversity are given next.

2.3.1 Policy responses

The analysis in the SMP clearly shows that for most of the coast in Natural Area 106 the trend is towards continuing erosion. Because of the rising sea level along this coastline this trend is expected to continue. The fringing beaches and sedimentary flats will steepen and retreat and with it the protection afforded by these habitats to the coast. This will put the existing protective structures and unprotected cliffs under greater pressure from tidal and wave action. The shingle shore, including that within the Plumpudding Island SSSI, will also come under pressure as it attempts to 'role over' in the face of rising sea level.

The increase in rainfall and incidence of storms, which appears to accompany climate change, may also cause greater potential for the cliffs to slump and erode, especially on the less resistant London Clay cliffs to the west. The low-lying agricultural land and habitats behind the sea wall will flood more frequently as the sea wall is over-topped due to higher sea levels and the incidence of storms. This has the potential to affect the salinity of the soils and with it their agricultural value. Again demand will increase for maintenance and/or improvement of the coastal defences. The Chalk cliffs and shore platforms to the east will recede further. Because of the close proximity of the town of Margate, more effective protection measures will be demanded, further obscuring the key inter-tidal chalk habitats and cliffs.

The protection of the major part of this coastline from retreat will continue to be a major commitment for the foreseeable future. The towns of Whistable, Herne Bay and Margate will ensure that the existing defences will at the very least have to be maintained, though rising sea levels will probably demand improvements over time. The situation along the low-lying coast is less clear cut. Because of the extensive area of arable, which is vulnerable to flooding the presumption is for this section of coast to be protected.

2.3.2 Implications for biodiversity

The SMP for the north and east Kent coast clearly shows that a 'do nothing' policy is not an option for large stretches of the shoreline in this Natural Area. The combination of relatively unstable cliffs, a rising sea level (relative to the land) and substantial residential and industrial

development dictate that some form of intervention will have to take place if existing infrastructure is not to be compromised.

Overall, maintaining the coastline in its present position in the face of rising sea level (the preferred option along much of this section of the coast) will have major implications for the existing wildlife of the area. It will certainly result in a major long term loss of coastal habitats as the narrow fringing inter-tidal areas become even narrower and steeper. The desire to increase the protection afforded to built-up areas will become more intense. Although beach recharge (especially in the vicinity of Plumpudding Island SSSI) might help its survival the potential for the shingle beach to 'role-over' will remain and the long-term viability of the site is unclear.

2.4 "Opportunities for biodiversity enhancement"

English Nature's national biodiversity targets are set out in *UK Biodiversity Group, Tranche 2 Action Plans - Maritime Species and Habitats.* Within the context of Natural Areas more specific targets have been identified. Preliminary targets were given in the Natural Areas CD-ROM *Nature Conservation in Context* (English Nature 1998), but subsequent amendments have occurred therefore information about current targets should be obtained from www.english-nature.org.uk/baps/intro.htm. Those relevant to Area 106 are summarised below in Table 2.3. The full list of national targets is given in Annex 1.

2.4.1 Biodiversity enhancement opportunities by habitat

The opportunities for enhancement along this section of coast would appear to be limited, based on the predictions of erosion and the position of the coast in 2070 in relation to residential and other infrastructure. A brief review of each habitat is given below. For each, an attempt is made based on the descriptive information presented above, to identify the implications of each policy option based on the shoreline management options, namely:

- hold the existing defence line;
- advance the existing defence line;
- managed realignment;
- no active intervention.

A more detailed appraisal is given for those habitats or locations where the study has revealed opportunities for significance enhancement may exist.

Littoral & sub-littoral chalk

Maintaining those sections of the rocky foreshore which are unprotected remains the prime conservation objective. Because this habitat is significant on a national scale (as indicated by the extent of the national and international designations described above) any opportunities for removing artificial protective structures, which may exist should be investigated. See also below under 'hard' rock cliffs.

Lagoon

The only lagoonal area is small. Maintaining this habitat within the Plumpudding Island SSSI may be compromised by the rising sea level. Options for recreating additional lagoon habitat could be incorporated into any scheme for habitat creation behind the shingle beach and sea wall. This is discussed further below in relation to the section on low lying land and Figures 2.8 and 2.9.

2.4.2 Cliffs

There are two aspects to the enhancement of biodiversity of the cliffs within this area. Firstly in areas where there is little infrastructure at risk, then a policy of 'do nothing' may be appropriate. This is already the situation in areas such as Bishopstone SSSI. Actively facilitating the reactivation of some of the less stable cliffs and thus helping to recreate open habitat of value for both plants and invertebrates, is an option. On the softer rock cliffs (in the region of Bishopstone - Reculver) sediment released from the cliffs could also act as a source for recharge of the beaches further west, as long-shore drift moves material along the coast. Artificial beach recharge which could be associated with 'hold the line' would have a similar effect.

Cliff slopes - 'soft'

Decisions on destabilising cliff slopes will depend very much on local circumstances. The length of cliff which potentially could provide such opportunities lies largely within the Bishopstone Cliff SSSI. It could be argued that to take this relatively limited approach leaves the possibility of further loss as coastal protection measures are extended and strengthened and in the longer term simply leaves a less sustainable coast than before as erosion accelerates. Allowing the cliffs to continue to erode albeit at a controlled rate would provide opportunities for new habitat to be formed and increase the availability of sediment to feed the beaches to the north and west. This could extend along a stretch of coast approximately 1km within the eastern end of the SSSI which is not backed by dwellings. This represents approximately 14% of the 'soft' rock cliff within the Natural Area.

Cliff slopes - 'hard'

The chalk cliffs of the Thanet SSSI are of considerable importance and considered to include marine elements of international value. Reducing the length of cliff obscured by concrete by 10% would represent a significant contribution to the national target of restoring littoral and sub-littoral chalk. As with the consideration of the 'soft rock' cliffs the opportunities will depend very much on local circumstances in relation to the presence of human habitation.

On the harder, chalk cliffs the situation is similar, though the sediment released is less. Release of some of the cliffs from protection could also increase to possibility of developing maritime grassland in those areas backed by agricultural land. It has to be stressed that the opportunities for this approach will be restricted. However, identifying this option is entirely in line with the national (and local) Biodiversity Action Plans which are concerned with maritime cliff and cliff-top habitat. A summary of the options is given below in Table 2.3.

Table 2.3 Shoreline management options for 'hard' rock chalk cliffs

Advance the existing defence line	Not an option. The habitat cannot be created in this way.
Hold the existing defence line	The preferred coastal protection option in most areas. May require new and improved structures causing further habitat deterioration.
Managed realignment	Not appropriate.
No active intervention	Best option for biodiversity allowing wildlife communities to develop.

2.4.3 Low-lying agricultural land

Reference to the Environment Agency's "Indicative Floodplain Maps" for south east England shows the extent of the land at risk from flooding. They show there are areas of land where flooding might take place at Whitstable and Herne Bay and again between Reculver and Minnis Bay. The opportunity for biodiversity enhancement in the former areas is limited or non-existent due to the presence of residential property. However, the area of low-lying land in the latter is largely in arable cultivation apparently with few residential or other properties. According to the local authority plans it is also in an area where the risk of flooding has resulted in a policy where there is a presumption against development. For these reasons a detailed review of the options for biodiversity enhancement are discussed below.

Biodiversity enhancement opportunities - Reculver to Minnis Bay

Overall the biodiversity targets for this Natural Area are fairly modest. However, looking at the coastline from a wider perspective may suggest some additional opportunities. Whilst the enhancement of the cliffed landscape is impeded by the need to protect property, the low-lying land is much less constrained (at least by buildings). The area is mostly in arable cultivation and lies below the 10m contour. The land is formed from alluvial and marine sediments originally derived from tidal land associated with the Wantsum channel which cut off the Isle of Thanet from the mainland. The area is prone to flooding and the defences were over-topped in the 1953 flood. This threat continues and thus makes some areas of this land potentially suitable for recreating a variety of coastal wetland habitats.

The low-lying arable land lies to the south of the sea wall between Reculver and Minnis Bay and is largely within Natural Area 68 (North Kent Plain). The railway line and a substantial inland sea bank mark a landward limit within which there are no significant buildings. Beyond the railway line there is a further area of low-lying land. The area is bounded to the east and west by rising ground. The possible options for enhancing biodiversity is this area are discussed more fully for this area against the five generic policies available to shoreline managers and provided in the DEFRA Guide.

Advance the existing defence line

As has already been intimated above this option is not viable. The rising sea level and narrow foreshore would make any attempts unlikely to be sustainable.

Hold the existing defence line

This is the current option which will probably be effective against all but the most severe storms and tidal surges. The loss or narrowing of the beach would lead to the eventual need for more substantial defences. These could include realignment to a former sea wall to the

south X-X on the map in Figure 2.8. The effect of this would be the likely loss of some or all of the features within the Plumpudding Island SSSI. A small gain in inter tidal foreshore might result but this could be short-lived given the rising sea level along this stretch of coast.

Managed realignment

A breach or breaches in the sea wall in the vicinity of Plumpudding Island holds out the possibility of recreating a substantial area of coastal wetland. Given the origins of the soils, the height above high water and the nature of the sea walls inland this might revert to saltmarsh. Although coastal grazing marsh is not present within Natural Area 106 and appears not to have been present in the adjacent Area 68, at least in recent times, with the right control of sea water ingress grazing marsh could eventually be created. A first stage realignment could use the existing sea wall (marked Y-Y in Figure 2.8) and the railway line as the limit for tidal inundation. These defences would be strengthened.

Figure 2.8 Main 'set-back' lines for habitat recreation and creation within a flood risk area

The shingle and lagoon/wet grassland in the SSSI might be lost, but it would be compensated for by much more extensive alternative habitat. Depending on the gradients and soils types, there is the possibility of developing a variety of different habitats ranging from saltmarsh to tidal lagoon and transitional brackish marsh and freshwater swamp.

A second stage, longer term realignment plan which might go beyond the railway line as far as the 5m contour could be considered (roughly shown by a dotted line Z-Z in Figure 2.8). This could provide a potential 'wash' zone where grazing marsh could be developed in areas where flooding is allowed on very high tides and during storms. This land would not only provide an enhanced biological resource but also has the potential to provide flood relief for adjacent lands (Table 2.4).

Table 2.4 Summary of possible biodiversity enhancement options low-lying areas in Area 106 (68)

Habitat	Local action (Suggested key shoreline management option)	Area / length now	Potential enhancement
Saline lagoon	Protect existing lagoon (**Limited intervention**)	3.5ha	3.5ha
	Extend existing lagoon X2 (**Realignment**)		3.5ha
Saltmarsh*	Recreate by breaching shingle/sea wall (**Realignment**)		50.0ha
Coastal grazing marsh*	Recreate from arable land - Stage 1 (**Realignment**)		250.0ha
Wash lands*	Recreate from arable land - Stage 2 (**Realignment**)		>250.0ha

* Habitat created in Natural Area 68

No active intervention

Allowing this area to evolve without interference could provide opportunities for creating a sequence of habitats ranging from saltmarsh, to brackish and freshwater marsh. As the sea walls break down sea water will inundate more and more land to the south. This uncontrolled option is probably not appropriate in this area.

2.4.4 Summary of potential biodiversity enhancement opportunities

A summary of the opportunities for enhancing biodiversity in the Natural Area is given in Table 2.5 below. Based on the information identified above the options appear to lie mostly in line with those included in the Shoreline Management Plan. No attempt has been made to define specific areas though it is recognised that in keeping with the local biodiversity targets that these appear to be achievable.

2.4.5 North Kent Natural Area 106

Table 2.5 Summary of most relevant biodiversity targets for Natural Area 106

Habitat	National target	Natural Area BAP Target	Comment / Policy for area
Littoral & sub-littoral chalk	Recreate/restore areas affected by coastal protection structures	Maintain habitat quality. Minimise adverse impacts from coastal defences, all cliffs, 12 kilometres by 2015	**Managed realignment** Consider options for removing artificial structures, 0.5km Thanet Coast
Saline Lagoon	Create 120 ha new habitat over 20 years	Maintain 2.3 ha. Consider opportunities for creating new habitat	**Mnaged realignment** Maintain small lagoon in Plumpudding Island SSSI
Coastal grazing marsh	Restore 10,000 ha degraded grazing marsh. Recreate 2,500 ha (from arable land)	Restore 60ha; create 40ha from arable land (Area 68)	**Managed realignment** Not in Area 106 but could be accommodated in Area 68, North Kent Plain - see Table 2.4 above for more details
Sea cliffs	Maintain 4000 km together with the functioning of coastal processes and where possible increase the area of habitats unaffected by coastal defence and other engineering works Improve by appropriate management the quality of at least 30% of the maritime cliff and slope habitats, including cliff-top vegetation, by 2010. Restore dynamic mobility to cliffs affected by coastal protection structures and increase area cliff slope and cliff top vegetation by 500ha over the next 20 years	Maintain 13.5 km by 2015. Seek opportunities to increase the extent of eroding cliffs over time Increase the area of cliff-top semi-natural habitats by minimum of 10 ha by 2020 Restore 4 km by 2015	Along whole coast **Managed realignment** Options available in Tankerton Slopes and/or Bishopstone Cliffs up to 1km **Managed realignment** Largely associated with the chalk cliffs of Thanet 0.6km

Most of the opportunities for biodiversity enhancement are mostly in line with current approaches. The above discussion of the low-lying land behind the Plumpudding Island SSSI suggests that considerable additional enhancement opportunities exist within this Natural Area. Realignment could easily meet the annual national target of 40ha of grazing marsh recreated from arable land.

2.5 Part 2 - Area 107 East Kent

The East Kent Coast Natural Area faces east. The adjacent coastal waters are turbid and relatively cold, being cut off from the effects of the Gulf Stream. The coastline can be considered in three sections:

1. to the north the underlying geology of the Isle of Thanet dominates with chalk cliffs up to 30 m high;
2. the low-lying land around Pegwell Bay is overlain by blown deposits whilst the bay itself is estuarine mud and sand deposits;
3. south from the sand dunes of Sandwich, chalk cliffs dominate the coast and include the steep 'White Cliffs of Dover' and the undercliffe at Folkestone Warren.

Offshore the sea bed shelves to 10m in the north and relatively steeply towards the Channel in the south, sloping to a depth of 20 - 40m. The geology is dominated by chalk and flint except in the vicinity of Pegwell Bay where clays, silts and sand dominate. The coast is subject to a relative rate of sea level rise which is estimated to be +2 mms per annum. Tidal range rises from 5m in Pegwell Bay to 6.5m near Folkestone. The maximum tidal currents range from 1.0 to 1.75 m/s, mean spring tides. The long-shore drift from North Foreland Point is north to south and from Folkestone to Pegwell Bay south to north. There is a sub-cell boundary at Dover Harbour.

2.5.1 Nature of the coast - "what it looks like now"

The underlying geology helps to define Natural Area 107 particularly the chalk cliffs to the north and south. The cliffed coastline is narrow with shore platforms below and maritime cliff habitat above. Pegwell Bay represents a significant area of inter tidal habitat with the major representation of tidal flats and saltmarshes within the two Natural Areas. The wind-blown deposits of sand form an important series of sand dunes. Figure 2.9 (below) provides a broad indication of the distribution and type of habitats present along the coast and the location of the main Sites of Special Scientific Interest, listed in Table 2.6.

Protected sites East Kent

Table 2.6 Principle SSSIs East Kent Natural Area

Site Name	Ramsar	SPA	SAC	Principle interest
Thanet Coast			V	SSSI, coastal chalk wave cut platform and cliffs
Thanet Coast & Sandwich Bay	V	V		SSSI, candidate Special Areas of Conservation. Rare bird species; Internationally important numbers of wintering turnstone *Arenaria interpres*; nationally important numbers of six wintering species. - SAC Reefs (M),
Sandwich Bay to Hacklinge				Embryonic dunes, Shifting dunes with *Ammophila*,

Site Name	Ramsar	SPA	SAC	Principle interest
Marshes			V	Fixed (grey) dunes & Dunes with *Salix arenaria*
Kingsdown and Walmer Beach				Shingle beach and chalk cliffs
Dover to Kingsdown Cliffs				Chalk cliffs, shore platforms and maritime grassland
Folkestone Warren			V	Chalk cliffs, undercliff

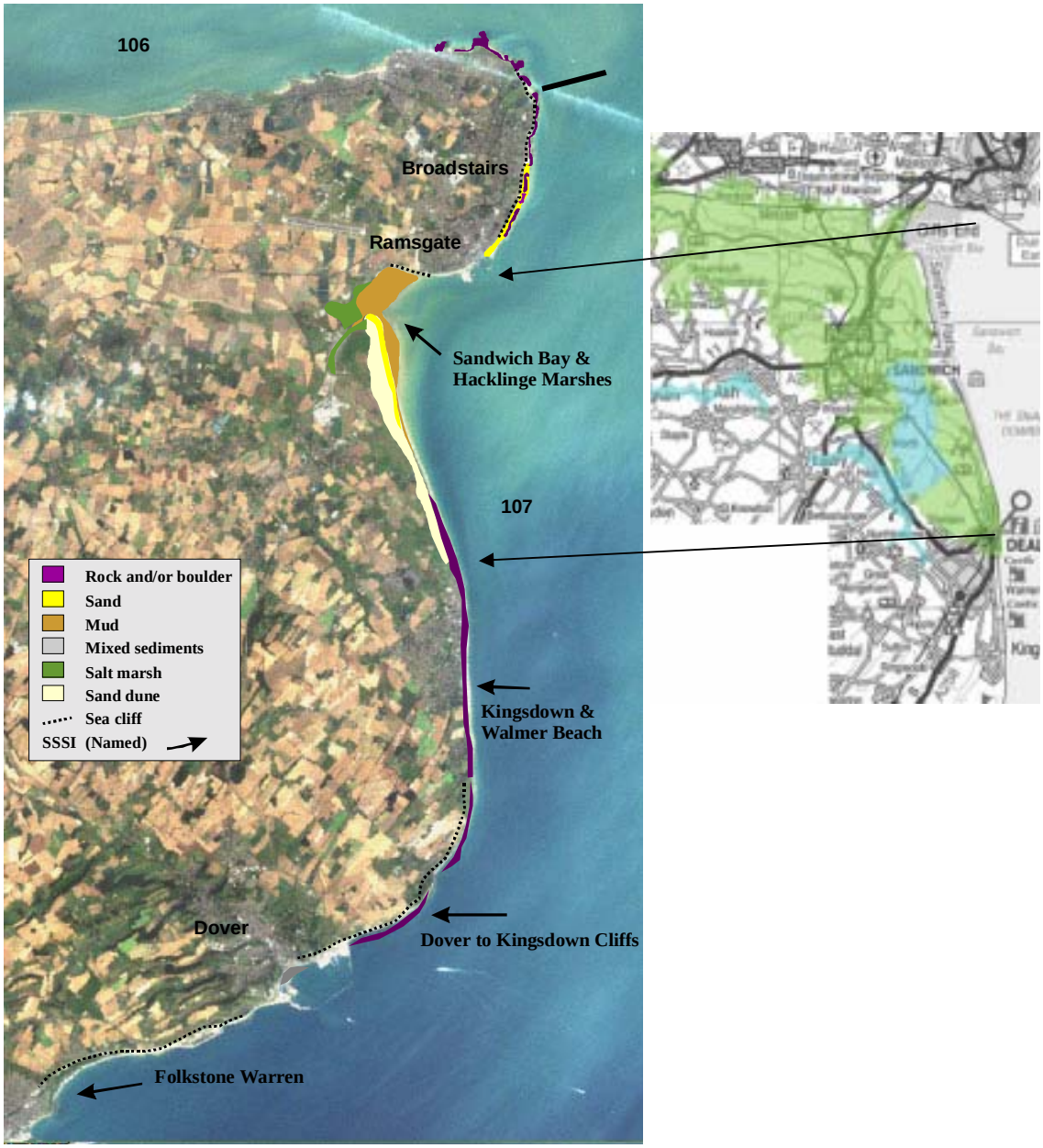

Figure 2.9 Habitats, SSSIs and low-lying land East Kent Natural Area 107

The figure is derived from a variety of sources including OS 1:25,000 information, coastal habitat surveys (where available) and a series of maps showing areas sensitive to oil pollution (prepared for the Marine Pollution Control Unit, Department of Transport with support of the British Petroleum Company PLC and published by the Nature Conservancy Council in 1990). [Figure 2.9 above gives a better representation of the distribution of the different habitat types.]

The figure shows the extent of urban development at Broadstairs and Ramsgate which is fronted by steep chalk cliffs and a chalk platform. Sections of the cliff are protected from erosion. These are interspersed with other, unprotected areas. Deal is protected by flood defences. From here to Dover the chalk cliffs are mostly undefended. The harbour of Dover and the land around the Channel Tunnel include the harbour walls and the spoil dump at Shakespeare cliff obscure the foreshore. Folkestone Warren includes a sea wall along much to the seaward frontage.

2.6 The Shoreline Management Plans

Part of the coastline of Natural Area 107 as far as Dover Harbour is described in detail in the Shoreline Management Plan (SMP) prepared by Halcrow (See above). The area links with the SMP Beachy Head to South Foreland. Base on the information contained in this SMP a discussion of policy responses and the implications for biodiversity is given.

2.6.1 Policy responses

Because of the generally rising trend in sea level along this stretch of coast, the cliffs and low-lying land will continue to come under greater threat. The fringing beaches and sedimentary flats will steepen and retreat as the protection afforded by these habitats is reduced. This will put the existing protective structures and unprotected cliffs under greater pressure from tidal and wave action.

The analysis in the SMP shows that for most of the coast in Natural Area 107 the trend is towards continuing erosion. Although the rates are less severe than in Natural Area 106 there are significant threats to life and property. The general policy at Broadstairs and Ramsgate is ‘hold the line’ in keeping with the need to protect the considerable residential and other infrastructure on the cliff top.

The loss of habitat predicted within the Sandwich Bay area and the consequent threat to low-lying agricultural land and habitats behind the sea walls from flooding suggests major coastal defences could be recommended. The SMP predicts the potential loss of flood defences which protect the extensive areas of marshes in the area. The presence of several major golf courses poses a further incentive to prevent such erosion taking place.

Further potential damage is most likely in the vicinity of Deal, where relatively small losses of sea defence structures could threaten large areas with flooding. The need to maintain the defences here is clear. The shingle shore, including that north of Kingsdown which protects the toe of the cliff, will also come under pressure as it attempts to ‘role over’ in the face of rising sea level.

Between Kingsdown and Dover erosion rates are relatively slow. At the same time the cliff top has an open landscape, significant areas of which are owned by the National Trust. The situation is different at Folkestone Warren where the chalk overlays the unstable Gault Clay. Whilst the toe of the cliff appears to be protected and relatively stable the increase in rainfall and incidence of storms, which appears to accompany climate change, may cause greater potential for the cliffs to slump and erode. The implications for the railway line which runs through the undercliffe are obvious bearing in mind the major landslip which overwhelmed it earlier last century.

2.6.2 Implications for biodiversity

The rising sea level (relative to the land) and substantial residential and industrial development around Broadstairs, Ramsgate, Deal and Dover dictate that the existing coastal defences will have to maintained in these areas. The chalk cliffs and inter-tidal foreshore will come under greater pressure and some areas may be lost. By contrast in other areas the policy options encompass the 'do nothing' strategy. There seems little prospect of the chalk cliffs in the south from being protected as neither life nor property are threatened. This probably means that the cliffs will continue to erode allowing for the maintenance of cliff slope vegetation.

The greatest potential implications occur at Sandwich Bay. Here attempts to protect the dunes and other habitats form erosion will compromise many of the features for which the site has been established. Building defences in the dunes to provide flood protection will destroy existing features for which the site is designated.

2.7 "Opportunities for biodiversity enhancement"

English Nature's national biodiversity targets are set out in **UK Biodiversity Group, Tranche 2 Action Plans - Maritime Species and Habitats**. Within the context of the local Natural Areas more specific targets have been identified. These are given by Natural Area in the Natural Areas CD-ROM "Nature Conservation in Context" (English Nature 1998). Those relevant to Area 107 are summarised in Table 2.2. The full list of national targets is given in Annex 1. Details of the Natural Area targets are given on English Nature's website.

2.7.1 Biodiversity enhancement opportunities by habitat

The predictions of erosion and the position of the coast in 2070 in relation to residential and other infrastructure, suggest that there is little scope for enhancement along the northern section of cliffed coast. However there appear to be opportunities associated with all the restoration of cliff top communities in several areas. The options are considered for each habitat in relation to the five main shoreline management policies of:

- hold the existing defence line;
- advance the existing defence line;
- managed realignment;
- no active intervention.

A more detailed appraisal is given for those habitats or locations where the study has revealed opportunities for significance enhancement may exist. These relate principally to the Sandwich Bay area where the pressure for increasing protection could compromise biodiversity in the area.

Lagoon

Maintaining lagoonal habitat would appear not to be threatened by allowing the dune to 'role over' in the face of continuing erosion. Options for recreating additional lagoon habitat could be incorporated into any scheme for habitat creation behind the sand dune/saltmarsh complex.

Vegetated shingle

In several places shingle shorelines protect cliffs and other habitats, notably south of Deal. Opportunities for maintaining these or even extending them by beach feeding may provide opportunities for restoring vegetated shingle. Thus it should certainly be possible to protect the existing habitat in the context of the SMP bearing in mind their sea defence value.

Chalk Cliffs to South Foreland

There are two aspects to the enhancement of biodiversity of the cliffs within this area. Firstly in areas where there is little infrastructure at risk, then a policy of 'do nothing' is appropriate. This is the situation within the Dover to Kingsdown Cliffs SSSI. Actively facilitating the reactivation of some of the chalk cliffs and helping to recreate open maritime cliff-top grassland is an option in some areas particularly as there is a reasonable area of undeveloped cliff-top land. The local biodiversity targets appear to be attainable, especially within land owned by the National Trust. From Kingsdown to South Foreland the coastal defence option is 'do nothing'.

Chalk Cliffs and Undercliffe Dover to Folkestone

South of Deal a cliffed coastline predominates where there is little infrastructure at risk. The policy of 'do nothing' is appropriate in many cases here. This is the situation within the Dover to Kingsdown Cliffs SSSI. Actively facilitating the reactivation of some of the chalk cliffs and helping to recreate open maritime cliff-top grassland is an option in some areas particularly as there is a reasonable area of undeveloped cliff-top land. The local biodiversity targets appear to be attainable. Whilst more active intervention is required around Dover Harbour and again along the toe of Samphire Hoe (the location for the spoil from the Channel Tunnel) and at the seaward base of Folkestone Warren (Figure 2.10) elsewhere the policy is 'no intervention'.

Figure 2.10 The foreshore at Folkestone Warren showing the toe protection and the undercliffe behind

Low-lying agricultural land

Reference to the Environment Agency's "Indicative Floodplain Maps" for south east England shows the extent of the land at risk from flooding and tidal inundation. Closer inspection shows that the dunes and dune ridges are not included in the risk zones. They indicate that there are extensive areas of land at risk from flooding by freshwater (blue) and the sea (green) between Pegwell Bay and Deal in Figure 2.11 above. The opportunities for biodiversity enhancement in the former area depend on the approach adopted to the predicted flooding and erosion of the dunes. In the vicinity of Deal the options are limited or non-existent due to the presence of residential property.

2.7.2 Biodiversity enhancement opportunities - Sandwich Bay

The predicted erosion of the shore along this section of coast, if correct, implies an extensive landward migration of the dunes. The evolution of the coast has been in a series of spits which have progressively enclosed Pegwell Bay. This process is still active at Shell Ness, though both erosion and accretion take place in response to tides, waves and sediment availability. The shoreline to the south has a sequence of sandy foreshore and mobile dunes, which also show a sequence of erosion and accretion (Figure 2.11).

Figure 2.11 Foreshore north of Prince's Golf Links and broomrape on sea-holly

Whatever, the progression, as sea level rises, there will be pressure for landward movement of the mobile habitats. Coupled with the major threat of flooding along the River Stour the demand for improved sea defences may be seen as irresistible. Past sea defence activity suggests there may be pressure for the dunes to be reinforced.

*[**Comment**: Proposals have been made in the past to erect sea defences in the dunes. Artificial structures of this kind are not appropriate in such a dynamic habitat. Not only will they destroy vegetation along the line of the structure but they will also compromise the natural evolution of the dune. The reservoir of sand held in the dune provides a means of replenishing beaches eroded during storms and can contribute to this natural sea defence.]*

The location

The estuarine/sand dune system lies to the south and west of the mud and sand flats of Sandwich Bay. The SSSI includes the only major sand dune system in south east England and together with the associated saltmarsh transitions and coastal grazing marsh is of the high conservation interest. The River Stour marks a significant boundary to the south and west. Between the river and the dunes is an area which has a variety of agricultural land ranging from low quality grazing pasture and grazing marsh to arable. Figure 2.12 shows the seaward portion of the area concerned. The uncoloured land is largely dune. The area prone to flooding from the sea (shown in green) make up large sections of the hinterland.

Figure 2.12 Areas of land prone to flooding by the sea, Area 107 (EA Indicative Flood Maps 2001)

Advance the existing defence line

Artificially advancing the coastline is probably not appropriate for sedimentary shores which move naturally between periods of accretion and erosion, especially those within important conservation areas, as here. Facilitating accretion of new mudflats and/or saltmarsh might help meet targets for habitat re-creation but they would interfere with the dynamic processes associated with the site. Sustaining these processes is one of the objectives of the management strategy and part of the reason for its identification as a cSAC.

Hold the existing defence line

The preferred sea defence option. From a biodiversity point of view this option is likely to lead to an overall loss of interest. The movement of the foreshore landward will increase the demand for the reinforcement of the dune. Beach recharge is an option but it is not clear if sufficient sediment is available to achieve this along such a long shoreline. Other 'soft' engineering such as dune stabilisation techniques may be possible, but again the scale of action could be considerable.

The threat from increased flooding is also clear. Again a 'hold the line policy will lead to the need for increased and higher sea defences. The costs could be substantial.

Managed realignment

Managed realignment is a possible policy option. There are considerable areas where flooding could extend the area of coastal wet grassland and with it the opportunities for enhancing biodiversity. It seems unlikely that this option would be pursued as a more limited intervention could achieve considerable enhancement.

No active intervention

The national biodiversity plan for sand dune clearly favours the continued mobilisation of dune habitat as part of a functioning coastal system. In this regard Sandwich Bay dunes are no exception. As the sea level rise and the incidence of storms increase, the dune front would role landwards affecting the recreational facilities and overwhelming the agricultural land as indicated above. As the embankments enclosing the river break down, sea water would inundate more and more land behind the dunes. Allowing this area to evolve without interference in this way would provide opportunities for maintaining and possibly re-creating a sequence of habitats ranging from saltmarsh, to brackish and freshwater marsh. This uncontrolled option may not be appropriate, but it does provide a basis for discussion, particularly in relation to introducing the 'limited intervention' option. It would clearly be the preferred option if the **full expression** of the natural dynamic of the site were to be realised.

2.7.3 Summary of potential biodiversity enhancement opportunities

In looking at the opportunities for enhancing biodiversity in the Natural Areas it is assumed that the basic requirement - to protect or enhance existing habitat remains the primary aim. The targets given in Table 2.7 attempt to summarise the situation and include limited reference to maintaining the current status of the habitats. Based on the information developed above, an attempt is made to suggest potential targets for recreating and/or restoring habitat within the Natural Area.

2.7.4 East Kent Natural Area 107

Table 2.7 Summary of biodiversity targets Natural Area 107

Habitat	National target	Natural Area BAP Target (from English Nature website)	Comment/policy for the area
Saline lagoon	Create 120 ha new habitat over 20 years	Maintain 21ha by 2005	**Hold the line** Protect artificial lagoon in Sandwich Bay SSSI?
Saltmarsh	Maintain the existing extent approx. 45,500 ha, and restore to 1992 levels. Create 40 ha per annum to replace the 600 ha lost between 1992 and 1998	Safeguard current extent of saltmarsh. Encourage development and spread. Maintain 100ha by 2015	**Hold the line** Protect existing saltmarsh Sandwich Bay SSSI
Coastal grazing marsh	Restore 10,000 ha degraded grazing marsh. Recreate 2,500 ha (from arable land)	No specific coastal target	Targets relate to inland grazing marsh especially in the Stour Valley
Vegetated Shingle	Prevent further net loss from the 5800 ha. Where damage has been extensive and natural recovery is not likely, restore habitat by 2010	Maintain 60ha vegetated shingle structures by 2015	**Hold the line** The Walmer shingle beach south of Deal

Habitat	National target	Natural Area BAP Target (from English Nature website)	Comment/policy for the area
Sand dune	Protect the existing resource of 54,500 ha encouraging new dunes to accrete and where possible by allowing mobile dune systems to move inland. Offset expected net losses of about 2% over 20 years Up to 1000 ha lost to forestry, agriculture or other human uses to be reinstated by 2010	Maintain 480 ha, restore 60 ha & increase by 10 ha by 2010	**Managed realignment** Within the Sandwich Bay dune. Allowing the habitat to role inland and/or flood will help achieve the targets. Although the golf courses represent a constraint on action there is potential to restore additional habitat
Sea cliffs	Maintain 4000 km together with the functioning of coastal processes and where possible increase the area of habitats unaffected by coastal defence and other engineering works Improve by appropriate management the quality of at least 30% of the maritime cliff and slope habitats, including cliff-top vegetation, by 2010. Restore dynamic mobility to cliffs affected by coastal protection structures and increase area cliff slope and cliff top vegetation by 500ha over the next 20 years	Maintain 30 km by 2015. Consider opportunities of freeing up protected cliffs over the next 20 years, taking into account national guidance. Increase by 10 ha by 2020 maritime vegetation, restore 9 km cliff habitat by 2015	**No active intervention** Chalk cliffs - Opportunities exist along much of the chalk cliffs to the south between Deal and Dover for creating cliff-top grassland **Hold the line** Folkestone Warren and Samphire Hoe - along the toe of the cliffs **No active intervention** Abbot's Cliff and Shakespeare Cliff. The continued periodic slumping of the Folkestone undercliffe is a requirement for the maintenance of biodiversity in this part of the site

The above discussion suggests that enhancement opportunities exist throughout this Natural Area. For the most part the Shoreline Management Plan options conform to the biodiversity requirements. The threat to life and property preclude alternative approaches in several areas. Elsewhere opportunities for biodiversity enhancement are available. A principle issue would appear to be the reaction to the predicted erosion along the frontage of the Sandwich Bay dunes. Adopting too aggressive a protection strategy both in terms of sea defence and maintenance of existing nature conservation interest would in the long term result in the degradation of this important site.

2.8 Comments and conclusions

2.8.1 Shoreline management plans

Two very different shoreline management plans were inspected in order to provide an indication of the main coastal defence policy options adopted for individual stretches of coast. The more detailed of these produced by Halcrow was in fact quite difficult to interpret. The wealth of information was more suited to the detailed appraisal of individual schemes than in providing an overall assessment for policy formulation. The second SMP for the southern part of Natural Area 107 was much easier to follow with a clear summary for each unit in the plan area of its key characteristics, coastal processes, existing coastal defences and preferred strategy.

2.8.2 Prescriptive maps

It is recognised that the maps provided here may be too explicit to be published in their present form. However, it is hoped that the discussion of the opportunities against the coastal defence policy options helps redress this problem. It is assumed the land is predominantly in arable cultivation or other agricultural use behind the sea wall in most areas. Use of the Countryside 2000, Landcover Map discussed above might provide a means of redressing this information gap.

2.8.3 Opportunities

The information presented here provides an illustration of the approach which could be adopted in any future appraisal. In terms of meeting the contract specification to identify additional enhancement opportunities two principle issues emerge:

1. the possibilities for adding to the areas of tidal habitats and coastal wet grasslands in the North Kent Coast Natural Area;
2. the need to consider the implications of the predicted erosion along the front of the Sandwich Bay sand dunes and the opportunities for adopting a less interventionist approach to flooding.

2.8.4 Assessment of the process

This work has attempted to provide an indication of the areas where biodiversity enhancement might be attempted. It has been possible in some areas to suggest geographical limits on the areas which could potentially be involved. For others, particularly length of cliffs with coastal protection structures an indication only can be given of the potential opportunities.

2.9 References

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3. Biodiversity opportunities within the Folkestone to Selsey Bill Natural Area 108

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3.1 Description of the Natural Area

The Folkestone to Selsey Bill Natural Area extends from Folkestone in the east to Selsey Bill in the west, covering approximately 135 kilometres of coastline.

The majority of this largely south-facing coast is very low-lying and heavily defended against flooding and erosion, although extensive stretches of both chalk and clay cliffs exist, which are of particular geological interest (eg Beachy Head). In the case of cliff faces of geological interest (eg Folkestone Warren, Hastings Cliffs) continual exposure of the cliff face as a result of coastal processes is fundamental to their value.

With the exception of the cliffs, much of the coastline is shingle, with shingle or sand extending beyond the low tide mark. Locations of coastal shingle include the cuspate foreland of Dungeness, shingle beach at Rye Harbour, Climping beach and Shoreham beach. These sites support a selection of the most important shingle vegetation communities in the UK and have significant ornithological value.

Regions consisting of muds and silts occur within Pagham Harbour in the west and the estuaries of the Arun, Ouse, Cuckmere and Rother to the east. Saltmarsh is a relatively rare habitat around the coastline, however small areas of saltings are established at Rye Harbour, within the River Adur and at Pagham Harbour. Localised dune systems (eg Camber and Greatstone) are also of significance and are extremely vulnerable to defence and recreational pressures.

Saline lagoons, which support highly restricted lagoonal species, are also a feature of this Natural Area (e.g Rye Harbour Lagoon and Tidal Pool at Cuckmere Haven). Areas of grazing marsh are present (eg Walland and Romney Marshes) together with lagoons and ditches (including the Pett Levels) which provide freshwater and brackish water habitats for a variety of species.

For the most part, the sea bed slopes gently to a depth of about 50 m. Rocky areas are not a principle feature of the sublittoral, but rocky shore sites rich in marine algae are present at Copt Point, Folkestone. Sublittoral habitats also include submerged chalk cliffs with vertical faces up to 4 m generally running parallel with the land. Chalk reefs occur below the chalk cliffs between Brighton and Eastbourne and continue some way into the sublittoral. Between Folkestone and Dover and around Beachy Head chalk clay and greensand substrates support diverse littoral and sublittoral communities.

The following table (Table 3.1) summarises the main nature conservation and geological designations in the Folkestone to Selsey Bill Natural Area. Full details of the designations can be found on English Nature's website (www.english-nature.org.uk) and in the JNCC coastal directory (JNCC, 1998).

Table 3.1 Internationally and nationally designated sites within Natural Area 108

Site Name	Ramsar	SPA	cSAC	SSSI	Principle Interest
Folkestone Warren					Biological, geological and physiographical interest. Marine and terrestrial habitats associated with chalk cliffs, and the underlying Gault clay and Lower Greensand.
Dungeness					Annual vegetation of drift lines, perennial vegetation of stony banks.
Dungeness and Pett Levels					Intertidal areas and coastal waters, standing water, vegetated shingle, grassland and arable habitats, grazing marsh habitat.
Rye Harbour					Shingle, grazing marsh, saltmarsh, intertidal sands and muds and geological interest.
Walland Marsh					Grazing marsh and unimproved dune grassland.
Camber Sands and Rye Saltings					Extensive sand dune system and other habitats including areas of saltmarsh, shingle, open water and intertidal sands.
Hastings Cliffs					Vegetated sea cliffs of Atlantic and Baltic coasts.
Hastings Cliffs To Pett Beach					Palaeobotanical and vertebrate palaeontological fossils, woodland, scrub, maritime grassland and vegetated shingle.
Pevensey Levels					Rich grazing meadows and ditch systems.
Seaford to Beachy Head					Herb-rich chalk grassland, chalk heath, maritime grassland, foreshore and chalk cliffs, river meanders, and Greensand reef.
Brighton to Newhaven Cliffs					Main interest is geological, although there are some rare plants growing on the cliff face and cliff-top chalk grassland.
Adur Estuary					Saltmarsh, intertidal mudflats, estuarine plant communities.
Felpham					Palaeocene flora, recently discovered in the Reading Beds.
Climping Beach					Vegetated shingle beach, behind which is a sand dune system.
Bognor Reef					Foreshore of geological interest, extensive vegetated shingle habitat, small area of old sand dune.
Pagham Harbour					Saltmarsh, mudflats, lagoons, shingle, open water, reed swamp, wet permanent grassland.
Selsey, East Beach					Contains a sequence of freshwater and estuarine deposits of Ipswichian Interglacial age.

In addition to the designations detailed in Table 2.1, there are nature reserves and wildlife sites within the Natural Area.

3.1.1 Habitats present within the Folkestone to Selsey Bill Natural Area

Table 3.2 provides information on the approximate areas of habitats within the counties of Kent, East Sussex and West Sussex. The JNCC Coastal Directory No. 8 (JNCC, 1998) provides details of the approximate areas of these habitats within the area from Rye Bay to Chichester Harbour, which does not closely coincide with the Natural Area boundary.

Therefore we have included the values for Kent provided in the JNCC Coastal Directory No. 7 (JNCC, 1999) in order to take account of the vegetated shingle habitat at Dungeness. Please note that most of the areas given in Table 2.3 for Kent are outside the Folkestone to Selsey Bill Natural Area.

Table 3.2 Extent of coastal habitats (English Nature, 1998)

Habitat type	Area / Length
Vegetated shingle	3487 ha
Hard cliff	c. 67 km
Unprotected soft cliff	6 km
Sand dune	196 ha
Estuaries	1137 ha
Saltmarsh	104 ha
Grazing marsh	No figure given as most is in adjacent Natural Areas
Lagoons	Less than 30 ha

3.1.2 Additional information for Natural Area 108

Geomorphology

Sediment transport processes are generally described in SMPs in the context of coastal cells, ie the length of coastline within which sediment erosion and accretion are inter-related and which are largely independent of other cells. This Natural Area lies within the coastal cell from the Thames to Selsey Bill, which is then subdivided into two sub-cells; Dover Harbour to Beachy Head and Beachy Head to Selsey Bill (JNCC, 1998). Coastal sub-cells form the basis of the SMPs that define a strategy for coastal management.

Dover Harbour to Beachy Head

The sub-cell from Dover Harbour to Beachy Head exhibits eastward littoral drift. Sand and shingle are transported by south-westerly waves. There are however some localised changes in net drift direction. The eastern side of the Dungeness foreland is just such an example, as the sediment moving eastward is lost offshore at Dungeness and the coastline to the east is experiencing a deficit in the supply of beach material. Erosion is prevalent over most of this sub-cell although there are areas of accretion at the western side of Dungeness and between Eastbourne and Pevensey (JNCC, 1998).

Beachy Head to Selsey Bill

The SMP sub-cell Beachy Head to Selsey Bill also experiences eastward littoral drift of sand and shingle, generated by the predominantly south-westerly winds. Erosion of shingle beaches is predominant over most of this sub-cell whilst localised accretion occurs at the harbour arms. Significant accretion takes place at Pagham Harbour, and at the mouth of the Rivers Cuckmere and Ouse (JNCC, 1998).

Futurecoast study

A recent Defra sponsored study, entitled *Futurecoast* (only available in CD-ROM format from Defra Flood Management Division, London), has investigated the larger-scale coastal behaviour of the open coastline of England and Wales using a geomorphological approach in

order to predict coastal evolution over the next 100 years. *Futurecoast* has explored a new approach to shoreline evolution called the 'behavioural systems' approach. The identification of a behavioural system is an attempt to integrate geomorphological units that are spatially contiguous into a single entity and is therefore not restricted to the coastal cell boundaries used in SMPs (Halcrow, 2002).

For this Natural Area, the *Futurecoast* study identified two coastal behavioural systems; Inner English Channel (Beachy Head to Selsey Bill) and Straits of Dover (North Foreland to Beachy Head). The main geomorphological features of these systems are as described within the SMP coastal cells: eastward sediment transport, with the development of cuspate forelands at the Crumbles and Dungeness (which store a large amount of the shingle within the Eastern English Channel). It is noted that the actual transfer of sediment along this stretch of coastline is considerably less than the potential, due to the relative scarcity of fresh sediment input (as well as the present management intervention).

Geology

The solid geology exposed on the coast between Rye Bay and Chichester Harbour consists of strata of sedimentary rocks of Lower Cretaceous (among the oldest rocks in south-east England) to Palaeogene (Lower Tertiary) age. As the strata dip towards the south-west, the oldest rocks are exposed in the east and the youngest in the west. This configuration forms the southern part of the Wealden anticline and the eastern part of the Hampshire Basin (JNCC, 1998). There are several sites of geological interest throughout this Natural Area.

Coastal defences

Much of the coastline within this Natural Area is protected by coastal defences due to the proximity of urban areas to the sea and the erosional trend along the coast. The main coast protection technique is the construction of a seawall and/or groynes to retain sediment in front of the seawall in order to reduce wave energy. Other methods which have been used within the area include, cliff strengthening at Fairlight Cove, the construction of eight offshore breakwaters at Elmer, beach replenishment at Lancing and Worthing and the construction of rock groynes (JNCC, 1998). Further information on existing coastal defences can be found in the current SMPs.

Coastal Development and Infrastructure

Coastal roads of regional and local importance are found along most of the coastline at various distances from the shore. A railway line is located close to shore along the tract between Hastings and Pevensey. Most frequently, railway lines are located landward of local roads.

Westwards from Brighton, the coast is almost completely built up as far as Littlehampton at a distance of approximately 30 kilometres. Other urban centres include Folkestone, Hastings, Eastbourne, and Bognor Regis. It is predicted that the number of housing units will increase in this area and a significant number of the new units will be established within the existing urban boundaries of Hastings, Eastbourne, Brighton and Hove. A number of smaller towns and villages are also present along this coastline.

Ports and harbours have developed in the estuaries and natural harbours of the region and traditionally have been important for cross-channel trade and fisheries. The main commercial ports and harbours in this area are located at Folkestone, Rye, Hastings, Newhaven, Shoreham, and Littlehampton. The recreational marinas of Brighton and Sovereign Harbour are also located along this stretch of coastline. The Dungeness nuclear power station is located on Dungeness' shingle cuspate foreland and Shoreham power station is also located on the coast.

3.2 Biodiversity targets

The Folkestone to Selsey Bill Natural Area is covered by several Biodiversity Action Plans (BAPs) of national, regional and local scale. These include:

- UK Biodiversity Action Plan;
- Kent Biodiversity Action Plan;
- *From Rio to Sussex - actions for biodiversity* produced by the Sussex Biodiversity Partnership for the area of East and West Sussex and Brighton and Hove; and
- Biodiversity targets for each Natural Area as defined by English Nature.

The intention of setting such BAP targets was to manage the diversity of habitats within the UK to reduce habitat losses and to recognise where habitat increases are required. In order to achieve this, more specific HAPs and SAPs have been developed. It is however generally recognised that the protection of habitats is one of the best methods of protecting species (although there will be some species which need additional protection).

The targets that are presented below are the HAPs set specifically for this Natural Area as part of the UK Biodiversity Strategy. It should be noted that they are estimates and are not definitive. As further survey and monitoring work is undertaken, to determine the status and distribution of habitats, the targets can be subject to amendment (see www.english-nature.org.uk/baps/targets).

3.2.1 Biodiversity targets for habitats of national significance

This section outlines the BAPs for the habitats of national significance within the Natural Area (as identified in Table 2.2).

Coastal and floodplain grazing marsh

- Maintain the extent and quality of existing coastal grazing marsh in Rye Harbour and Dungeness.

Saline lagoons

- Safeguard and maintain current extent of saline lagoon habitat, (subject to natural change).
- Consider opportunities for creating up to 10 hectares of saline lagoon habitat taking into account of national guidance.

- **Specific target:** increase by 10 hectares by 2010.

Maritime cliff and slope

- Seek to maintain the existing maritime cliff resource, by ensuring no further loss to extent or quality of cliff-top semi-natural habitats.
- **Specific target:** maintain 32 kilometres by 2015.
- Ensure that SMPs promote policies which will maintain, wherever possible, free functioning of coastal processes acting on maritime cliff and slope habitats.
- Seek opportunities to increase the extent of eroding cliffs over time, by allowing natural processes of cliff mobility to continue. Consider opportunities of freeing up currently protected cliffs over the next 20 years, taking into account national guidance.
- Increase the area of cliff-top semi-natural habitats by minimum of 15 hectares by 2020.
- **Specific target:** increase by 15 hectares by 2020.
- Improve by appropriate management the quality of at least 30 percent of the maritime cliff and slope habitats, including cliff-top grassland and heath, by 2010, and as much as possible before 2015.
- **Specific target:** restore 10 kilometres by 2015.

Coastal vegetated shingle

- Maintain and protect the existing vegetated shingle structures from Folkestone to Selsey Bill (estimated at 3,500 hectares). Ensure that SMPs promote policies which will allow natural processes for the creation and maintenance of shingle to operate, where practicable, and so sustain the area and quality of this habitat.
- **Specific target:** maintain 3500 hectares by 2015.
- Encourage reinstatement of wetland vegetation on shingle sites (where appropriate), by scrub clearance and grazing.
- Secure appropriate management for all vegetated shingle SSSIs by 2005, achieving favourable condition, wherever feasible, by 2010.
- Prevent, where possible, further exploitation of, or damage to, existing vegetated shingle sites through human activities. Implement visitor management provision, so that disturbance by visitors is at a level where the quality of existing plant, bird and invertebrate communities are not compromised.
- Seek opportunities to improve the condition of vegetated shingle structures and fringing beach habitats that are degraded/damaged and to prevent further deterioration quality by 2010.
- Consider options to allow the partial set back of the existing shingle ridges. Replacement areas for grazing marsh/reedbeds and lagoons creation should be sought elsewhere along the Sussex and Kent coast (link to grazing marsh, lagoon & reedbeds HAPs). There are landscape implications and it is important that public access to rides/banks should be carefully managed so that disturbance is minimised and the value of the area for birds is not reduced.

3.2.2 Biodiversity targets for habitats of local significance

This section outlines the BAPs for the habitats of local significance within the Natural Area (as identified in Table 2.2).

Littoral chalk

- Maintain coastal chalk habitats along the Sussex coast as a viable rocky habitat for characteristic plant and animal communities (subject to natural change). Minimise adverse impacts on littoral/sublittoral chalk habitat, where possible, from construction or replacement of coastal protection works and sea defences.
- **Specific target:** maintain 29 kilometres by 2015.
- Ensure that SMPs promote policies which will allow natural processes for the creation and maintenance of littoral/sublittoral chalk to operate, where practicable, and so sustain the area and quality of this habitat.
- Adopt sustainable management practices for all users on littoral and sublittoral chalk habitats.
- Consider non-replacement of coastal cliff defences which have come to the end of their useful life (so as to increase the extent of littoral chalk habitat unaffected by defence/engineering works). Link to maritime cliff HAPs.

Coastal saltmarsh

- Maintain and safeguard the current extent of coastal saltmarsh between Folkestone to Selsey Bill by adopting sustainable management practices for all uses of intertidal habitats.
- **Specific target:** maintain 100 hectares by 2015.
- Identify opportunities for habitat re-creation to compensate for past losses due to coastal defence works, reclamation etc (30 hectares by 2015).
- **Specific target:** increase by 30 hectares by 2015.

Mudflats

- Maintain and safeguard current extent of intertidal mudflats along the south Kent/Sussex Coasts. Ensure that SMPs promote policies which will allow natural processes for the creation and maintenance of intertidal mudflats to operate, where practicable, and so sustain the area and quality of this habitat. Link to saltmarsh and grazing marsh HAPs.
- **Specific target:** maintain 550 hectares by 2015.
- Consider opportunities for creating new areas of mudflats taking into account national guidance by 2010. Link to saltmarsh and grazing marsh HAP targets.
- **Specific target:** No target specified by 2015.
- Restore estuarine water quality to ensure existing mudflats fulfil their important ecological and conservation importance (aiming to achieve water quality objectives and nutrient standards), by 2010.

Sea grass beds (*Zostera* sp.)

- Investigate reason for local extinction of seagrass beds.
- Assess feasibility of re-establishing seagrass beds (where applicable) (as there is recovery in adjacent Natural Area prepare for possible natural recolonisation).

Coastal sand dunes

- Protect the existing sand dune resource along the south Kent/Sussex Coast from further losses (subject to natural change). Ensure that SMPs promote policies which will allow natural processes for the creation and maintenance of dunes to operate, where practicable, and so sustain the area and quality of this habitat.
- **Specific target:** maintain 196 hectares by 2010.
- Maintain the current extent and distribution of dune grassland currently in favourable condition, by ensuring that they continue to receive appropriate management.
- Improve the condition of 110 hectares of dune grasslands that are degraded by neglect or inappropriate management by 2010.
- **Specific target:** restore 110 hectares by 2010.
- Seek opportunities to re-establish 20 hectares of sand dune habitat lost to agriculture/other human activity and/or expected losses to erosion by 2010.
- **Specific target:** increase by 20 hectares by 2010.

3.2.3 Summary of the main targets

The biodiversity targets outlined in Section 3.1 and 3.2 have similar requirements for each habitat, the main themes are summarised below:

- safeguard and maintain the current extent of habitat;
- consider opportunities to create habitat;
- ensure no further loss of extent or quality of habitat;
- aim to maintain the free functioning of coastal processes;
- improve by appropriate management the quality of habitat;
- reinstate lost habitats where appropriate; and
- manage public access to some habitats (eg vegetated shingle).

3.3 Existing policies

The Folkestone to Selsey Bill Natural Area is covered by two SMPs, the Beachy Head to South Foreland SMP and the South Downs SMP (which covers the area from Beachy Head to Selsey Bill). The current SMP policies for the frontage are listed in Tables 3.3 and 3.4 by coastal unit as presented in the SMP.

Table 3.3 Current SMP policies for the South Downs SMP

Unit No.	Location	Current Policy
1	Selsey Bill	Hold the Line
2	Church Norton to Pagham	Hold the Line
3	Pagham/West Bognor Regis	Do Nothing
4	Bognor Regis to Elmer	Hold the Line
5	Elmer Breakwater	Hold the Line
6	Elmer to Littlehampton Harbour Mouth	Hold the Line
7	Littlehampton	Hold the Line
8A	Littlehampton to Goring on Sea	Hold the Line
8B	Goring on Sea to Lancing	Hold the Line
9A	Lancing to Shoreham Harbour Mouth	Hold the Line
9B	Shoreham Harbour Mouth to Aldrington (W. Hove)	Hold the Line
10	West Hove to Brighton Marina	Hold the Line
11	Brighton Marina	Hold the Line
12	Brighton Marina to Saltdean	Hold the Line
13A	Telscombe	Hold the Line
13B	Peacehaven	Hold the Line
14	Peavehaven Heights to Harbour Heights	Do Nothing
15A	Newhaven Harbour	Hold the Line
15B	Tide Mills to Seaford	Hold the Line
16	Seaford Head	Do Nothing
17	Cuckmere Haven	Hold the Line/Managed Retreat
18A	Cuckmere Haven to Birling Gap	Do Nothing
18B	Birling Gap	Do Nothing
18C	Birling Gap to Beachy Head and Holywell	Do Nothing

Although Pagham Harbour lies within the coastline covered by the South Downs SMP, it is included in the East Solent SMP, which recommended maintaining or upgrading the standard of the existing flood defence throughout the estuary.

As shown in Tables 3.3 and 3.4, the policy for the majority of the coastline in this Natural Area is 'Hold the Line', with areas of undefended coastline covered by the 'Do Nothing' policy. There are some stretches of coastline where the policy is to 'Hold the Line' but with the option to undertake 'Managed Realignment' in certain locations in the future.

Table 3.4 Current SMP policies for the Beachy Head to South Foreland SMP

Unit No.	Location	Current Policy
1	Eastbourne West	Hold the Line
2	Eastbourne East	Hold the Line/Managed Retreat
3	Pevensey Bay	Hold the Line
4	Norman's Bay	Hold the Line
5	Bexhill West	Hold the Line
6	Bexhill East	Hold the Line
7	Hastings West	Hold the Line
8	Hastings East	Hold the Line
9	Hastings Cliffs to Fairlight Cove	Do Nothing
10	Fairlight Cove	Hold the Line
11	Fairlight Cove to Cliff End	Do Nothing
12	Cliff End to Winchelsea Beach	Hold the Line
13	Rye Harbour West	Hold the Line
14	Rye Harbour East to Camber Sands	Hold the Line
15	Lydd Ranges	Hold the Line
16	Dungeness Power Station	Hold the Line

Unit No.	Location	Current Policy
17	Dungeness to Littlestone on Sea	Do Nothing
18	Littlestone on Sea to Hythe Ranges	Hold the Line
19	Hythe Ranges	Hold the Line
20	Hythe to Folkestone Harbour	Hold the Line
21	Copt Point	Do Nothing
22	Folkestone Warren	Hold the Line

Following on from the SMP documents there has been the production of coastal strategies for some parts of the Natural Area. These strategies have investigated the SMP policies in more detail and have often made further recommendations. The coastal strategies have not been thoroughly analysed within this report but references to these strategies are made as and when these have been mentioned at the workshop. A summary of the status of the coastal defence strategies within this Natural Area are provided in Table 3.5, this has been compiled through discussions with DEFRA.

Table 3.5 Status of coastal defence strategies

Coastal Defence Strategy	Status
Folkestone to Rye	Completed, not approved
Beachy Head to Rye	Approved
Saltdean to Newhaven	Completed, not approved
Brighton Marina to Saltdean	Approved
Adur to Brighton Marina	Approved
River Arun to River Adur	Approved
River Arun to Pagham	Approved
Pagham to East Head	On hold

The following section presents the biodiversity opportunities identified during the workshop and briefly suggests changes to the current SMP policies for consideration in the SMP review process and in future strategies.

3.4 Environmental enhancement opportunities

This section presents the biodiversity opportunities that have been identified by members of conservation organisations and local authorities at the workshop. This section concentrates on those opportunities that require changes to the existing SMP policy to be undertaken.

In addition to identifying biodiversity opportunities, this section also highlights the potential habitat gains and losses relative to the BAP (national and local) targets and the potential issues where these have been identified during the workshop. However, detailed investigations have not been undertaken to assess the amendment of the current preferred defence policy as this work must be undertaken by the operating authority and the appointed group for reviewing and implementing the SMP.

3.4.1 Folkestone Warren – Unit 22 of Beachy Head to South Foreland SMP

Current SMP Policy: Hold the Line

The preferred policy for Unit 22 is to 'Hold the Line', however, opportunities have also been highlighted for managed realignment in the event of decommissioning the railway. Folkestone Warren is largely undeveloped along the cliff top with the exception of Capel-le-

Ferne, which lies close to the cliff edge and includes road structures and caravan parks. The railway infrastructure has long been subject to disastrous slippages. Folkestone Warren is an important geological and ecological site and could be improved by the removal of the redundant sea defences.

Suggested SMP Policy: Managed Realignment

BAP Gains:	The long term vision is for maritime cliff habitats subject to dynamic coastal processes
Coastal adaptation:	None identified
Considerations:	Railway line, level of defence of Capel le Ferne

3.4.2 Romney Warren – Unit 18 of Beachy Head to South Foreland SMP

Current SMP Policy: Hold the Line

The preferred policy for Unit 18 is to 'Hold the Line', however, it also recommends that long term opportunities for retreating the line are also considered.

Suggested SMP Policy: Managed Realignment

BAP Gains:	The long term vision is for sand dune habitat subject to dynamic coastal processes
Coastal adaptation:	None identified
Considerations:	Installation of secondary defence issues, remodelling of drainage outfalls and consideration of the coastal road

3.4.3 Lydd/Dungeness – Units 15 and 17 of Beachy Head to South Foreland SMP

Current SMP Policy: No Active Intervention

The workshop highlighted that there are potential biodiversity opportunities along the Dungeness foreland and the adjacent coastline. The Dungeness to Pett Levels Coastal Habitat Management Plan (Posford Haskoning, 2002) has investigated the options to manage the coastal frontage in this area, which currently requires a considerable amount of beach recharge work to transport shingle from the west in order to combat erosion. This beach management is impacting detrimentally on vegetated shingle habitats in the area.

The Dungeness CHaMP put forward four management options, which were:

1. do nothing;
2. hold the line;
3. managed realignment: removal of the rye harbour terminal groyne; and
4. managed Realignment: retreat to 1800 coastline.

The implications of each of these options on existing and future habitats have been discussed in detail in the CHaMP and are only summarised as follows (Cottle, 2002). Apart from Option 2 (Hold the Line), all the other options would lead to some loss of freshwater habitats (for example, the SPA/Ramsar sites at Pett Levels and Walland Marsh) and would impact on localised areas of vegetated shingle (although they should have a net benefit for this habitat).

There would however be gains in terms of intertidal habitat and the creation of a more sustainable coastal system.

The 'Hold the Line' policy currently prevents the natural colonisation of perennial shingle habitat at the extraction sites for shingle recycling. The re-profiling that takes place at the deposition area also causes damage to the annual vegetation of drift lines. The shingle banks that are built up do however protect the landward Ramsar interests of Pett Levels and Walland Marsh. The long-term sustainability of this option will need to be considered.

Any realignment work of the Rye harbour terminal groyne would result in blockage of the Rye Harbour navigation channel with shingle and potential flooding of villages such as Winchelsea Beach due to the failure of the existing shingle ridges and embankments. Retreating to the 1800 coastline would have major consequences on the Dungeness Power Station, which would hopefully be decommissioned before being threatened. There are therefore several important infrastructure issues associated with any potential realignment works, which will need careful consideration in the future. As a defence policy, which enables the sustainable functioning of the coastline, it is suggested that the policy option of Managed Realignment be further investigated.

Suggested SMP Policy: Managed Realignment

BAP gains:	Intertidal habitats, vegetated shingle habitat
Coastal adaptation:	Loss of freshwater habitats, vegetated shingle habitat in places
Considerations:	Impact on infrastructure, ecological interest and sustainability

3.4.4 Rye/Camber Sands – Units 13 and 14 of Beachy Head to South Foreland SMP

Current SMP Policy: Hold the Line

The area from Winchelsea Beach to Rye Harbour is dominated by recent storm ridge deposition over the Holocene and Quaternary sand and silts. This has meant that there has been progressive aggradation of the shoreline since the 16th Century. More recently, the Rye harbour arm has interrupted the easterly longshore drift, and the processes of shoreline advance have slowed down or stopped. The undeveloped accreting shoreline is of high conservation value for shingle, dune, brackish and freshwater habitats. However, if managed realignment is undertaken along this frontage, saline habitats such as saline lagoon and saltmarsh could be created.

At the workshop, several biodiversity opportunities were identified for this area, however, in order to undertake them, there would be a requirement to reconsider the existing structures and geomorphological processes that operate around Rye Harbour. This area is also inter-related with the Dungeness frontage discussed in Section 5.3.

The coastline to the east of Rye Harbour is predominantly undefended with sand dunes present at Camber Sands. There may be an opportunity to restore the dynamic functioning of the areas of relict sand dunes by management of the golf course on the eastern bank of the River Rother. The potential for realignment along the upstream reaches of the River Rother between Monkbretton Bridge and Scots Float was also identified during the workshop. In the long term, it may be desirable to investigate the impacts of the partial removal of the Rye Harbour arm. It is anticipated that shingle would then obstruct the harbour entrance and

deposit on the sands at Camber. This would also have implications for the Dungeness coastline and, as discussed in Section 5.3, has been investigated in the Dungeness to Pett Levels CHaMP. Further investigation building on the CHaMP recommendations is likely to be needed in the future.

Suggested SMP Policy: Managed Realignment

BAP Gains:	Saltmarsh, more functional dune system, lagoons, reedbeds
Coastal adaptation:	Freshwater habitats
Considerations:	Impacts on designated sites

3.4.5 Pett Levels – Unit 12 of Beachy Head to South Foreland SMP

Current SMP Policy: Hold the Line

The low-lying, largely undeveloped land in this area provides an opportunity to undertake managed realignment over the Pett Levels to create intertidal habitat, however the area is designated as a freshwater SSSI, SPA and Ramsar site. It is therefore important to evaluate the sustainability of these habitats in this location, and the consequential requirement to 'Hold the Line', or to undertake managed realignment.

Section 5.3 has already detailed (based on the CHaMP findings) the effect that managed realignment along the Lydd/Dungeness frontage would have on the Pett Levels. It is principally expected to lead to a loss of freshwater habitat and a gain in brackish habitat.

Suggested SMP Policy: Managed Realignment

BAP Gains:	Intertidal habitats
Coastal adaptation:	Loss of freshwater habitats
Considerations:	Existing conservation designations

3.4.6 Pevensey Levels – Unit 3 of Beachy Head to South Foreland SMP

Current SMP Policy: Hold the Line

There is the potential to undertake large scale managed realignment over the Pevensey Levels to create intertidal habitat, however, the area is currently designated as a freshwater Ramsar site. As for Section 5.5, it is therefore important to evaluate the sustainability of these habitats in this location, and the consequential requirement to Hold the Line, or Managed Realignment. The SMP concludes that to realign the line would initiate erosion but would not provide an input to the longshore sediment budget.

Suggested SMP Policy: Managed Realignment

BAP gains:	Intertidal habitat, more sustainable management of the shingle bank
Coastal adaptation:	Loss of freshwater Ramsar site
Considerations:	Ramsar site, railway line, houses

3.4.7 Crumbles – Unit 2 of Beachy Head to South Foreland SMP

Current SMP Policy: **Hold the Line**

The Crumbles area has recently experienced rapid urban expansion and the development of a marina. The Beachy Head to South Foreland SMP recommended 'Hold the Line' as the preferred option for Unit 2 however it also suggested that opportunities for future realignment should be considered. The workshop highlighted that although the recent development conflicts with the policies of sustainable coastal zone management there may be the potential to restore vegetated shingle habitats and saline lagoon habitats.

Suggested SMP Policy: **Managed Realignment**

BAP gains:	The long term vision is for the restoration of vegetated shingle habitats and creation of saline lagoons (subject to dynamic coastal processes)
Coastal adaptation:	None identified
Considerations:	Existing development

3.4.8 River Cuckmere – Unit 17 of South Downs SMP

Current SMP Policy: **Hold the Line and Managed Realignment**

The SMP recommends that in the short term the policy of Hold the Line is used for this unit, in order to maintain the current status of the river mouth. However, in the medium and long term Managed Realignment should be actively explored.

It is noted that the Environment Agency have initiated the Cuckmere Estuary Restoration Project to investigate the opportunities to undertake managed realignment within the Cuckmere Valley. The aims of the project are described in the project's information leaflet 'Back to Nature' and include:

- reinstating flow through the meanders;
- restoring the surrounding floodplain, thus creating intertidal habitats like saltmarsh and mudflats;
- increasing the flow of water through the mouth of the river, creating a self-cleansing system;
- removing the training walls from the mouth of the river; and
- filling in the straight cut that currently isolates the meanders.

Suggested SMP Policy: **Hold the Line and Managed Realignment**

BAP gains:	Vegetated shingle, intertidal habitats including saltmarsh
Coastal adaptation:	Freshwater habitats, saline lagoons
Considerations:	Landowner issues

3.4.9 River Ouse – Unit 15A of South Downs SMP

Current SMP Policy: **Hold the Line for the open coast**

The upstream reaches of the River Ouse are not included within the South Downs SMP, however, it is still important to note that there is potential along the Ouse Valley to undertake intertidal habitat creation. It is understood that the Environment Agency are undertaking investigations into the feasibility of using this area as flood storage for Lewes.

Suggested Policy: **Managed Realignment upstream**

BAP Gains:	Intertidal habitat, reedbeds, freshwater habitats, vegetated shingle, saline lagoons
Coastal adaptation:	Grazing marsh habitat
Considerations:	Local Nature Reserve, maintaining flood defence of Newhaven

3.4.10 Telscombe – Unit 13A of South Downs SMP

Current SMP Policy: **Hold the Line**

The current SMP policy recommends Hold the Line for this stretch of coast which includes a 1685 m chalk cliff frontage. Telscombe Cliffs are located within this unit and are designated as SSSI for geological reasons, therefore a policy of Hold the Line is anticipated to be damaging to the interest of the SSSI. In order to conserve the geological importance of the cliffs it is recommended that coastal processes including erosion are allowed to continue. Further investigations are required to assess the feasibility of a policy of limited intervention or no active intervention for the designated cliffs.

Suggested SMP Policy: **No Active Intervention**

BAP Gains:	Allow dynamic coastal processes to be reinstated on maritime cliff habitats
Coastal adaptation:	None identified
Considerations:	Assets at risk

3.4.11 Brighton Marina to Telscombe – Unit 12 of South Downs SMP

Current SMP Policy: **Hold the Line**

Coast defence works to increase the protection to the cliff frontage from Brighton Marina to Ovingdean have been approved by DEFRA and will be undertaken during 2003. The works will include improvements to the seawall and the construction of a rock revetment. These works will not contribute to the BAP targets for maritime cliffs and slopes which suggest that opportunities are sought to increase the extent of eroding cliffs over time, by allowing dynamic processes of cliff mobility to continue. It is suggested within the BAP that these opportunities should be sought over the next 20 years.

As the lifetime of the forthcoming works are predicted to be in excess of 50 years, it is unlikely that this stretch of cliff face can contribute to meeting the BAP target in the short term. However, the opportunity remains to reduce the level of protection provided by the existing defences in the longer term in order to allow processes of erosion to return. In the shorter term, the opportunity could be sought to provide artificial ledges for nesting birds.

Suggested SMP Policy: **Managed Realignment**

BAP gains:	The long term vision is to reduce the loss of the wave cut platform, which is currently taking place due to coastal squeeze
Coastal adaptation:	None identified
Considerations:	Forthcoming coast defence works, A259, urban development and interceptor sewer

3.4.12 River Adur – Unit 9A of South Downs SMP

Current SMP Policy: **Hold the Line for the open coast**

As for the River Ouse (Section 5.9), the upstream reaches of the River Adur are not included within the South Downs SMP. It is still important to note that there is potential to realign the river embankments to create saline habitats. Realignment in this area could be achievable as the Adur floodplain currently has very little development. Investigation of these opportunities is currently being investigated by the South Downs Conservation Board and the Environment Agency.

Suggested Policy: **Managed Realignment upstream**

BAP gains:	Saltmarsh, reedbeds
Coastal adaptation:	None identified
Consideration:	Potential conflict with archaeological interests and the airport

River Arun – Between Units 6 and 7 of South Downs SMP

Current SMP Policy: **Hold the Line for the open coast**

At the workshop, the potential to realign the embankments of the River Arun over the adjacent agricultural land to create saline habitat was identified with the intention to create saltmarsh and reed beds. The embankments along the upstream reaches of the River Arun were not directly included in the South Downs SMP. It will therefore be necessary to consult the appropriate management plans for the River Arun, including the Arun Valley Management Plan and the River Arun and West Sussex Catchment Flood Management Plan, to assess their policies. It should be noted that the River Arun to Pagham Coastal Defence Strategy has already identified that the preferred policy option between Poole Place and Atherington is Managed Realignment.

Suggested Policy: **Managed Realignment upstream**

BAP gains:	Saltmarsh, reedbeds
Coastal adaptation:	Agricultural land
Considerations:	Tidal embankments still in good condition

3.4.13 Elmer to Littlehampton Harbour Mouth – Unit 6 of South Downs SMP

Current SMP Policy: **Hold the Line**

The SMP policy is currently 'Hold the Line' in order to secure the flood zone, but it also states that there is the opportunity "for minor managed realignment of the existing storm ridge and dune system so as to accommodate natural trends, whilst continuing to prevent a breach". Climping Beach is designated as a SSSI for its vegetated shingle and sand dune system. Suggestions from the workshop indicated that the shingle recycling could be stopped and that realignment could take place west and east of Atherington. The River Arun to Pagham Coastal Defence Strategy concluded that managed realignment is the preferred option for the area between Poole Place and Atherington.

Suggested SMP Policy: **Managed Realignment**

BAP gains:	Improved vegetated shingle and sand dune system
Coastal adaptation:	None identified
Considerations:	Agreement between land owner and Environment Agency

3.4.14 Pagham Harbour - Units 2 and 3 of South Downs SMP and East Solent SMP

Current SMP Policy: **Hold the Line**

Most of the area surrounding Pagham Harbour is low lying and includes large areas of floodable land to the north and the southwest. The margins of the harbour are mainly farmland, but also include a large holiday development and a small residential area (East Solent SMP). The SMP recommends a policy of 'Hold the Line' for Pagham Harbour as it states that undertaking managed realignment would not be economically justified despite having environmental gains.

There are a variety of biodiversity opportunities within Pagham Harbour which could lead to a more functionally sustainable harbour. These opportunities include undertaking managed realignment in the inner harbour to create saltmarsh habitat, through the possible realignment of the north wall inner sea defence. In addition to this, realignment of the shingle spits at the harbour mouth could produce a more natural and sustainable coastline. Preliminary studies have recommended the modest landward realignment of the southern spit with the aim of reducing the level of intervention required to maintain it. For the Medmerry frontage a landward realignment of the shingle bank has also been suggested for similar reasons as stated for the mouth of Pagham Harbour. There is potential (in the long term future) to interlink Pagham Harbour and Medmerry, however this would require major infrastructure alterations, as the only road to Selsey forms an embankment between the Medmerry and Pagham Harbour areas. Opportunities could also be sought to free up the 'trapped' relic sand dune system to the north-east of the harbour and to improve the condition of the saline lagoon/reedbed habitat to the south of the harbour mouth (currently a privately owned SSSI outside the Local Nature Reserve (LNR) boundary).

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Intertidal mudflats, including saltmarsh, improvement to sand dune system, more sustainable system.
Coastal adaptation:	Saline lagoon habitats, freshwater habitats, waterfowl feeding areas, water vole habitat
Considerations:	The East Solent SMP concluded that there would be little economic benefit from undertaking managed realignment with Pagham Harbour

3.5 Findings

The environmental enhancement opportunities that have been identified during the workshop and that are recorded in this report would contribute to the achievement of some of the national and local biodiversity targets for the following habitats:

- intertidal habitats;
- saltmarshes;
- vegetated shingle;
- sand dune system;
- freshwater habitats; and
- saline lagoons.

With the exclusion of sea grass beds, littoral chalk and associated species, these opportunities go towards meeting all of the national and local targets. However, more detailed studies would have to be undertaken to recognise the extent and quality of habitat that could be gained in order to confirm the extent to which the opportunities satisfy the specific targets. The South-East Regional Strategic Monitoring Programme should help to find information in this regard.

In order to undertake the biodiversity opportunities identified at the workshop and discussed in this document, changes to the current SMP policies are suggested. This report is intended to provide alternative coastal defence policies to those currently recommended in the SMP. However, some of the suggested policies have already been considered by coastal strategies produced following the SMP and others have been discussed in the Dungeness to Pett Levels CHaMP (Cottle, 2002). For those that have not yet been investigated in detail, further studies would be required to assess their feasibility in relation to the identified issues. Table 6.1 summarises those biodiversity opportunities identified upstream of the SMP unit boundaries.

Table 6.1 Biodiversity opportunities outside the SMP boundaries

SMP unit no.	**Current SMP policy on the open coast**	**Suggested policy Inland**
Units 13 and 14 of Beachy Head to South Foreland SMP	Hold the Line	Managed Realignment upstream
Unit 15A of the South Downs SMP	Hold the Line	Managed Realignment upstream
Unit 9A South Downs SMP	Hold the Line for the open coast	Managed Realignment upstream

3.6 References

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4. Biodiversity opportunities within the Solent and Poole Bay Natural Area 109

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4.1 Description of the Natural Area

4.1.1 General description

The Solent and Poole Bay Natural Area covers the stretch of coast from Selsey Bill in the east to Studland Cliffs in the west and comprises areas of national and international importance for wildlife and geological conservation alongside heavy industrial, commercial, recreation and urban settlements. This area includes maritime, open sea and seabed habitats; in particular, it presents some very important natural and undisturbed lengths of coast, with unusual examples of natural transitions from marine to coastal and terrestrial habitats. Among its major features are the large, shallow harbours of Poole, Christchurch, Portsmouth, Langstone, Chichester and Newtown on the Isle of Wight. In addition, the Solent is one of a very few major sheltered channel systems found in Europe.

A brief description of the geology, habitats and wildlife present within this Natural Area has been provided by English Nature (English Nature, 1998) and this includes the following:

- coastal forms and the landforms they create are significant in this Natural Area. Several nationally important features are present such as Poole Harbour, Hurst Spit and the Needles on the Isle of Wight, which is itself indented by numerous bays, estuaries and harbours. Terrace gravels from the River Solent are exposed at Lee on the Solent, Bracklesham Bay and Selsey. These gravels contain important fossils and Paleolithic artefacts;
- estuaries, harbours, saltmarsh and grazing land which support terns, seabirds and a wide range of breeding and wintering wildfowl and waders. Brent geese are characteristic of the estuaries and the Solent. Cord grass and eelgrass beds are present in the intertidal areas. Divided sedge and sea lavender are characteristic plants;
- saltmarsh habitat is found in Chichester and Poole harbours, the west side of Southampton Water, Beaulieu River and the Solent from Lymnington River to Keyhaven. Southampton water is a key saltmarsh site where the hybrid *Spartina angliga* (common cord grass) originated from the native *Spartina maritima* and the north American *S. alterniflora*. This is the only site where the three species are found together;
- lagoons support species such as lagoon and sand worm, lagoon shrimp, spiral tassel weed, starlet sea anemone and lagoon cockle;
- rocky shores and sub-littoral reefs are important habitats for marine algae and a range of marine invertebrates including sea anemones and sponges;
- sea cliffs provide habitat for a very wide range of invertebrates such as bees, wasps, hoverflies and butterflies. The rare Glanville fritillary is found on the south coast of the Isle of Wight. Reptiles are also found as well as important populations of sea birds and cliff algae. Some of the sea cliffs present good geological exposures and are of national significance. Cliff habitat is nationally important for rare and scarce plant

species such as hoary stock which is found on the south coast of the Isle of Wight. In particular, the area between the Needles to St. Catherine's Point is considered of national importance for its botanical interest;

- vegetated shingle and sand dunes support species such as sea kale, yellow horned poppy, breeding terns, grayling butterfly, molluscs, autumn squill, green flowered helleborine, a range of lichens, rare reptiles and amphibians; and
- sub-littoral sand and coarse shell and gravel beds support mantis shrimps, swimming crabs, cuttlefish and oysters amongst the eel grass beds. Maerl beds can also be found on the sublittoral sand banks.

4.1.2 Habitats present within the Solent and Poole Bay Natural Area

English Nature profile of the Natural Area provides details of the approximate areas of some of these habitats as detailed in Table 4.1 (English Nature, 1998).

Table 4.1 Areas in hectares

Habitat type	Total
Coastal vegetated shingle	97+
Vegetated dunes resources	352
Estuaries	17,690
Saltmarsh	4,324
Hard cliffs	1+

The coastline within this Natural Area contains a considerable amount of ecological and geological designations of national and international importance. The international designations are summarised in Table 4.2.

Table 4.2 International nature conservation designations

Site Name	Ramsar	SPA	cSAC	Principle Interest
Chichester and Langstone Harbours				Wetland
Portsmouth Harbour				Wetland
Solent and Isle of Wight Maritime				Atlantic salt meadows, vegetated sea cliffs, estuaries, reefs, *Spatina* swards
Solent and Southampton Waters				Wetland. It regularly supports at least 20,000 waterfowl. The site qualifies under articles 4.1 and 4.2 of the Birds Directive (79/409/EEC)
Solent and Isle of Wight Lagoons				Lagoon
South Wight Maritime				Reefs, vegetated sea cliffs, submerged and partially submerged sea caves
Avon Valley				Wetland. It regularly supports at least 1% of all the individuals in a waterfowl population The site qualifies under articles 4.1 and 4.2 of the Birds Directive (79/409/EEC)
Poole Harbour				Saltmarshes and mudflats
Dorset Heaths (Purbeck and Wareham) and Studland Dunes				Embryonic shifting dunes, shifting dunes along the shoreline, Atlantic decalcified fixed dunes, and European dry heaths
Isle of Portland to Studland Cliffs				Vegetated sea cliffs and Semi-natural dry grassland

In addition to the international designations detailed in Table 2.3, there are sites and nature reserves of national importance within the Natural Area as listed below.

4.1.3 Additional information for Natural Area 109

Geology

The solid geology of this Natural Area is formed of Mesozoic and Tertiary sedimentary rocks. In Hampshire, around the Solent and as far west as Poole Bay, the solid geology comprises Palaeogene (early Tertiary) strata, which form part of the Hampshire Basin. These strata extend northwards from the Purbeck - Isle of Wight monocline. Between Christchurch and Milford-on-Sea the cliff section comprises gently dipping Palaeogene sands resting on Barton Clay. Palaeogene sections are found in the cliffs at Hengistbury Head and Bournemouth.

The Isle of Wight presents the most spectacular sections of the Palaeogene rocks. At Whitecliff Bay and at Alum Bay, sections show the vertical strata involved in the monocline which forms the striped cliffs. In the northern part of the island the younger Osborne Beds, Bembridge Marls and Hamstead Beds form low cliffs prone to landslipping. The spine of the island is formed of steeply-inclined to vertical chalk, which, on the east coast, forms Culver Cliff and, on the west, the sharp headland of The Needles, with its chain of sea stacks. Immediately to the south of the monocline the Wealden beds have a broad anticlinal outcrop. The fossiliferous strata on the south-west coast of the island between Hanover Point and St. Catherine's Point form the richest Lower Cretaceous dinosaur site in Britain. These strata are succeeded in the southern part of the island by the Cretaceous sequence of Gault Clay, Upper Greensand and Chalk, with a gentle southerly dip. The cliffs of these Cretaceous formations around the southern part of the island are extensively landslipped through failure of the Gault Clay: particularly good examples are to be found between St. Catherine's Point and Ventnor.

The coastline of the Isle of Purbeck presents part of the Upper Jurassic and Cretaceous succession. The embayments of Studland, Swanage and Durlston are cut respectively in relatively soft Palaeogene, Wealden and Purbeck strata constrained by headlands of Chalk, Upper Purbeck Limestone and Portland Stone.

Geomorphology

The *Futurecoast* study (Halcrow, 2002) has recently investigated the larger-scale coastal behaviour of the open coastline of England and Wales using a geomorphological approach in order to predict coastal evolution over the next 100 years. This study has explored a new approach to shoreline evolution called the 'behavioural systems' approach. The identification of a behavioural system is an attempt to integrate geomorphological units that are spatially contiguous into a single entity and is therefore not restricted to the coastal cell boundaries, which have been utilised for the existing SMP.

For this Natural Area, the *Futurecoast* study (Halcrow, 2002) identifies the English Channel and Solent (Selsey Bill to Durlston, including Isle of Wight) coastal behavioural system. This system is characterised by the complex hydrodynamic regime set up by the Isle of Wight. In this area, both tidal currents and waves are dominant upon sediment movements and a number of 'cells' are established. The tidal stream to the east is influenced by the headland of Selsey Bill, whilst Christchurch Bay and Hurst Spit are influenced by the ebb

flow from the Solent. The hydrodynamic regime produces a double high water within the Solent, which results in a corresponding long stand of high water within Poole and Christchurch Bays (Defra, 2002).

Sediment transport - Solent

Sediment transport is described within the context of coastal cells and sub-cells. These divide the coastline into sections within which sediment erosion and accretion are inter-related and largely independent of other cells. In this Natural Area, there is one coastal cell that goes from Selsey Bill to Portland Bill (JNCC, 1998).

From Chichester Harbour to Portsmouth Harbour there is a moderate westward drift, which in recent years has been reduced by coast protection schemes. The drift is also intercepted by harbour mouths, from where beach material is transported offshore by strong ebb tides to form tidal deltas.

From Gosport to Southampton the littoral drift is low and there is a drift divide sited approximately between the mouths of the rivers Meon and Hamble. Tidal currents generally run parallel to the shore and prevent any significant onshore deposition of beach material. Between Southampton to Hurst Spit the littoral drift is low and towards the east on the north shore of the West Solent. There is no discernible drift on the west shore of Southampton Water. Tidal processes dominate in areas protected by mudflats.

There is moderate to high easterly drift of sand and shingle in Christchurch and Poole Bays, and little net drift in Swanage Bay. There is local drift reversal at the entrance to Poole Harbour. Tidal currents carry sand eastwards around Hengistbury Head, some of this being transported offshore and some reaching the coast in Christchurch Bay. Rapid tidal currents transport shingle from the end of Hurst Spit onto offshore banks.

Sediment transport - Isle of Wight

In the Isle of Wight there is low northward and eastward drift from Totland to Cowes, decreasing eastwards from Cowes to Ryde. From Foreland to Ryde there is moderate northward drift. The dominant processes are wave action on the west and east coasts, and combined wave and tidal currents on the north coast. In the southern section of the Isle of Wight, there is moderate to high eastward drift from the Needles to St. Catherine's Point, reducing slightly to the east. In Sandown Bay the drift is moderate and northerly (JNCC, 1998).

Coastal development

Within the Natural Area of Solent and Poole Bay there are many urban settlements. The main towns along this coast are Portsmouth, Southsea, Gosport, Southampton, Bournemouth and Poole. A number of smaller towns are also found, the majority of which are coastal resorts with a population that rises markedly in the summer months. On the Isle of Wight, the main coastal resorts are at Ryde, Sandown, Shanklin, Ventnor, Freshwater, Totland and Yarmouth.

There are many areas of coastal industrial infrastructure, most of which are closely related to port and harbour activities. In particular, Southampton Water is one of the most developed

estuaries in southern England, with a high proportion of the shore dominated by urban area industry and port facilities. Important industries around Southampton include the oil refinery at Fawley (which has been operational to some degree since 1921), associated petrochemical industries, several chemical works and the nearby power station. Portsmouth and Gosport are the main bases for the Royal Navy in the UK and the bases, naval docks and related industries dominate Portsmouth Harbour, on either side of the harbour mouth. A number of smaller harbours used for recreation and fishing crafts are found at Chichester Harbour and Langstone Harbour. Boatyards are also found in the Solent and they serve the recreational, commercial and military industries.

Pressures on the coastal environment

The following are identified as factors requiring attention in the delivery of effective coastal management:

- development pressure through land claim;
- navigation dredging;
- landfill sites on eroding shorelines;
- recreational pressures on coastal habitats;
- grazing pressure on coastal habitats;
- water quality from non-point sources (e.g. agricultural runoff) and point sources;

4.2 Biodiversity targets

The Solent and Poole Natural Area is covered by several Biodiversity Action Plans (BAPs) of national, regional and local scale. These include:

- UK Biodiversity Action Plan;
- Isle of Wight Biodiversity Action Plan;
- Biodiversity Action Plan for Hampshire;
- Dorset Biodiversity Initiative; and
- National BAP targets per English Nature Natural Area.

The intention of setting such BAP targets was to manage the diversity of habitats within the UK to reduce habitat losses and to recognise where habitat increases are required. In order to achieve this, more specific HAPs and SAPs have been developed. It is however generally recognised that the protection of habitats is one of the best methods of protecting species (although there will be some species which need additional protection).

The HAP targets that are presented below are set specifically for this Natural Area However, it should be noted that as further survey and monitoring work is undertaken to determine the status and distribution of habitats, therefore the targets set for the Natural Area can be subject to amendment (see www.english-nature.org.uk/baps/targets).

4.2.1 Natural Area biodiversity targets

The targets below are for the Solent and Poole Bay Natural Area.

Reedbeds

- ∉ Maintain and rehabilitate where necessary, wet reedbed at Keysworth (18 hectares), Wareham-Piddle (3 hectares), East Keysworth/West Holton (10 hectares), East Holton (40 hectares), Wych Farm (5 hectares), and Brownsea Island (9 hectares), Hartland Moor (8 hectares) and Christchurch Harbour (10 hectares) by 2005.
- ∉ **Specific target:** restore 103 hectares by 2005.
- ∉ Maintain and rehabilitate where necessary, wet reedbed at Poole Harbour at Slepe Moor (9 hectares), Saltern's Marsh (10 hectares) and The Moors (11 hectares) at Arne, Swineham Point (10 hectares), by 2005.
- ∉ **Specific target:** restore 40 hectares by 2005.

Coastal and floodplain grazing marsh

- ∉ Maintain the extent and quality of existing coastal grazing marsh habitat, contributing to the development of a baseline.
- ∉ Plan to accommodate the restoration of between 50 to 100 hectares of existing grazing marsh which is in an unfavourable condition over the next 10 years.
- ∉ **Specific target:** restore 50 hectares by 2010.
- ∉ Consider conservation management and re-creation of 50 to 75 hectares of grazing marsh to offset losses in freshwater habitats along the south coast. Aim to complete half this area by 2010 and all by 2015.
- ∉ **Specific target:** increase by 50 hectares by 2010.

Coastal saltmarsh

- ∉ Maintain and safeguard the current extent of coastal saltmarsh by adopting sustainable management practices for all uses of intertidal habitats.
- ∉ **Specific target:** maintain 4300 hectares by 2015.
- ∉ Re-create a minimum of 200 hectares of new saltmarsh by 2015, to offset current losses due to coastal squeeze and erosion, taking into account national guidance. Link to grazing marsh and mudflat HAPs.
- ∉ **Specific target:** increase by 200 hectares by 2015.
- ∉ Maintain the quality of the existing resource in terms of community and species diversity and, where necessary, restore the nature conservation interest through appropriate management. It will be desirable for some managed realignment sites to develop the full range of saltmarsh zonation, by 2015.

Mudflats

- ∉ Maintain and safeguard current extent of intertidal. Ensure that SMPs promote policies which will allow natural processes for the creation and maintenance of intertidal mudflats to operate, where practicable, and so sustain the area and quality of this habitat. Link to saltmarsh and grazing marsh Habitat Action Plans.
- ∉ **Specific target:** maintain 7300 hectares by 2015.

- Increase the estuary area creating new areas of mudflats taking into account national guidance (600 hectares) by 2015. Promote the managed retreat option to provide new areas of intertidal habitat, (in particular mudfalts and saltmarsh) which will be of value to birds. Link to saltmarsh and grazing marsh Habitat Action Plans targets.
- **Specific target:** increase by 600 hectares by 2015.
- Restore estuarine water quality to ensure existing mudflats fulfil their ecological and conservation importance, (aiming to achieve water quality objectives and nutrient standards), by 2010.

Maritime cliff and slopes

- Seek to maintain the existing maritime cliff resource along the south Hampshire/Dorset Coast, by ensuring no further loss to extent or quality of cliff-top semi-natural habitats.
- **Specific target:** maintain 14.7 kilometres by 2015.
- Ensure that SMPs promote policies which will maintain, wherever possible, free functioning of coastal processes acting on maritime cliff and slope habitats.
- Seek opportunities to increase the extent of eroding cliffs over time, by allowing natural processes of cliff mobility to continue. Consider opportunities of freeing up currently protected cliffs over the next 20 years, taking into account national guidance.
- Increase the area of cliff-top semi-natural habitats by minimum of 5 - 10 hectares by 2020.
- **Specific target:** increase by 5 hectares by 2020.
- Improve by appropriate management the quality of at least 30% of the maritime cliff and slope habitats, including cliff-top grassland and heath, by 2010, and as much as possible before 2015.
- **Specific target:** restore 4.4 kilometres by 2015.

Coastal vegetated shingle

- Maintain and protect the existing vegetated shingle structures along the Solent/Poole Bay frontage and on the Isle of Wight (estimated at 100 hectares). Ensure that shoreline management plans promote policies which will allow natural processes for the creation and maintenance of shingle to operate, where practicable, and so sustain the area and quality of this habitat.
- **Specific target:** maintain 100 hectares by 2015.
- Secure appropriate management for all vegetated shingle SSSIs by 2005, achieving favourable condition, wherever feasible, by 2010.
- Prevent, where possible, further exploitation of, or damage to, existing vegetated shingle sites through human activities. Implement visitor management provision, so that disturbance by visitors is at a level where the quality of existing plant, bird and invertebrate communities are not compromised.

- Seek opportunities to improve the condition of vegetated shingle structures and fringing beach habitats that are degraded/ damaged and to prevent further deterioration of quality by 2010.
- Consider options to allow the partial set back of the existing shingle ridges. Replacement areas for grazing marsh/reedbeds and lagoon creation should be sought elsewhere along the South coast (link to grazing marsh, lagoon and reedbed targets). There are landscape implications and its is important that public access to rides/banks should be carefully managed so that disturbance is minimised and the value of the area for birds is not reduced.

4.2.2 Natural Area biodiversity targets for habitats

This section details the targets which are relevant to the Solent and Poole Bay Natural Area, as detailed by English Nature.

Saline lagoons

- Safeguard and maintain current extent of saline lagoon habitat, (subject to natural change).
- Consider opportunities for creating up to 15 hectares of saline lagoon habitat taking into account of national guidance.
- **Specific target:** increase by 15 hectares by 2010. This target will be subject to revision as further evaluation of managed realignment opportunities is being undertaken.

Seagrass beds

- Maintain the current extent and distribution of Seagrass beds, within the constraints of natural population fluctuations.
- Ensure that coastal water quality objectives and nutrient standards are achieved by 2010 to ensure existing seagrass beds fulfil their important ecological and conservation importance.
- Assess feasibility of restoration of damaged or degraded Seagrass beds.

Coastal sand dunes

- Protect the existing sand dune resource along the Solent and Poole Bay frontage from further losses (subject to natural change). Ensure that shoreline management plans promote policies which will allow natural processes for the creation and maintenance of dunes to operate, where practicable, and so sustain the area and quality of this habitat.
- **Specific target:** maintain 330 hectares by 2010.
- Maintain the current extent and distribution of dune grassland/heath currently in favourable condition, by ensuring that they continue to receive appropriate management.
- Improve the condition of 90 hectares of dune grassland and heaths that are degraded by neglect or inappropriate management by 2010.

- **Specific target:** restore 90 hectares by 2010.

4.2.3 Summary of main targets

The biodiversity targets outlined here have similar requirements for each habitat, which are summarised below:

- maintain the current extent of habitat;
- improve by appropriate management the quality of habitat;
- consider opportunities to create habitat;
- reinstate and rehabilitate habitats where appropriate; and
- aim to maintain the free functioning of coastal processes.

4.2.4 Existing policies

The Solent and Poole Bay Natural Area is covered by four SMPs: the Eastern Solent SMP (HR Wallingford Ltd., 1997), the Western Solent SMP (Halcrow, 1998A), the Poole and Christchurch Bays SMP (Halcrow, 1998B) and the Isle of Wight SMP (Halcrow, 1996). The above SMPs have been studied for this report and reference to individual plan units and their existing policy is made for each biodiversity opportunity identified.

Following on from the publication of SMPs, Coastal Strategies have been commissioned to examine sub-sections of SMP frontages. These strategies investigate the SMP policies in more detail and have often make further recommendations. The coastal strategies have not been thoroughly analysed within this report but references to these strategies are made as and when these they were mentioned at the workshop. The Solent CHaMP will be a key document to inform the development of shoreline management strategies with particular regard to meeting the conservation needs of the European marine site (Bray, 2003)

4.3 Environmental enhancement opportunities

This section presents the biodiversity opportunities that have been identified by members of conservation organisations and local authorities at the workshop. This section concentrates on those opportunities that require changes to the existing SMP policy to be undertaken.

In addition to identifying biodiversity opportunities, this section also highlights the potential habitat gains and losses relative to the BAP (national and local) targets and the potential issues where these have been identified during the workshop. However, detailed investigations have not been undertaken to assess the financial and technical feasibility of the proposals.

The discussion below is divided into each SMP. The opportunities identified within the Isle of Wight SMP are discussed in Section 4.3.1, those within the East Solent SMP coastline in the Section 4.3.2. Opportunities within the East Solent SMP harbours are covered in Section 4.3.3. Section 4.3.4 includes the opportunities within the West Solent SMP and Section 4.3.5 refers to the Christchurch and Poole Bay SMP.

4.3.1 Isle of Wight SMP

Wootton Creek - RYD 3 of the Isle of Wight SMP

Current SMP Policy: **Hold the Line**

The SMP specifies that the upstream section of Wootton Creek (inland of Wootton Bridge) is no longer fully intertidal and is dammed to form The Old Mill Pond. The amount of water entering the Old Mill Pond is currently managed. At the workshop, it was highlighted that there is an opportunity for increasing the intertidal area within the Mill Pond. The existing dam could be removed and the coastline effectively realigned inland. Consideration should be given to existing saline lagoon habitat. This option has previously been investigated by the Environment Agency.

Suggested SMP Policy: **Hold the Line with managed realignment upstream**

This would apply only for the upstream section of Wootton Creek in the Old Mill Pond.

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Unknown
Considerations:	Agricultural land, saline lagoons and flood defence issues

Puckpool Hill Road to Salterns Road, Seaview - RYD 6 of the Isle of Wight SMP

Current SMP Policy: **Hold the Line**

Managed realignment could be considered for the area of the Duver. The removal of the existing sea wall or a culvert under the road would create intertidal area where grazing marshes are currently found. These marshes are designated SSSI and Ramsar. Managed realignment in this area would result in the potential loss of saline lagoons and grazing land. This option has already been investigated by the Isle of Wight Council.

Suggested Policy: **Managed Realignment**

BAP Habitat Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Coastal grazing marsh
Considerations:	Loss of coastal grazing land of national and international importance (SSSI and Ramsar site). Drainage of nearby residential areas

The Duver, St Helens - RYD 10 of the Isle of Wight SMP

Current SMP Policy: **Hold the Line**

The area of The Duver is relatively undeveloped and designated as SSSI. At the workshop, it was suggested that a dune habitat could develop in this area. The opportunity to create improved habitats at the Old Mill Pond was also presented and this option is discussed in the following Section (Unit RYD 11 of the SMP).

Suggested SMP Policy: **No Active Intervention**

BAP Gains:	Coastal sand dune habitat, mudflats and possibly saltmarsh
BAP habitat affected:	Coastal grazing marsh
Considerations:	Undeveloped grazing land, and national designation (biological)

Bembridge Harbour - RYD 11 of the Isle of Wight SMP

Current SMP Policy: **Hold the Line**

At the workshop, a number of opportunities were identified for this unit. This mainly comprised the creation of intertidal habitats at the Old Mill Pond (see above), to the south-west of Bembridge Harbour and along the River Yar. Breaching of the existing defences, that currently protect saline lagoon and undeveloped land, was proposed. Intertidal habitats and possibly freshwater habitats could develop. It may be possible to retreat over a vast area of grazing marsh and agricultural land that goes from Bembridge (to the north east) to Yaverland (to the south west) and west of Shanklin (to the south). This area is inland and not covered by the SMP. It is known that part of this area is currently being managed by English Nature for the development of saline lagoons.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Saline lagoon, and coastal grazing marsh
Considerations:	Loss of coastal grazing marsh, agricultural land and properties

Bembridge Point to Foreland Fields - RYD 12 of the Isle of Wight SMP

Current SMP Policy: **Hold the Line**

This unit includes the Whitecliff Bay and Bembridge Ledges SSSI, which is designated for geological reasons. In order to preserve the geological importance of the site, it is important to allow dynamic coastal processes. Therefore, the removal of the existing defences at Whitecliff Bay was suggested to improve its geological exposure.

Suggested SMP Policy: **No Active Intervention**

BAP Gains:	Maritime cliffs and slopes (continuationof dynamic coastal processes)
BAP habitat affected:	Unknown
Considerations:	Properties might be at risk

Shanklin Chine to Horse Ledge - SAN 8 of the Isle of Wight SMP

Current SMP Policy: **Hold the Line**

It was highlighted that this unit contains cliffs of geological importance and dynamic coastal processes should be allowed to continue to ensure exposure of interest. This coastal area is mainly of recreational and residential use to the north and undeveloped to the south.

Suggested SMP Policy: **No Active Intervention**

BAP Gains:	Maritime cliffs and slopes (continuation/re-establishment of dynamic coastal processes)
BAP habitat affected:	Unknown
Considerations:	Properties and other assets (roads, hospital, etc.) might be at risk

Yarmouth Harbour - NEW 3 of the Isle of Wight SMP

Current SMP Policy: **Hold the Line**

At the workshop, the opportunity of breaching the seawall along a section of the Yarmouth River was proposed. Mudflats and saltmarshes could therefore be created in an area currently undeveloped and designated as SSSI, SAC, SPA and Ramsar. It is possible that agricultural land could be affected by such scheme.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Mudflats and saltmarsh
BAP habitat affected:	Coastal grazing marsh
Considerations:	Possible loss of agricultural land

Thorness Wood to the Centre of Thorness Bay - NEW 9 of the Isle of Wight SMP

Current SMP Policy: **Do Nothing**

Managed realignment was suggested for the area north and west of Whippance Farm, which is mainly coastal grazing land. This area is of nature conservation importance and partially designated as SSSI, SPA Ramsar and SINC (Sites of Importance for Nature Conservation). It is thought that this option is already being pursued as part of the Countryside Stewardship Scheme.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Coastal grazing marsh
Considerations:	Agricultural land

Gurnard Luck - NEW 11 of the Isle of Wight SMP

Current SMP Policy: **Hold the Line**

It was proposed that the coastline of the whole unit could be realigned. This would lead to the creation of intertidal habitats along the Gurnard Luck (creek) in an area of undeveloped and agricultural land. The SMP specifies that inland, the potential flood area is undeveloped, however, at the coastal edge and along Marsh Road in particular, there are several residential properties, a car park and tourist facilities. A policy of Hold the Line is therefore preferred for this unit.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Coastal grazing marsh
Considerations:	Residential properties and agricultural land

4.3.2 East Solent SMP

West Beach, Selsey to Bracklesham - Unit 3 of the East Solent SMP

Current SMP Policy: **Hold the Line and investigate further the options**

It was proposed that a large area west of West Sand caravan park could become intertidal habitats. This area is mainly floodplain agricultural land with grazing in the immediate backshore. Nature conservation interests are found as the area includes part of the Bracklesham Bay SSSI, which is designated primarily for its geological interest (foreshore) and for its wet grasslands and bird habitats (backshore). At the workshop, it was also discussed that in order to preserve the geological interest of the area, no coast defence scheme should be implemented along this coastline.

Suggested SMP Policy: **Managed Realignment/No Active Intervention**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Coastal grazing marsh
Considerations:	Agricultural land, properties and designations

Braclesham to East Wittering - Unit 4 of the East Solent SMP

Current SMP Policy: **Hold the Line**

This unit consists of a medium density residential area with some open space. The foreshore is part of the Bracklesham Bay SSSI and is designated for geological reasons. In order to preserve its geological importance, it was proposed that no further beach recharge should be undertaken.

Suggested SMP Policy: **No Active Intervention**

BAP Gains:	Maritime cliffs and slopes (continuation/re-establishment of dynamic coastal processes)
BAP habitat affected:	Unknown
Considerations:	Residential properties. Only a very small section of this coastal area is at risk of flooding

Cakeham East to East Head - Unit 5 of the East Solent SMP

Current SMP Policy: **Hold the Line**

At the workshop, it was stated that should the dynamic coastal processes be allowed to continue without any further intervention, Chichester Harbour would develop a larger harbour entrance (HR Wallingford, 2000). It was therefore suggested that East Head spit

should be allowed to migrate eastward in accordance with its morphological development to date. The area of East Head is undeveloped, but the remaining part of this unit is of medium density residential with some open space. A policy of Limited Intervention for the western part of the coastline was recommended.

Suggested SMP Policy: **Managed Realignment at East Head spit and No Active Intervention to the west**

BAP Gains:	Continuation/re-establishment of dynamic coastal processes
BAP habitat affected:	Unknown
Considerations:	Residential properties

Fort Glikicker to Browndown Ranges - Unit 11 of the East Solent SMP

Current SMP Policy: **Do Nothing**

The SMP recognises that different management options might be required for the River Alver where either hold the line or do nothing could be feasible. Managed Realignment would be preferable for the Alverstoke coast in the medium term (20 to 50 years). An opportunity for managed realignment along the River Alver was presented. The area of the proposed realignment appears to be undeveloped with a number of roads and the River Alver concrete outfall structure. The foreshore of this unit contains important dune and vegetated shingle habitats, however, the presence of such habitat at the proposed location is unknown.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Unknown, it is possible that dune and shingle habitat could be affected
Considerations:	Assets such as roads and outfall

Hill Head Harbour to Solent Breezes - Unit 13 of the East Solent SMP

Current SMP Policy: **Hold the Line at the harbour**
Do Nothing for the rest of the unit

The Hill Head Harbour to Solent Breezes unit presents a largely undeveloped stretch of shoreline comprising erodible cliffs in the northwest, and running down to a shingle ridge fronting low lying marshes and Hill Head Harbour in the south east. Inland the area is mainly undeveloped, with some agriculture land.

It was suggested that managed realignment could be carried out along the River Mean, in the existing floodplain. This area is not covered by the existing SMP and it is known that there is strong opposition to such scheme from local interest groups. An area located south of Solent Breeze, which is currently utilised for mineral extraction, could be regenerated into intertidal mudflats and marshes.

Suggested Policy: **Managed Realignment along the River Mean**

BAP Gains:	Freshwater habitats
BAP habitat affected:	Coastal grazing land
Considerations:	Agricultural land and strong opposition from local community

Solent Breezes to Hook Lake- Unit 14 of East Solent SMP

Current SMP Policy **Hold the Line**

The Solent Breezes to Hook Lake coastal unit includes the eroding cliffs of Solent Breezes and the low lying marshes, protected by a large shingle spit, at the mouth of the River Hamble. Coastal habitats could be recreated within an area south of Hook Lake, where vegetated shingle fronts undeveloped land. It was proposed that maintenance and protection of the existing vegetated shingle and, if required, partial setback would improve the quality of the coastal habitat. Coastal grazing marshes could also be created inland.

The area south of Hook Lake has limited recreational use but presents several sites of historical/archaeological interest including the Hook Saltworks. The foreshore and much of its backshore lies within the Lee-on-the-Solent to Itchener Estuary SSSI, the Solent and Southampton Water SPA and Ramsar site, the Hook with Warsash LNR and the Solent Maritime candidate SAC.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Vegetated shingle and coastal and floodplain grazing marsh
BAP habitat affected:	Vegetated shingle, unknown
Considerations:	Nature conservation designations and historical/archaeological interest.

4.3.3 East Solent SMP Harbours

Pilsey Island and Thorney Island - Chichester Harbour

Current SMP Policy: **Do Nothing**

Dune management could be carried out at the southern end of Thorney Island and on Pilsey Island in order to encourage the growth of a dynamic dune system. This area is currently undeveloped and unprotected.

Suggested Policy: **No Active Intervention**

BAP Gains:	Creation and maintenance of coastal sand dune habitat
BAP habitat affected:	Unknown
Considerations:	Unknown

Chidham Peninsula - Chichester Harbour

Current SMP Policy: **Hold the Line**

A small area at the southern tip of Chidham Peninsula, which is mainly agricultural land, was proposed for managed realignment. The Chichester Harbour nature conservation interests could benefit from the creation of intertidal habitats.

Suggested Policy: **Managed Realignment**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Unknown
Considerations:	Agriculture land

Benham and Frater - Portsmouth Harbour

Current SMP Policy: **Do Nothing**

It was proposed that opportunities for managed realignment exist along the eastern coast of the Harbour at Benham and Frater. In these areas, the shoreline is in natural state, with the exception of Ministry of Defence jetty facilities at Foxbury Point and Frater Lake. For this unit the SMP states that there is no significant risk of flooding and therefore the preferred policy is 'Do Nothing'.

Managed realignment would allow migration of the intertidal habitats landward and it is possible that freshwater habitats could develop. However, it appears that the areas host features of historical interest such as the Fort Elson, woodland and grazing marshes of nature conservation importance.

Suggested Policy: **Managed Realignment**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Woodland and coastal grazing marsh
Considerations:	Features of historical and nature conservation interest and woodland

4.3.4 Western Solent SMP

Crableck Marina to Warsash North – HAM 7 of the Western Solent SMP

Current SMP Policy: **Do Nothing**

Along the Crableck Marina to Warsash North unit, a clay embankment lines the river bank with saltmarsh and mudflats in the nearshore. Inland, it is undeveloped woodland with scattered housing. The SMP specifies that there are no assets at risk therefore a policy of No Active Intervention is preferred. At the workshop, opportunities for habitat improvements along this stretch of coast were discussed.

Suggested Policy: **No Active Intervention**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	None identified
Considerations:	Unknown

Eling Creek to Redbridge - TEST 5 of the Western Solent SMP

Current SMP Policy: **Hold the Line**

The Eling Creek to Redbridge unit comprises a foreshore of mudflats and saltmarsh of international nature conservation value, backed by the southern end of Totton. This area is densely developed and at risk from flooding. The existing SMP recommends maintaining and upgrading the existing defences in order to protect the assets at risk, which includes commercial and industrial properties, schools, recreational land and the A35 road. The Wildlife Trust has investigated the managed realignment of an area east of Totton. Details of such scheme are provided by Barneveld and Cox (1998).

Suggested Policy: **Managed Realignment**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Coastal grazing marsh
Considerations:	Infrastructures and other assets

Fawley Power Station to Fawley Oil Refinery - FAW 3 to FAW 5 of the Western Solent SMP

Current SMP Policy: **Hold the Line**

Three relatively small areas of undeveloped land to the east of the industrial area of Fawley were identified for managed realignment. These areas are currently fronted by saltmarsh and mudflats of international nature conservation value, which could therefore benefit from the scheme. Major economic assets are located within close proximity to the shore in this unit.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Mudflats and saltmarsh
BAP habitat affected:	Coastal grazing marsh
Considerations:	Major industrial asset. Policy unit defined on the basis of environmental benefit

Lee to Calshot Spit - FAW 1 of the Western Solent SMP

Current SMP Policy: **Hold the Line**

This unit is characterised by a low energy coastline with saltmarshes and mudflats. Calshot Marshes Local Nature Reserve, Solent and Southampton Water SPA and proposed Ramsar site is located within this unit and its coastline would be suitable for managed realignment. Much of its inland is undeveloped and at risk of flooding.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Coastal grazing marsh
Considerations:	Loss of coastal grazing marsh, nature conservation designations of national and international importance. Policy unit defined on the basis of environmental benefit

East of Stone Point to South of Bourne Gap - LYM 11 of the Western Solent SMP

Current SMP Policy: **Further studies are recommended**

This coastline comprises low lying agricultural land of international nature conservation value. The SMP specifies that the existing defences are in poor condition but the current value of the hinterland does not justify major expenditure to upgrade these structures in the long term. The creation of low-lying marsh habitat could be possible behind the existing shingle bank in an area that is currently undeveloped.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Short term: coastal and floodplain grazing marshes. Long term: saltmarsh
BAP habitat affected:	Unknown
Considerations:	Unknown

Lepe to East of Stone Point - LYM 10 of the Western Solent SMP

Current SMP Policy: **Hold the Line**

The Lepe to East of Stone Point unit comprises the Stoney Point National Nature Reserve and Lepe Country Park. This area is important for geological reasons and the continuation of dynamic coastal processes is important to ensure geological exposure. An area for managed realignment and creation of freshwater habitats was identified along the Dark Water.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Continuation/re-establishment of dynamic coastal processes (cliff exposure) and creation of mudflats and possibly freshwater habitat
BAP habitat affected:	Unknown
Considerations:	Current management of National Nature Reserve

Southern Beaulieu River and Warren Farm Spit - LYM 8 and 7 of the Western Solent SMP

Current SMP Policy (Unit 8): **Do Nothing**

Current SMP Policy (Unit 7): **Hold the Line**

The area at the western shore of Beaulieu river entrance was identified for managed realignment. Depending on how the managed realignment would be carried out, the current policies of either unit LYM 8 or 7, or both, would require revisions for any works to be carried out. This area appears to be undeveloped with some agricultural land fronted by saltmarsh of international nature conservation value (cSAC). The SMP specifies that this

area, including the spit and the island, contributes to the protection of the Beaulieu River from severe storms.

Suggested SMP Policy
(Unit 8): **Managed Realignment**

(Unit 7): **Managed Realignment**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Unknown
Considerations:	Possibly loss of agricultural land and protection to Beaulieu River. Policy unit defined on the basis of environmental benefit

Lymington River - LYM 4 of the Western Solent SMP

Current SMP Policy: **Hold the Line**

The existing SMP covers the lower Lymington River up to Bridge Road. Opportunities for habitat creation upstream of Lymington River were discussed. It was suggested that a habitat sequence from saltmarsh to freshwater marsh could be created.

Suggested SMP Policy: **Managed Realignment upstream**

BAP Gains:	Mudflats, saltmarsh and freshwater habitats
BAP habitat affected:	Unknown
Considerations:	Lymington River is included in the Solent and Southampton Water SPA and proposed Ramsar site

Saltgrass Lane to Lymington Yacht Haven - LYM 3 of the Western Solent SMP

Current SMP Policy: **Hold the Line**

The Saltgrass Lane to Lymington Yacht Haven shoreline is low-lying with saltmarshes and mudflats. Inland, with the exclusion of a few residential developments, the area is largely undeveloped. Sea defences protect this land from coastal flooding. The existing SMP policy is Hold the Line, however, it recognises that the effectiveness of these defences is linked to the existence, and future management, of the fronting saltmarshes.

It was reported that, with the current erosion rates of three to eight metres per year, saltmarshes have a limited future in this area unless action is taken. Two main areas were identified for managed realignment: one south of Waterford and another inland of Keyhaven Marshes. Nature conservation designations (SPA, Ramsar) would be affected by these managed realignments. It was also suggested that the sediment removed from Lymnington Harbour could be utilised to feed the existing marshes within this unit.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Mudflats, saltmarsh and coastal and floodplain grazing marshes
BAP habitat affected:	Unknown
Considerations:	Terrestrial and/or freshwater nature conservation designations

4.3.5 Christchurch and Poole Bay SMP

Parkstone Bay and Baiter Park - PHB 12 of the Christchurch and Poole Bay SMP

Current SMP Policy: **Hold the Line**

This unit includes a largely reclaimed frontage backed by recreational and residential areas. The intertidal area is designated SSSI. The SMP recognises that efforts should be made in the long term to reduce coastal squeeze. At the workshop, it was discussed that the low-lying undeveloped areas along this stretch of coastline could be realigned to create mudflats and saltmarshes and, therefore, contribute to the achievement of the local biodiversity targets.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Unknown
Considerations:	Unit contains landfill site plus residential and recreational asset. Policy unit defined on the basis of environmental benefit

Holes Bay - PHB 10 of the Christchurch and Poole Bay SMP

Current SMP Policy: **Hold the Line**

The coastal area of Holes Bay is largely reclaimed and developed. Some areas of mudflats and saltmarshes are found along its northern and western shores and are designated SSSI. It was discussed that reclaimed derelict land could be returned to the harbour, however the presence of contaminated land could be an issue.

Suggested SMP Policy: **Managed Realignment**

BAP Gains:	Mudflats and possibly saltmarsh
BAP habitat affected:	Unknown
Considerations:	Contaminated land

Hyde's Quay to Holton Point - PHB 5 of the Christchurch and Poole Bay SMP

Current SMP Policy: **Hold the Line**

The coastline presents marshes and wetland areas of international nature conservation importance (Poole Harbour SPA) fronting areas of woodland and reclaimed pasture. The existing SMP recommends hold the line in the short-term and selective managed realignment possibly behind flood banks in the long-term. Opportunities for managed realignment were identified at the workshop and it is known that opportunities for the future management of the area east of Holton Heath, in Lytchett Bay, are already under discussion. The potential for the creation of a saline lagoon was identified west of Swinsham Point.

Suggested SMP Policy: **No Active Intervention**

BAP Gains:	Mudflats, possibly saltmarsh and saline lagoon
BAP habitat affected:	Coastal grazing marsh
Considerations:	Loss of coastal grazing marsh and woodland. Implications for amenity beach to north

South Haven Point to Hyde's Quay PHB 4 of the Christchurch and Poole Bay SMP

Current SMP Policy: **Do Nothing**

This unit is characterised by mudflats and saltmarshes of international nature conservation importance. Areas of woodland and heathland with limited development and infrastructure are found inland. The existing SMP recommends do nothing in the short term with possible managed realignment at Slepe Moor. The opportunity to create a saline lagoon in a previous gravel extraction site in an area north of Crichton's Heath was identified at the workshop.

Suggested SMP Policy: **No Active Intervention**

BAP Gains:	Saline lagoon
BAP habitat affected:	Unknown
Considerations:	Beneficial use of a mineral extraction site

The Warren to Studland Sandspit – STU 2 of the Christchurch and Poole Bay SMP

Current SMP Policy: **Do Nothing**

The Warrant to Studland Sandspit includes the Studland Heath and Dunes of international nature conservation importance (Dorset Heaths (Purbeck and Wareham) and Studland Dunes SAC). The current SMP policy is of hold the line in the short term and of possible managed realignment in the long term.

Suggested SMP Policy: **No Active Intervention**

BAP Gains:	Sand dune habitats
BAP habitat affected:	None identified
Considerations:	None identified

Shell Bay - STU 3 and 4

Current SMP Policy: **Hold the Line**

The requirement for hold the line is restricted to the shoreline immediately adjacent to the ferry facilities at the eastern edge of the present management unit. For the rest of this frontage a policy of no active intervention should be promoted in order to encourage the creation of a functioning dune system.

Suggested SMP Policy: **No Active Intervention**

BAP Gains:	Functioning sand dune system
BAP habitat affected:	None identified
Considerations:	None identified

4.4 Findings

The environmental enhancement opportunities that have been identified during the workshop and that are recorded in this report would contribute to the achievement of some of the national and local BAP targets for the following habitats:

- coastal and floodplain grazing marsh;
- saltmarsh;
- mudflats;
- maritime cliffs and slopes.
- shingle;
- sea grass beds; and
- coastal sand dune.

The above opportunities could also contribute to the UK biodiversity target for saline lagoons and freshwater habitats. Apart from reedbeds, these opportunities go towards meeting all of the national and local targets. However, more detailed studies would have to be undertaken to recognise the extent and quality of habitat that could be gained in order to confirm whether these opportunities completely satisfy the current targets. In order to undertake the biodiversity opportunities identified at the workshop and discussed in this document, changes to the current SMP policies are suggested.

4.5 References

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Annex 1 National habitat targets

The descriptions which follow have all been taken from the latest information on the UK Biodiversity Action Plan website (www.ukbap.org.uk). They are included for completeness and ease of reference.

Seagrass beds

Maintain extent and distribution of seagrass beds in UK waters. Assess feasibility of restoration of damaged or degraded seagrass beds. Until surveys assess the extent of the seagrass resource, it will not be possible to assess whether restoration is necessary, or to specify a final target. An interim target of 1,000ha has been costed.

Littoral and sub littoral chalk

- ∉ Seek to retain and where possible increase the existing extent of littoral and sublittoral chalk habitats unaffected by coastal defence and other engineering works.
- ∉ Allow natural coastal processes to dictate, where possible, the geomorphology of the littoral and sublittoral environment.
- ∉ Adopt sustainable management practices for all uses on littoral and sublittoral chalk habitats.

Mudflats

- ∉ Maintain at least the present extent and regional distribution of the UK`s mudflats. This target will require compensating predicted losses to development by the restoration of mudflats. Whilst this may not be possible in the same location, it should be within the same littoral sediment cell.
- ∉ Create and restore enough inter-tidal area over the next 50 years to offset predicted losses to rising sea level in the same period. Predicted losses in the next 15 years should be offset in the next 10 years.
- ∉ Restore estuarine water quality to ensure that existing mudflats fulfil their important ecological and conservation role.

Saltmarsh

- ∉ The overall objectives of this plan are to offset the current losses due to coastal squeeze and erosion to maintain the existing extent of saltmarsh habitat of approximately 45,500 ha, and to restore the area of saltmarsh to 1992 levels (the year of adoption of the Habitats Directive which included saltmarsh as a habitat type of community interest). There is a need to identify realistic and achievable targets for creation. The results of individual estuary evaluations during the first five years of this 15 year plan will allow the headline targets set out below to be reviewed and refined. Such studies will also identify potential locations for saltmarsh creation. There will be a presumption against any further net loss of saltmarsh to land claim or other anthropogenic factors. The best available information has been used to establish the targets below.

- ∉ There should be no further net loss (currently estimated at 100 ha/year). This will involve the creation of 100 ha/year during the period of this plan. However, local losses and gains are to be expected in this essentially dynamic system.
- ∉ Create a further 40 ha of saltmarsh in each year of the plan to replace the 600 ha lost between 1992 and 1998, based on current estimates.
- ∉ Maintain the quality of the existing resource in terms of community and species diversity and, where necessary, restore the nature conservation interest through appropriate management. It will be desirable for some managed realignment sites to develop the full range of saltmarsh zonation.

Sand dune

- ∉ Protect the existing sand dune resource of about 54,500 ha from further losses to anthropogenic factors, whether caused directly or indirectly (eg by sea defence schemes affecting coastal processes).
- ∉ Offset the expected net losses due to natural causes of about 2% of the dune habitat resource over 20 years by encouraging new dunes to accrete and where possible by allowing mobile dune systems to move inland.
- ∉ Seek opportunities for restoration of sand dune habitat lost to forestry, agriculture or other human uses. A target figure of up to 1000 ha to be reinstated by 2010 (to be reviewed).
- ∉ Encourage natural movement and development of dune systems, and control natural succession to scrub and woodland where necessary.
- ∉ Maintain dune grassland, heath and lichen communities on the majority of dune systems; Atlantic dune woodland should be created on up to five carefully selected sites.

Shingle

- ∉ Prevent further net loss of existing vegetated shingle structures totalling about 5800 ha. (However local gains and losses due to storm events occur sporadically and should be accepted provided that the national and regional resources are maintained overall.)
- ∉ Prevent, where possible, further exploitation of, or damage to, existing vegetated shingle sites through human activities, and maintain the quality of existing plant and invertebrate communities which are currently in favourable condition.
- ∉ Achieve the restoration, where possible, of degraded or damaged habitats of shingle structures, including landward transitions, where such damage has been extensive and natural recovery is not likely to be initiated, by 2010.

Saline lagoons

The current number, area and distribution of coastal lagoons should be maintained and enhanced. There are at present only about 1,300 ha of known UK saline lagoonal habitats.

- ∉ Create, by the year 2010, sufficient lagoon habitat to offset losses over the last 50 years.

- Recent evaluations estimated that 38 English lagoons were lost in the later half of the eighties. Within the next 20 years the creation of at least 120 ha of lagoon habitat is considered attainable and necessary in England to keep pace with projected losses.

Maritime cliff and slopes

The research and survey outlined will provide a basis for developing more specific targets and objectives. In particular, research into the options for removal/abandonment of existing defences may allow further definition of this objective.

- Seek to maintain the existing maritime cliff resource of cliff-top and slope habitat, of about 4000 km. Maintain wherever possible free functioning of coastal physical processes acting on maritime cliff and slope habitats.
- Seek to retain and where possible increase the amount of maritime cliff and slope habitats unaffected by coastal defence and other engineering works.
- Increase area of cliff-top semi-natural habitat by at least 500 ha over next 20 years.
- Improve by appropriate management the quality of at least 30% of the maritime cliff and slope habitats, including cliff-top vegetation, by 2010, and as much as possible before 2015.

Reed beds

This target should provide habitat for 40 pairs of bitterns and provide optimum conditions for other reedbed species and should be targeted primarily in the south-east.

- Create 1,200 ha of new reedbed on land of low nature conservation interest by 2010.
- The creation of new reedbed should be in blocks of at least 20 ha with priority for creation in areas near to existing habitat, and linking to this wherever possible.
- The target should provide habitat for an estimated 60 breeding pairs of bitterns boosting numbers to previous levels. It should be targeted in the south-east of Britain.

Coastal grazing marsh

- Maintain the existing habitat extent (300,000ha) and quality.
- Rehabilitate 10,000 ha of grazing marsh habitat which has become too dry, or is intensively managed. This would comprise 5,000 ha already targeted in ESAs, with an additional 5,000 ha.
- Begin creating 2,500 ha of grazing marsh from arable land in targeted areas, in addition to that which will be achieved by existing ESA schemes.

Grazing marsh is an important habitat for a range of birds, invertebrates and plant communities. There is considerable potential for the enhancement of this biological interest and a target of 5,000 ha is considered achievable provided this is carefully targeted at core areas and where reversing fragmentation is feasible. In some cases this may be in areas where there is potential to recreate this habitat from land currently under arable cultivation. The figure of 2,500 ha could produce significant benefits if targeted carefully.

Annex 2 Attendees at IBO Workshops held in 2002

Organisation

Arun District Council (West Sussex)
Broads Authority
Country Landowners Association
DEFRA Flood Management Division
DEFRA Rural Development Service
Dorset Coast Forum
East Sussex County Council
English Nature
Environment Agency
Great Yarmouth Borough Council
Halcrow Group Ltd
Hampshire County Council
Hampshire and Isle of Wight Wildlife Trust
Horsey Estate (Norfolk)
Isle of Wight Council
Kent Wildlife Trust
National Trust
Norfolk Wildlife Trust
North Norfolk District Council
Pagham Harbour Local Nature Reserve (West Sussex)
Poole Council
Poole Harbour Commissioners
Purbeck District Council
Romney Marsh Community Project
RSPB
Sussex Wildlife Trust
Terry Oaks Associates
University of Brighton
University of East Anglia

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Front cover photographs:
Top left: Using a home-made moth trap.
Peter Wakely/English Nature 17,396
Middle left: Co_2 experiment at Roudsea Wood and Mosses NNR, Lancashire.
Peter Wakely/English Nature 21,792
Bottom left: Radio tracking a hare on Pawlett Hams, Somerset.
Paul Glendell/English Nature 23,020
Main: Identifying moths caught in a moth trap at Ham Wall NNR, Somerset.
Paul Glendell/English Nature 24,888

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