

Medway Estuary and Swale SMP

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- 1 INTRODUCTION..... 1**

 - 1.1 The Shoreline Management Plan 1
 - 1.2 Structure of the SMP 8
 - 1.3 The Plan Development Process 10

- 2 ENVIRONMENTAL ASSESSMENT..... 13**

 - 2.1 Strategic Environmental Assessment Background 13
 - 2.2 The Appraisal Process 15
 - 2.3 Stakeholder Engagement..... 15
 - 2.4 The Existing Environment 16
 - 2.5 Environmental Objectives 17
 - 2.6 Identification and Review of Possible Policy Scenarios..... 17
 - 2.7 Environmental Effects of the Preferred Plan..... 17
 - 2.8 Monitoring Requirements 18
 - 2.9 Habitats Regulations (Appropriate) Assessment 20
 - 2.10 Water Framework Compliance.....21

- 3 BASIS FOR DEVELOPMENT OF THE PLAN..... 22**

 - 3.1 Historical Perspective..... 22
 - 3.2 Sustainable Policy 22

- 4 THE PREFERRED PLAN 31**

 - 4.1 Plan for Balanced Sustainability 31
 - 4.2 Predicted Implications of the Preferred Plan..... 36
 - 4.3 Managing the Change..... 40

- 5 POLICY STATEMENTS..... 42**

 - 5.1 Introduction..... 42
 - 5.2 Content..... 42

- 6 ACTION PLAN..... 179**

 - 6.1 Objectives.....179
 - 6.2 Coastal Defence Management Activities.....179
 - 6.3 Application of the SMPin Spatial Planning..... 199
 - 6.4 Further Actions to Facilitate Medium/Long Term Policies.....201
 - 6.5 Management of SMP until Next Review..... .202

GLOSSARY

SUPPORTING APPENDICES

Appendix A	SMP Development
Appendix B	Stakeholder Engagement
Appendix C	Baseline Process Understanding
Appendix D	SEA Environmental Baseline Report
Appendix E	Issue And Objective Evaluation
Appendix F	Initial Policy Appraisal And Scenario Development
Appendix G	Preferred Policy Scenario Testing
Appendix H	Economic Appraisal And Sensitivity Testing
Appendix I	Metadatabase And Bibliographic Database
Appendix J	Habitats Regulations (Appropriate) Assessment
Appendix K	Strategic Environmental Assessment
Appendix L	Water Framework Compliance

1 INTRODUCTION

1.1 *The Shoreline Management Plan*

A Shoreline Management Plan (SMP) provides a large-scale assessment of the risks associated with coastal evolution and presents a policy framework to address these risks to people and the developed, historic and natural environment in a sustainable manner. In doing so, an SMP is a high-level document that forms an important part of the Department for Environment, Food and Rural Affairs (Defra) strategy for flood and coastal defence (Defra, 2001).

The boundaries of this SMP were determined as follows:

- Upstream limit (Medway): Normal tidal limit at Allington Lock Gate
- Upstream limit (Swale): Boundary with the Medway Estuary
- Downstream limit (Medway): River Medway Schedule 4 (Coast Protection Act 1949) Boundary with the coast and thus junction with the Isle of Grain to South Foreland SMP
- Downstream limit (Swale): The Swale Schedule 4 (Coast Protection Act 1949) Boundary with the coast and thus junction with the Isle of Grain to South Foreland SMP

Figures 1.3 and 1.4 show the area covered by the SMP.

1.1.1 *Relationship with other plans*

Shoreline Management Plans (SMPs) provide large-scale assessments of the risks associated with coastal processes for a specified length of coastline, and present policy frameworks to reduce these risks. As such, SMPs sit at the top of a hierarchy of plans that proceeds from SMPs to Strategy Plans to specific scheme designs:

Type of Plan	Purpose	Scale
Shoreline Management Plans	Aim to identify policies to manage coastal flood and erosion risks, deliver a wide ranging assessment of risks, opportunities, limits and areas of uncertainty	>150km Coast / River Catchment
Strategies	Aim to identify appropriate schemes to put the policies into practice, identify the preferred approach, including economic and environmental decisions	10-30km coast/ river
Schemes	Aim to identify the type of work to put the preferred scheme into practice, compares different options for putting the preferred scheme into practice	<5km

Throughout the SMP process it has been important to work closely with other studies and projects to make sure that these plans are co-ordinated and coherent. A range of plans are being developed / have been developed which link with the SMP to co-ordinate works for Flood and Erosion risk management in North Kent. These are illustrated in Figure 1.1 and described overleaf.

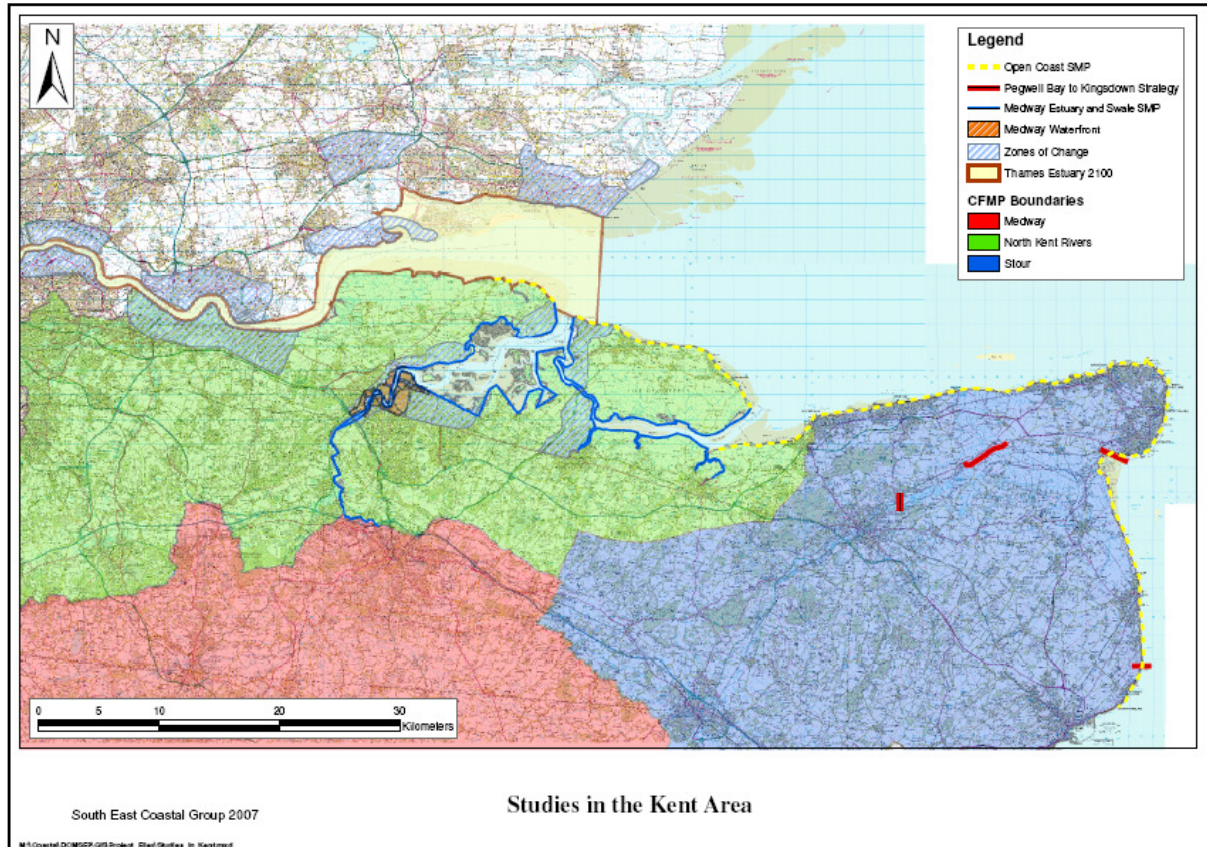


Figure 1.1 North Kent Strategic Flood, Coastal Erosion and Development Plans

Isle of Grain to South Foreland Shoreline Management Plan 2

This SMP covers the open coastline of the English Channel from the Isle of Grain in North Kent around the north of the Isle of Sheppey and then along the coastline of the mainland from Faversham Creek to South Foreland in East Kent. This is the second SMP for this section of coast and is a review of the first plan drafted in 1996. It shares coastal boundaries with the Medway Estuary and Swale SMP and the Thames Estuary 2100 (TE2100) plan around Sheerness, the Isle of Grain, Shell Ness and Faversham. The Isle of Grain to South Foreland SMP2 has been developed in tandem with the Medway Estuary & Swale SMP to ensure consistency of policy and approach.

Thames Estuary 2100 (TE2100) Strategy

The TE2100 covers from the boundaries of the Medway Estuary and Swale SMP at the Isle of Grain up the Thames Estuary and river to Teddington Lock. The Thames Estuary 2100 (TE2100) Project is an Environment Agency initiative to develop a Flood Risk Management Plan for London and the Thames Estuary for the next 100 years.

North Kent Rivers Catchment Flood Management Plan (CFMP)

Catchment Flood Management Plans (CFMPs) provide a similar level of strategic planning as SMP's, identifying long-term, broad policies for sustainable flood risk management within river catchments. These policies will form the basis for development of Strategy Plans, covering all or part of the overall catchment area, which will identify in more detail appropriate flood defence measures. Links between SMPs and CFMPs are important, where for example, a CFMP could identify land drainage/ flood management policies that could compliment or conflict with SMP policies. The North Kent Rivers CFMP covers all of the freshwater streams of North Kent north of the tidal limit of the Medway. This SMP was produced before the CFMP and the SMP policies informed the CFMP Policies. The CFMP was adopted in August 2008.

North Kent Coastal Habitat Management Plan (CHaMP)

Coastal Habitat Management Plans quantify habitat change, (loss and gain), and recommended measures to prevent future losses. The plans also include strategic habitat monitoring programmes to map future changes to be delivered through Shoreline Management Plans (SMP's) and flood and coastal defence strategies and schemes. The North Kent CHaMP, completed in 2002, provides a strategic overview of the consequences of long term predicted shoreline changes for the North Kent area, on designated habitats and species. The approved North Kent CHaMP has informed the development of this SMP.

Greater Thames Estuary Coastal Habitat Management Plan (CHaMP)

The Greater Thames Estuary CHaMP is currently being undertaken and will inform the TE2100 Strategy on the provision of compensatory and replacement habitat. This will review and replace the 2002 North Kent CHaMP. The SMP has taken account of the key findings of the draft Greater Thames Estuary CHaMP. The extent of the Greater Thames Estuary CHaMP is shown in Figure 1.2.

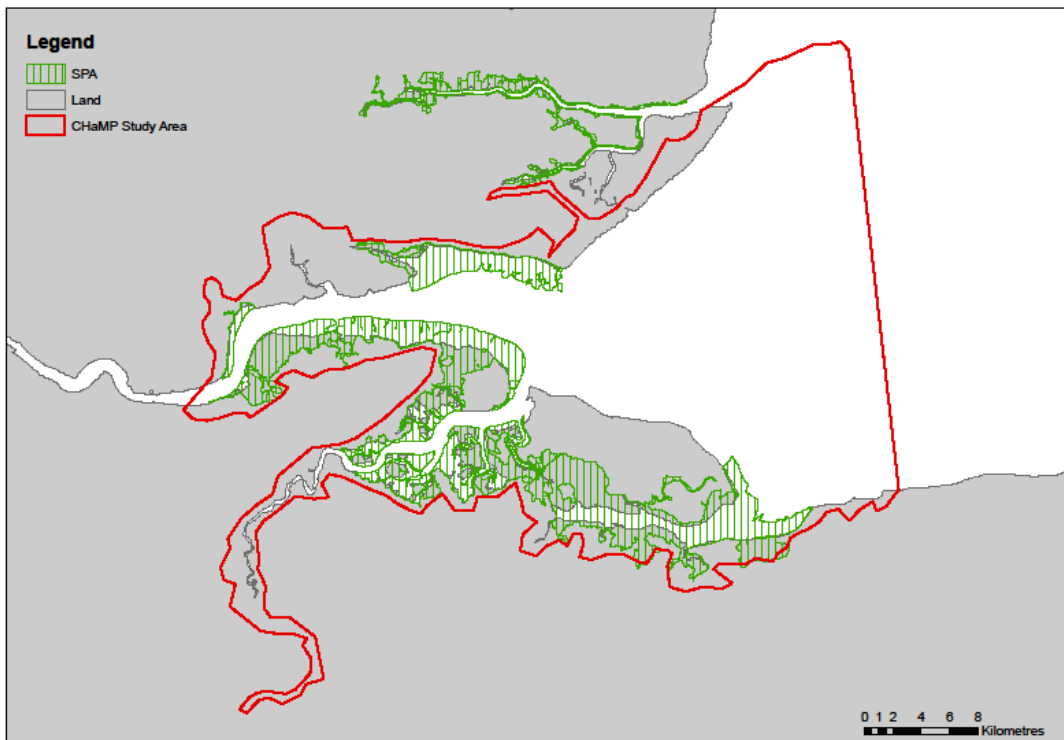


Figure 1.2 **Extent of the Greater Thames Estuary CHaMP**

Boundaries & Interfaces of the Medway Estuary & Swale Shoreline Management Plan (SMP)

The boundaries of the Medway Estuary & Swale Shoreline Management Plan have been established to link

- a) at the fluvial interface with the North Kent Rivers CFMP at the normal tidal limit of the River Medway at Allington Lock.
- b) at the mouth of each of the Medway & Swale estuaries at the 'Schedule 4 Boundary' (Coast Protection Act 1949) where the estuary officially meets the sea. This is the common interface of the Medway Estuary & Swale and the Isle of Grain to South Foreland Shoreline Management Plans.

1.1.2 Guiding principles

The SMP is a non-statutory, policy document for coastal defence management planning. It takes account of other existing planning initiatives and legislative requirements, and is intended to inform wider strategic planning¹. It does not set policy for anything other than coastal defence management.

The SMP promotes management policies for a coastline into the 22nd century, to achieve long-term objectives, while being technically sustainable, environmentally acceptable and economically viable. It is, however, recognised that given the difference between short and long term objectives, changes to management policy in the short term may be unacceptable. Thus the SMP provides a high level, step by step management plan for meeting objectives with appropriate management change i.e. a 'route map' for decision makers to move from the present situation towards a more sustainable future.

The policies that comprise this plan have been defined through the development and review of shoreline management objectives, representing both the immediate and longer term requirements of stakeholders, for all aspects of the coastal environment. Together with a thorough understanding of the coastal and estuarine processes operating on the shorelines of the estuaries, these objectives provide a thorough basis upon which to appraise the benefits and impacts of alternative policies, both locally and plan area wide. In this way, the selection of policy takes equal account of all relevant features in identifying the best sustainable management solutions.

After the first round of SMPs was completed in England and Wales, a review funded by Defra (2001) examined the strengths and weaknesses of various shoreline management plans and hence guidance was issued by Defra in 2003. Three 'pilot' SMPs (Sheringham to Lowestoft, South Foreland to Beachy Head and Beachy Head to Selsey Bill) were used to test Interim Procedural Guidance, lessons learnt from the pilots were fed into the guidance, which was subsequently updated and re-issued in 2006².

¹ The planning reforms under the Planning and Compulsory Purchase Act 2004 identify a requirement for Regional Spatial Strategies (regional level statutory planning document) and Local Development Documents (local level statutory planning document). These are required to contribute to the achievement of sustainable development and are supported by a range of government planning policy advice and guidance, in particular Planning Policy Statements (PPSs) and their predecessors Planning Policy Guidance Notes (PPGs). This advice and guidance shapes and directs planning at the regional and local level.

² Defra (2006) Shoreline Management plan Guidance. March 2006.

Some of this guidance is targeted at achieving greater consistency in the assessments and presentation of these plans, but there are more fundamental issues that have been identified, which this and other SMPs must address.

One significant issue is the inappropriateness of certain policies which, when tested in more detail with a view to being implemented, may be found to be unacceptable or impossible to justify either economically or technically. It is therefore important that this SMP is realistic, given known legislation and constraints, and does not promise what can not be delivered. There is no value in a long-term plan which has policies that are driven by short-term politics and cannot be justified once implementation is considered several years in the future. Equally, whilst selection of the preferred plan has considered the affordability of each policy, its adoption by the authorities involved does not represent a commitment to fund its implementation. Ultimately, the economic worth of policy implementation must be considered in the context of budgetary constraints (whether private or government funding), and it cannot be guaranteed that budgets will be available for all policies.

Equally, the plan must also remain flexible enough to adapt to changes in legislation, politics and social attitudes. The plan therefore considers objectives, policy setting and management requirements for 3 main epochs; from the present day, medium-term and long-term (corresponding broadly to time periods of 0 to 20 years, 20 to 50 years and 50 to 100 years respectively). There is a need to have a long-term sustainable vision, which may change with time, but should be used to demonstrate that flood and coastal defence decisions made today are not detrimental to the achievement of that vision.

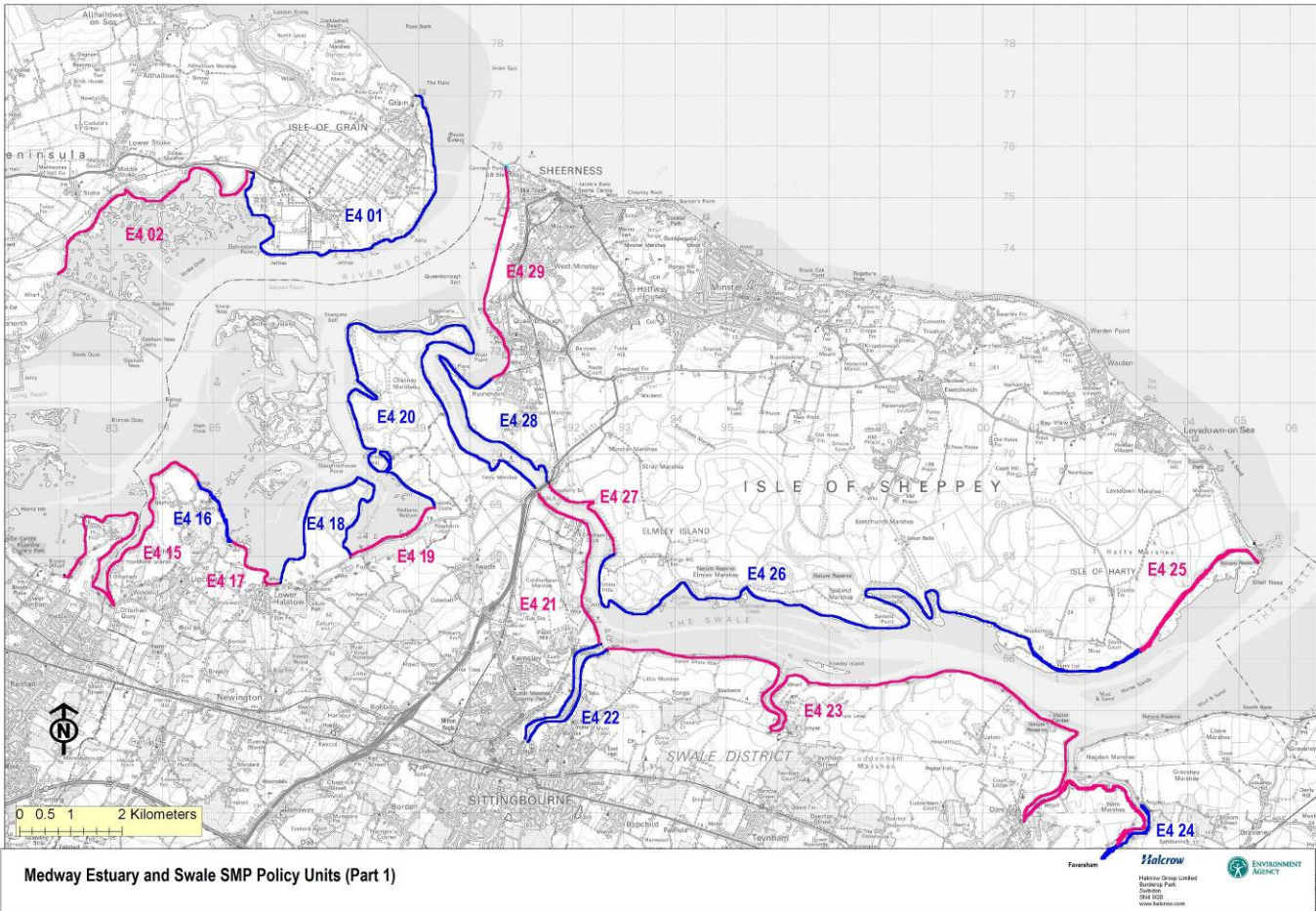


Figure 1.3: Medway Estuary and Swale SMP Policy Units (part 1).

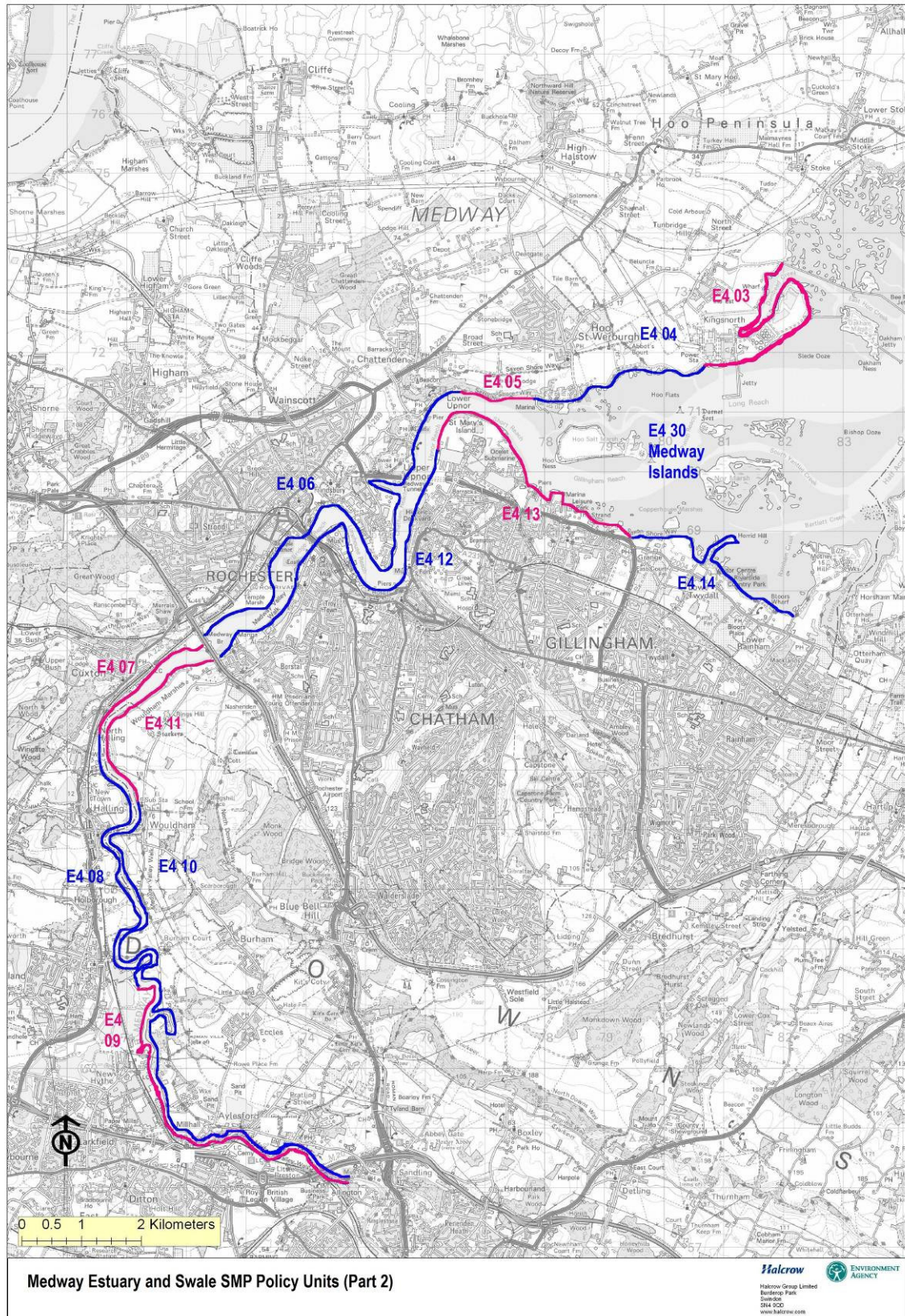


Figure 1.4: Medway Estuary and Swale SMP Policy Units (part 2).

1.1.3 Objectives

The objectives of the SMP are as follows:

- To define, in general terms, the flooding and erosion risks to people and the developed, historic and natural environment within the SMP area over the next century;
- To identify the preferred policies for managing those risks;
- To identify the consequences of implementing the preferred policies;
- To set out procedures for monitoring the effectiveness of the SMP policies;
- To inform planners, developers and others of the risks identified within the SMP and preferred SMP policies when considering future development of the shoreline and land use changes;
- To comply with international and national nature conservation legislation and biodiversity obligations; and,
- To highlight areas where knowledge gaps exist.

1.1.4 The SMP Policies

The shoreline management policies considered are those defined by the Defra (2006) SMP guidance, they are:

Hold the Line	By maintaining or changing the standard of protection;
Advance the Line	By building new defences on the seaward side of the original defences;
Managed Realignment	By allowing the shoreline to move backwards or forwards, with management to control or limit movement; and,
No Active Intervention	Where there is no investment in coastal defences or operations.

The Client Steering Group has, however, also re-defined some policies as '**Managed Realignment with localised Hold the Line**' along some frontages where there is a potential for managed realignment along part(s) of the shoreline. The policy has been re-named to allow for more flexible estuary management in the future and to discourage new development in the area.

1.2 Structure of the SMP

The recommended plan and policies presented in this SMP are the result of numerous studies, assessments and discussions performed over a period of time. To provide clarity for different readerships, the documentation to communicate and support the plan is provided in a number of parts. At the broadest level, these are divided into two:

- The Shoreline Management Plan; and,
- A series of supporting documents presented as appendices to the management plan.

1.2.1 The Shoreline Management Plan

This document provides the management plan for the next 100 years and the policies required for it to be implemented. This is intended for general readership and is the main tool for communicating intentions. Whilst the justification for decisions is presented, it does not provide all of the information behind the recommendations. Further supporting information is contained in the Appendices.

The plan is presented in five parts:

- | | |
|-----------|---|
| Chapter 1 | Gives details on the principles, aims, structure and background to its development. |
| Chapter 2 | Provides details of how the SMP meets the requirements of a Strategic Environmental Assessment (SEA). |
| Chapter 3 | Presents the basis for development of the Plan, describing the concepts of sustainable policy and providing an understanding of the constraints and limitations on adopting certain policies. |
| Chapter 4 | Presents the preferred Plan at high level for the SMP as a whole, discussing the rationale, implications, and requirements to manage change. The shoreline is considered in five broad sections. |
| Chapter 5 | Provides a series of statements for each of the 30 shoreline policy units that detail the location-specific policies proposed to implement the preferred Plan and the local implications of these policies. |
| Chapter 6 | The Action Plan provides a programme for future activities which are required to progress the plan between now and its next review in 5 to 10 years. |

Although it is expected that many readers will focus upon the local details in Chapters 4 and 5, it is important to recognise that the SMP is produced for the estuaries as a whole, considering issues beyond specific locations. Therefore, these statements must be read in the context of the wider-scale issues and policy implications, as reported in Chapters 2, 3 and in the Appendices to the Plan.

1.2.2 SMP Supporting Documents and Appendices

The accompanying documents provide all of the information required to support the plan. This is to ensure that there is clarity in the decision-making process and that the rationale behind the policies being promoted is both transparent and auditable. The documents are supported by a Glossary of Terms.

The supporting information is largely of a technical nature and is provided in nine Appendices:

- A. SMP Development: This reports the history of development of the SMP, describing more fully the plan and policy decision-making process.
 - B. Stakeholder Engagement: Stakeholders have had an important role in shaping the plan. All communications from the stakeholder process will be provided here, together with information arising from the consultation process.
 - C. Baseline Process Understanding: Includes baseline process report, defence assessment, No Active Intervention (NAI) and With Present Management (WPM) assessments and summarises data used in assessments.
 - D. SEA Environmental Baseline Report (Theme Review): This report identifies and evaluates the environmental features (human, natural, historical and landscape) in terms of their significance and how these need to be accommodated by the SMP.
 - E. Issues and Objective Evaluation: Provides information on the issues and objectives identified as part of the Plan development, including appraisal of their importance.
-

- F. Initial Policy Appraisal and Scenario Development: Presents the consideration of generic policy options for each frontage, identifying possibly acceptable policies, and their combination into 'scenarios' for testing, together with the process assessment and objective appraisal for each scenario.
- G. Preferred Policy Scenario Testing: Presents the policy assessment and appraisal of objective achievement towards definition of the Preferred Plan (as presented in the Shoreline Management Plan document).
- H. Economic Appraisal and Sensitivity Testing: Presents the economic analysis and sensitivity testing undertaken in support of the Preferred Plan.
- I. Metadatabase and Bibliographic database: All supporting information used to develop the SMP is referenced for future examination and retrieval.
- J. Habitats Regulations Assessment: Presents the assessment of the effects of the policies on European sites.
- K. Strategic Environmental Assessment (SEA): Presents the SEA process carried out for the SMP.
- L. Water Framework Compliance: Presents a retrospective Water Framework Directive Assessment.

1.3 The Plan Development Process

1.3.1 Development of the SMP

The development of the Medway Estuary and Swale Shoreline Management Plan has taken account of:

- Latest studies (e.g. Futurecoast (Defra 2002): a geomorphology-based project, which focused upon providing an improved understanding of larger-scale coastal behaviour in the UK; North Kent Coastal Habitat Plan (CHaMP) (Posford Haskoning, 2002) and Environment Agency Indicative Flood Mapping³;
- Issues identified by most recent defence planning (i.e. the Isle of Sheppey Coastal Defence Strategies);
- The results of coastal monitoring activities;
- recent changes in legislation (e.g. the requirement for an Appropriate Assessment to be carried out under the EU Habitat Directives); and,
- Changes in national defence planning requirements (e.g. the need to consider 100 year timescales in future planning as opposed to the 50 year timescale of the original SMPs, modifications to economic evaluation criteria etc.).

Reviews of the SMP are anticipated to be carried out on a 5 to 10 year basis, although this timing will be driven by the availability of new information and advances in the understanding of the estuaries.

³ Environment Agency Indicative Floodplain 2005.

1.3.2 Production of the 2006 SMP

Development of this SMP has been led by a Client Steering Group (CSG) comprising relevant members of the South East Coastal Group. These include technical officers and representatives from Kent County Council, Swale Borough Council, Medway Council, Tonbridge and Malling Council, Canterbury City Council, the Environment Agency, Natural England and English Heritage. The Client Steering Group also included a representative from Herrington Consultants. Several others were invited but were unable to attend meetings.

The SMP process has involved approximately 60 stakeholder organisations at key decision points, through formation of a Key Stakeholder Forum (KSF). Meetings with the KSF have been held to help identify and understand the issues, to review the objectives and set direction for appropriate management scenarios. The stakeholders also reviewed and commented on the preferred plan policies.

SMP development has also been assisted by regular involvement of members representing each of the operating authorities (the councils and the Environment Agency), through an Elected Members Forum (EMF). This group comprised elected members from each of the councils, Medway District Council, Swale Borough Council, Tonbridge and Malling Borough Council and Kent County Council (generally the relevant Cabinet Portfolio holder) and a representative from the Regional Flood Defence Committee. The EMF members have attended meetings with a remit from their organisation to 'inform and comment on' the developing stages of the SMP thereby providing some degree of input into policy development, by those who will ultimately be adopting the policies. The EMF has met at the same stages as the KSF, providing a review and informal approval of development and outputs (including matters arising from KSF discussions).

The SMP is based upon information largely gathered between December 2005 and April 2006, provided by numerous parties contacted during this period. This included contact with approximately 270 identified consultees. This was followed up with information interpretation and further meetings with the key stakeholders, elected members and the steering group committee.

The main activities in producing the SMP include:

- Development and analysis of issues and objectives for various locations, assets and themes, including meetings with the Key Stakeholders and Elected Members;
 - Strategic Environmental Assessment (SEA) including an SEA Environmental Baseline Report (Theme Review), reporting upon human, historic and natural environmental features and issues, evaluating these to determine the relative importance of objectives;
 - SEA Report detailing the SEA of the preferred SMP;
 - Analysis of the impact of coastal processes and coastal evolution for baseline cases of not defending and continuing to defend the coastline as at present;
 - Agreement of objectives with the Key Stakeholders and Elected Members, to determine possible policy scenarios;
 - Development of policy scenarios based on key objectives and primary drivers (agreed with the Key Stakeholders and approved by the Elected Members) for sections of the frontage;
 - Examination of estuarine and coastal evolution in response to these scenarios and assessment of the implications for the human, historic and natural environment;
 - Determination of the preferred plan and policies through review with the Key Stakeholders and Elected Members, prior to compiling the SMP document;
 - Consultation on the proposed plan (including SEA) and policies;
-

- Finalisation of the SMP following consultation; and,
- Adoption of the SMP by Local Authorities, Natural England and the Environment Agency.

The diagram in Figure 1.5 illustrates the SMP process up to and including Public Consultation.

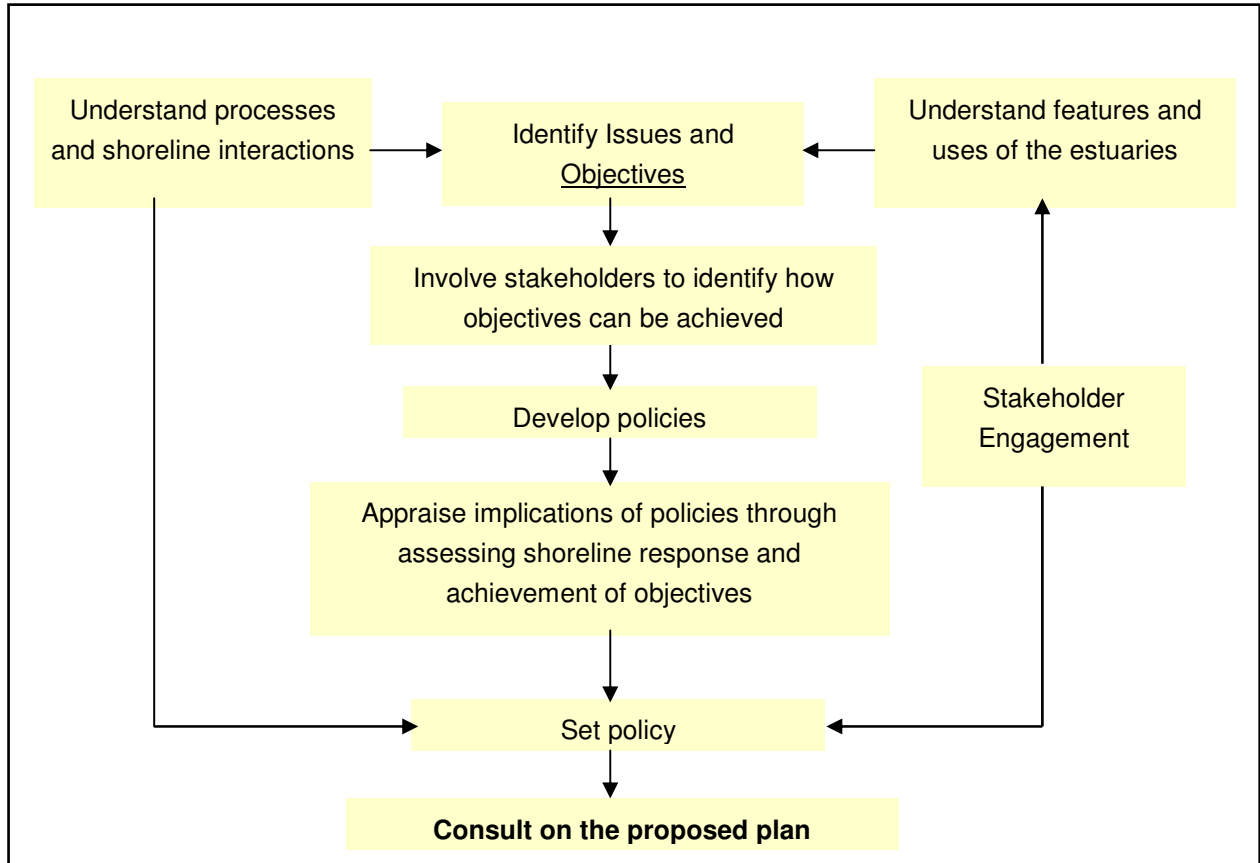


Figure 1.5: A diagrammatic summary of the SMP process. (Adapted from Defra, 2006)

2 STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

2.1 *SEA Background*

Strategic Environmental Assessment (SEA) is the systematic appraisal of the potential environmental consequences of high level decision-making, such as policies, plans, strategies and programmes, before they are approved. The purpose of SEA is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes, with a view to promoting sustainable development.

Directive 2001/42/EC of the European Parliament and of the Council, and the associated Environmental Assessment of Plans and Programmes Regulations 2004, requires that a Strategic Environmental Assessment (SEA) be carried out by certain plans and programmes that are required by legislative, regulatory or administrative provisions. The Directive is intended to ensure that environmental considerations (both good and bad) are taken into account alongside other economic and social considerations in the development of relevant plans and programmes. Whilst it has been determined that SMPs are not required by legislative, regulatory or administrative provisions, they do set a framework for future development and have much in common with the kind of plans and programmes for which the Directive is designed. Therefore, Defra has recommended that environmental appraisal of the SMPs be undertaken in line with the approach of the Directive.

In developing the Medway Estuary and Swale SMP, the environment has been considered alongside social, technical and economic issues. An SEA Environmental Baseline Report (Theme Review) **Appendix D** has been prepared to describe the environmental baseline characteristics of the SMP area and to summarise the scoping process.

The SEA Report in **Appendix K** documents the SEA process for the Medway Estuary and Swale SMP and identifies how the plan achieves the requirements of the 2004 Regulations. The text is sub-divided into sections representing the key requirements of the Regulations, and identifies the sections of the SMP documentation in which the relevant information is presented.

This chapter summarises the key elements of the SEA process and the environmental impacts of the preferred plan.

A signposting table (Table 2.1) has also been included, which details the SEA requirements and where this information can be located within the SMP documents.

Table 2.1: SEA signposting table

Environmental Report Requirements	Location of information within SMP Report
<p>(a) an outline of the:</p> <ul style="list-style-type: none"> • contents; • main objectives of the plan or programme; and, • relationship with other relevant plans and programmes; 	<p>Main Document - Section 1.2</p> <p>Main Document – Sections 1.1.3</p> <p>Main Document – Section 1.1.1 & 3.2.3</p>
<p>(b) the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;</p>	<p>Main Document – Section 2.4</p> <p>Appendix C – Baseline Process Understanding:</p> <p>Section C1 – Assessment of Estuary Dynamics</p> <p>Section C3 – Baseline Scenario 1: No Active Intervention</p> <p>Section C5 – Supporting Information</p>
<p>(c) the environmental characteristics of areas likely to be significantly affected;</p>	<p>Appendix D – SEA Environmental Baseline Report (Theme Review)</p> <p>Section D2 – Natural Environment</p> <p>Section D3 – Landscape and Character</p> <p>Section D4 – Historic Environment</p>
<p>(d) any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;</p>	<p>Appendix D – SEA Environmental Baseline Report (Theme Review)</p> <p>Section D2 – Natural Environment</p> <p>Appendix J – Habitats Regulations Assessment</p>
<p>(e) the environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation;</p>	<p>Main Document – Section 2.5</p> <p>Appendix E – Issues and Objectives Evaluation</p> <p>Appendix G – Scenario Testing</p> <p>Section G3 – Objective Appraisal</p> <p>Appendix J – Habitats Regulations Assessment</p>
<p>(f) the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors;</p>	<p>Main Document – Section 2.7</p> <p>Main Document – Section 4.2</p> <p>Appendix K - SEA</p> <p>Appendix J – Habitats Regulations Assessment</p>

Environmental Report Requirements	Location of information within SMP Report
(g) the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme;	Main Document – Section 6 Action Plan Appendix K - SEA Appendix J – Habitats Regulations Assessment
(h) an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;	Main Document Section 4 – Overview of the Shoreline Management Plan Section 5 – Policy Statements Appendix G Section 12 - Preferred Option
(i) a description of the measures envisaged concerning monitoring in accordance with Article 10;	Main Document – Section 6 Action Plan Appendix K - SEA
(j) a non-technical summary of the information provided under the above headings.	Main Document – Section 2 Environmental Assessment Appendix K - SEA

2.2 The Appraisal Process

A Shoreline Management Plan (SMP) provides a large-scale assessment of the risks associated with coastal evolution and presents a policy framework to address these risks to people and the developed, historic and natural environment in a sustainable manner. The SMP is a non-statutory, policy document for flood and erosion risk management planning. It takes account of other existing planning initiatives and legislative requirements, and is intended to inform wider strategic planning. It does not set policy for anything other than coastal defence management.

Full details on the background to the SMP and the appraisal process are set out in Chapters 1 and 2, with the exact details of the procedure followed in development of the Plan set out in **Appendix A**.

2.3 Stakeholder Engagement

Stakeholders have been involved in the SMP appraisal process, through the formation of a Key Stakeholders Forum (KSF) and an Elected Members Forum (EMF), which is one of the key changes from the first round of SMPs. This involvement has:

- Been undertaken throughout development of the SMP;
- Given stakeholders an opportunity to comment on the environmental appraisal of options; and,
- Allowed representations made by the stakeholders and the public to be taken into account in the selection of policy options.

The KSF includes representatives from interests including local authorities, nature conservation, industry and heritage. This group has met periodically throughout the SMP development process to input information and review outputs as the study progressed. The EMF comprises a representative from each of the local authorities and the Environment Agency, attending with a remit to agree the

various stages of the SMP as it progresses. Again, this group has met throughout the plan development, agreeing to the outputs once they have been discussed with the KSF.

In this way, the views of those whom the SMP policies will affect are involved in its development, ensuring that all relevant issues are considered, and all interests represented. The interests of landowners and residents have been represented through the involvement of Elected Members, and the views of all stakeholders are now sought through the present consultation process on the recommended policies.

Full details of all stages of stakeholder engagement undertaken during development of the draft Plan are presented in **Appendix B**. This includes the copies of briefing materials and records of stakeholder inputs.

2.4 The Existing Environment

The shorelines of the Medway and Swale estuaries, covered by this plan, are diverse in their physical form, human usage and natural environment. This includes:

- The major industrial and commercial areas along the shoreline of the constrained channel in the outer Medway estuary;
- The wide middle Medway estuary with extensive saltmarsh islands and mudflats and extensive areas of reclaimed freshwater habitats behind defences;
- The large urban areas of the Medway Towns;
- The narrow meandering channel of the inner Medway estuary;
- The extensive floodplains bordering the Swale estuary; and,
- Many areas designated and protected for their heritage, landscape and environmental value.

The current state of the environment is described in the SEA Environmental Report ('Theme Review'), presented in **Appendix D** to this report. This identifies the key features of the natural and human environment of the shoreline, including commentary on the characteristics, status, relevant designations, and commentary related to the importance of the features and the 'benefits' they provide to the wider community. The benefits assessment is provided in support of the definition of objectives (see **Section 2.5**).

In addition to the review of the natural and human environment, the extent and nature of existing coastal defence structures and management practices are presented in the 'Defence Report' in **Appendix C**.

This is supplemented by the 'Assessment of Estuary Dynamics' baseline report, in **Appendix C**, which identifies the contemporary physical form of the estuaries and the processes operating upon them.

The assessment summarised previous workers' findings relating to the future evolution of the two estuaries and builds on this understanding by further analysing the geomorphological form of the estuaries and comparing it with historical changes in saltmarsh area. It should be noted that there is some uncertainty regarding the predictions made by previous workers in terms of saltmarsh expansion and sediment supply. It is therefore recommended that the uncertainty in the predicted expansion of saltmarshes in the future could be reduced by undertaking further studies. This would help inform and reduce uncertainty in future revisions of the SMP.

2.5 Environmental Objectives

An integral part of the SMP development process has been the identification of issues and definition of objectives for future management of the shoreline. This was based upon an understanding of the existing environment (**Section 2.4**), the aspirations of Stakeholders (**Section 2.3**), and an understanding of the likely evolution of the shoreline under a hypothetical scenario of 'No Active Intervention' (**Appendix C**), which identifies the likely physical evolution of the estuaries without any future defence management and hence potential risks to shoreline features.

These objectives include all relevant plans, policies, etc associated with the existing management framework, including all identified opportunities for environmental enhancements.

The definition and appraisal of objectives has formed the focus of engagement with stakeholders during development of the SMP (as identified in **Appendix B**). The full list of issues and objectives defined for this SMP are presented in **Appendix E**, which is supplemented by background information provided in the SEA Environmental Baseline Report (**Appendix D**).

Appendix G includes consideration of how the objective, and hence the 'environment', would be affected under the 'No Active Intervention' scenario, also their achievement under the policy options considered feasible for that frontage, with consideration of international and national designations obligations and biodiversity. **Chapter 5** of this document also details consideration of the potential environmental effects of the preferred policies.

2.6 Identification and Review of Alternative Policy Scenarios

As identified in **Chapter 1**, the SMP considers four generic policies for shoreline management. **Appendix F** presents the results of the initial consideration of these policies to define 'policy scenarios'. This identifies those options taken forward for detailed consideration, and identifies why the alternatives have not been considered.

The 'policy scenarios' defined, have then been appraised to assess the likely future evolution of the shoreline, from which the environmental impacts can be identified. The process appraisal of these scenarios is presented in **Appendix G**. The results of this evolution, in terms of risks to coastal features, are then used to appraise the achievement of objectives for each scenario. This is reported in the issues and objectives table in **Appendix G**.

Annex 1 of Appendix K presents the environmental assessment of the alternative SMP policy options on SEA receptors.

2.7 Environmental Effects of the Preferred Plan

The environmental effects of the preferred plan on the SEA receptors, is presented in **Annex 2** of the SEA Report (**Appendix K**).

Based upon the outputs from the testing of policy scenarios (**Appendix G**), the preferred plan has been defined. This is reported for the whole SMP frontage in **Chapter 4**, with specific details for each Policy Unit presented in **Chapter 5**.

Chapter 4 includes the 'Plan for Balanced Sustainability' (**Section 4.1**) defining the broad environmental impacts of the plan, based upon the appraisal of objectives. This chapter also presents the 'Predicted Implications of the Preferred Plan' (**Section 4.2**) under thematic headings.

The thirty individual Policy Units in **Chapter 5** each present the Preferred Plan for the Unit identifying the justification, and then presents the policies to achieve the Plan over the 100 year period, presenting the detailed implications of the policies and identifying any mitigation measures that would be required in order to implement the policy.

2.8 Monitoring and Further Study Requirements

The preferred policies are considered to be viable, based on the assessment of best available information, however, further research will be required to fully inform the details of their delivery and address uncertainties. Where the preferred plan for any Policy Unit has specific monitoring or detailed study requirements to help clarify uncertainties, this is identified in the relevant 'Policy Unit Statement' (**Chapter 5**).

Implementation of the SMP and compliance with the Habitats Regulations Assessment (**Appendix J**) relies on the supply of increasingly detailed and robust information from the geomorphological and ecological studies cited in the Action Plan (**Section 6**).

For managed realignment policies, geomorphological studies will provide data to inform the design and fully assess the best manage the physical effect and benefit of the policies. Ecological studies will provide data to inform how the integrity of designated wildlife (SSSI, Natura 2000) sites will be best managed through the scale and location of managed realignment. Impacts will be mitigated through the choice of appropriate managed realignment lines, through design of flood defences including selection of suitable materials and finish, as well as through continued consultation with statutory consultees (e.g. Natural England and English Heritage) and other specialists.

At this level of appraisal, environmental sources of uncertainty such as buried archaeology and unknown ground conditions or contamination have been dealt with through desk study only. There is therefore some risk that closer inspection to inform the development of strategies and schemes may identify constraints that may change approaches to flood management at particular localities.

In addition, in carrying out the SEA, solutions that are environmentally justifiable have been selected based on existing data sources and baseline data. The assessment of cumulative impacts is therefore limited by changing environmental characteristics and future development.

Detailed monitoring and mitigation requirements will be investigated in detail as part of, or in preparation for, future strategy studies and schemes.

Future monitoring and investigations required to address the limitations of the SMP are detailed in the SMP Action Plan (**Section 6** - developed following Public Consultation).

In addition, where a proposed policy may result in the loss of heritage features (known and unknown) it will also be important to consider an appropriate programme of survey, recording and investigation to record these important sites, and those potential features not yet identified.

The Action Plan also identifies estuary wide studies that will be required to inform the policies (see **Section 6.2**). These studies will be undertaken to inform further studies identified in both the Medway Estuary and Swale SMP and the Isle of Grain to South Foreland SMP2.

Particular requirements relate to further (or ongoing studies) at the following locations in Table 2.2:

Table 2.2: Monitoring and further study requirements for policy units.

Policy Unit		Requirements
E4 02	Colemouth Creek to Bee Ness Jetty	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 04	Power Station to Cockham Wood	Further studies to investigate Managed Realignment i.e. the flood risk consequences of undertaking managed realignment; future morphology of the estuary define the standard and alignment of defences and details of policy delivery.
E4 05	Cockham Wood	Monitoring to examine present and future shoreline evolution under a policy of No Active Intervention.
E4 08	North Halling to Snodland	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; the combined effect of multiple realignments between Medway Bridge and Allington Lock; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 09	Snodland to Allington Lock	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; the combined effect of multiple realignments between Medway Bridge and Allington Lock; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 10	Allington Lock to North Wouldham	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; the combined effect of multiple realignments between Medway Bridge and Allington Lock; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 11	Wouldham Marshes	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 14	The Strand to West Motney Hill	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; potential contamination; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 15	Motney Hill to Ham Green	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 16	Ham green to East of Upchurch	Monitoring to examine present and future shoreline evolution under a policy of No Active Intervention.
E4 17	East of Upchurch to East Lower Halstow	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 18	Barksore Marshes	Further studies to investigate Managed Realignment and No

Policy Unit		Requirements
		Active Intervention i.e. future morphology of the estuary; potential contamination; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of delivery under Managed Realignment. Monitoring to examine present and future shoreline evolution under a policy of No Active Intervention.
E4 19	Funton to Raspberry Hill	Monitoring to examine present and future shoreline evolution under a policy of No Active Intervention.
E4 20	Chetney Marshes	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 22	Milton Creek	Further studies to consider the impact of groundwater extraction on the policy of hold the line.
E4 23	Murston Pits to Faversham Creek	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 25	Shell Ness to Sayes Court	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 26	Sayes Court to North Elmley Island	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 27	North Elmley Island to Knigsferry Bridge	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 28	Kingsferry Bridge to Rushenden	Further studies to investigate Managed Realignment i.e. future morphology of the estuary; potential contamination; the flood risk consequences of undertaking managed realignment; define the standard and alignment of defences and details of policy delivery.
E4 30	Medway Islands	Monitoring to examine present and future evolution of island habitats under a policy of No Active Intervention.

2.9 Habitats Regulations (Appropriate) Assessment

Regulation 48 of the Habitats Directive (92/43/EEC) requires that an Appropriate Assessment is undertaken for plans or projects that will have a significant effect on a European site (e.g. sites designated as SPA or SAC), where the plan is not directly associated with the management of the site. The Habitats Regulations Assessment (**Appendix J**) assesses the implications of the plan on these sites in order to identify the no damage or, if unavoidable, the least damage solution in respect of the conservation objectives of the European site's affected by this plan. The Thames, Medway and Swale Estuaries contain a significant coverage of European sites on both sides of the shoreline and

the Habitats Regulations Assessment generated many actions within the Action plan and places key constraints on how the SMP will be implemented.

2.10 Water Framework Compliance

A Water Framework Directive (WFD) assessment is provided in **Appendix L 'Water Framework Compliance'** of the SMP. This WFD-related assessment takes into consideration the potential effects of SMP policy options on the ecological quality elements of the water bodies directly affected by the SMP. The potential effects on ecological quality elements are associated with changes in hydrological regimes and water body morphology – including such factors as changes in current velocities, sediment accretion/erosion, water quality (turbidity, salinity) and tidal inundation. The WFD-related assessment also considers whether the SMP policies may have adverse consequences for water bodies protected under other EU legislation, in particular SPAs and SACs.

3 BASIS FOR DEVELOPMENT OF THE PLAN

3.1 *Historical Perspective*

The contemporary forms of both the Medway and Swale estuaries have been significantly influenced by anthropogenic activity over hundreds of years. The enclosure of former saltmarsh areas by construction of defences has taken place periodically since the Roman times. This has led to the existence of extensive areas of reclaimed land along much of the Medway and Swale shorelines. Land reclamation has led to a corresponding decrease in tidal prism and consequently both estuaries are experiencing contemporary net accretion overall, although erosion occurs in some locations.

The degree of future geomorphological change within the estuaries will be dependant on a change in driving forces such as sea level rise, storminess, increases in fresh water flows and the ability of the system to respond to these drivers. The ability of the system to respond therefore is in turn limited by constraints such as the underlying geology, available sediment supply and sea defences (i.e. position and standard of protection).

Although overall the estuaries are accreting at present, future increases in the rate of sea level rise and degree of storminess, coupled with the limited availability of sediments, mean that this accretion is likely to give way to erosion. The decision to be made now is how we are going to manage this change in the future.

3.2 *Sustainable Policy*

3.2.1 *Coastal Processes and Coastal Defence* **Climate Change**

The coastline is undergoing constant change due to large scale impacts of climate change, namely sea level rise, through to the day-to-day effects of waves and tidal currents. It is the implications of climate change that will determine sustainable shoreline management into the future.

Much of the present shoreline of the southern North Sea and the English Channel has been shaped by sea level rise during the Holocene period, i.e. following the last glaciation. Flooding of the southern North Sea and the English Channel commenced as sea levels rose. By approximately 8,000 years ago the entire English Channel, including the Dover Straits, was inundated. Shortly after, the shallow land separating this water body from the southern North Sea was breached, initiating a strong eastward current and sediment transportation in the eastern channel.

Sea level attained a level close to its present position around 5,000 years ago, and the modern hydrodynamic regime has been operating since this time. In the early stages of this period, the onshore migration of significant quantities of sediment led to major episodes of coarse sediment accumulation. This resulted in the formation of shingle barriers, that, rolled back to form the present shoreline and many of the present beaches. After sea level reached its present position, mudflats and saltmarsh began to form around the peripheries of estuary systems. These areas were later reclaimed by man for agricultural and industrial purposes.

Over the last 2,000 years sea level rise has continued, but at much lower rates resulting in ongoing, but less dramatic, changes at the shoreline. However, we are now entering a period of accelerating sea level rise, which will result in changes to the present coastal systems. Defra (2002) predicted that

sea level rise would increase from the present rate of 2mm/yr to 6mm/yr by 2105. Following the Third Assessment Report from the Intergovernmental Panel on Climate Change (IPCC) the figures have been revised (2006). The new allowances are highlighted below.

Table 3.1: Updated sea level rise predictions (Source: Defra, 2006)⁴

<u>Administrative or Devolved Region</u>	<u>Assumed vertical land movement (mm/yr)</u>	<u>Net Sea Level Rise (mm/yr)</u>				<u>Previous allowances</u>
		<u>1990-2025</u>	<u>2025-2055</u>	<u>2055-2085</u>	<u>2085-2115</u>	
<u>SE England</u>	<u>-0.8</u>	<u>4.0</u>	<u>8.5</u>	<u>12.0</u>	<u>15.0</u>	<u>6 mm/yr constant *</u>

* Updated figures now reflect an exponential curve and replace the previous straight line graph

Recent climate studies have indicated that there are significant changes occurring within our climate; with bigger storms, increasing rainfall and rising sea levels. The amount of physical change depends on the degree of exposure of each length of shoreline and the underlying geology. Increasing rainfall in-between longer periods of dryer weather can lead to increased fluvial flows in catchments and consequently increased potential for erosion of intertidal areas and pressure on defences within estuaries.

It is extremely important that the long-term plan in the SMP recognises these future issues and reflects likely future constraints to management planning. Thus the SMP acts as an early warning to those other plans and initiatives that are vital to the communities and infrastructure within the coastal / estuary zones.

Changes at the coast

The reclamation of extensive areas of former coastal lowland for agriculture and development has produced many areas where the shoreline is today artificially seaward of its natural position. Human intervention to construct embankments and drain the backing land for agricultural production, has created the large low lying areas of Grain marshes, Barksore Marshes, Chetney Marshes and marshes on the both the southern and northern banks of the Swale. Under natural circumstances these coastal frontages would have been inter-tidal or tidal habitats, were it not for the man made defences that now protect areas of freshwater and terrestrial habitats.

Sediment movement

Beaches, saltmarshes and low lying coastal floodplains provide a natural form of defence that react to storm waves; they do not prevent further erosion or flooding but do help to limit and control the rate and extent at which this takes place. They also form environmentally important habitats. On a naturally

⁴ Defra, 2006. Flood and Coastal Defence Appraisal Guidance, FCDPAG3 Economic Appraisal, Supplementary Note to Operating Authorities – Climate Change Impacts, October 2006.

functioning coastline, the alongshore movement of sediment eroded from cliffs or transported onshore from offshore, provides beaches and estuaries with material locally and further afield. A sustainable shoreline sediment system is one that is allowed to behave dynamically without any alongshore and cross-shore disruption due to coastal erosion and flood risk management.

However, defences constructed to protect developments and agricultural land along the SMP frontage have resulted in only limited sections of the shoreline being free to erode, providing little material to the estuary system. The most significant source of sediment to the Medway and Swale estuaries is the offshore supply of fine suspended material from the Greater Thames Embayment. Potential supplies also include relict sediments contained within saltmarshes, alluvium and sediment from London Clay cliffs within the estuary and along the open coast on the northern coastline of Isle of Sheppey. Previous work has assessed that sediment supply within the Medway estuary is expected to be sufficient to meet demand over the next 50 years but will be insufficient within 100 years and sediment supply within the Swale is expected to be sufficient to meet demand over the next 100 years⁵.

The extent of current defence structures means that significant lengths of the study shoreline today are generally in an 'unnatural' form and position. As such, much of the frontage would not necessarily revert to the 'natural' shoreline if we simply allowed defences to fail. Indeed, it is likely that for much of the SMP frontage, the removal or failure of defences would result in erosion and flooding of the backing land. On the large lengths of shoreline backed by low lying land this would cause inundation of the flood plain, creating a new shoreline and habitat in the process along the landward edge of the low lying area.

Defence impacts

Through the development of SMPs and strategy studies, there is often a public misconception that shoreline change can and should be halted through engineering works. There is often a demand to continue to hold the existing defence line to protect assets, but this is coupled with an expectation that the shoreline will continue to look exactly as it does now. However, the dynamic nature of our coasts and estuaries, mean that these expectations are incorrect in many, if not all, instances.

If we choose to continue to defend our shorelines in the same locations that we do at present, then the size of the defences will need to alter considerably. Defences will need to be wider to remain stable against bigger waves around the estuary mouths, have deeper foundations to cope with undermining and narrowing of intertidal areas, and be greater in height to limit the amount of water passing over the top of them in storms. Maintaining current defence lines within the estuary will also result in increased instances of coastal squeeze as sea levels rise. With high rates of sea level rise and low rates of sediment supply intertidal saltmarsh and mudflat habitats may suffer erosion where defences or high land constrain the landward movement of the shoreline. This is likely to lead to increased levels of wave and tidal energy impinging on defences, which will make them more expensive to maintain.

⁵ Centre for Coastal Management (CCM), 2002. *Saltmarsh Change within North Kent estuaries between 1961, 1972, 1988 and 2000*. Report produced by CCM at the University of Newcastle.

It must be recognised that, in the very long term, continuing to defend such long stretches of shoreline with increasing exposure and vulnerability may become technically and economically unsustainable. There is also greater risk associated with holding the line and continuing to occupy and develop the backing hinterland. Should inundation take place during an extreme event for example, where assets and lives are at risk, the need to relocate, or mitigate, for the increased risk to assets, should be considered in the future. Even where this point is considered to fall outside the SMP timescale (i.e. beyond 100 years), it is still very important to recognise that maintaining current alignments will not be possible indefinitely.

3.2.2 Economic sustainability

One of the difficulties facing us as a nation is the cost of continuing to protect shorelines to the extent that we do at present. Many of the defences that exist today have been the result of reactive management without consideration of the long-term consequences, including financial commitment.

Studies over the past few years have established that the cost of maintaining all existing defences is already likely to be at least 50% more than present expenditure levels. In simple terms this means that either more money needs to be invested in coastal defence, or defence expenditure has to be prioritised. Whilst it is more than likely that the first option would clearly be the preference of those living or owning land along the coast, this has to be put into context of how the general UK taxpayer wishes to see their money used. Given that the cost to provide defences that are both effective and stable currently averages between £3million and £5million per kilometre⁶, the number of privately owned properties that can be protected for this investment has to be weighed up against how else that money can be used, for example education, health and other social benefits.

Furthermore, because of the climate changes being predicted, these recent studies have also established that the equivalent cost of providing a defence will increase during the next century to between 2 and 4 times the present cost, excluding inflation or other factors, i.e. in excess of £6million to £10million per kilometre. Consequently those areas where the UK taxpayer is prepared to continue to fund defence may well become even more selective and the threshold when an area is no longer defended could well shift. Whilst it is not known how attitudes might change, it is not unreasonable to assume that future policy-makers will be more inclined to resist investing considerable sums in protecting property in high risk areas, such as the coast, if there are substantially cheaper options, such as constructing new properties further inland.

It is extremely important that the long-term policies in the SMP recognise these future issues and reflect likely future constraints. Failure to do so would not ensure future protection; rather it would give a false impression of a future shoreline management scenario that could not be justified and would fail to be implemented once funding was sought.

The implications of these national financial constraints are that protection is most likely to be focussed upon areas where there are large amounts of assets potentially at flooding or erosion risk, where the highest level of benefit would be achieved for the investment made, i.e. more properties could be protected per pound of investment. The consequence is that rural communities will often be more

⁶ Defra (2001) National Appraisal of Assets at Risk, from flooding and coastal erosion, including the potential impact of climate change.

affected, but from a national funding perspective, i.e. best use of the taxpayer's money, this makes economic sense.

It should be noted that, although the economic viability of the proposed policies has been assessed in this SMP, a proposed policy of Hold the Line or Managed Realignment does not guarantee funding for defence maintenance and / or capital works along these sections of the shoreline.

3.2.3 Environmental sustainability

Environmental sustainability is a concept that is frequently debated. As it depends upon social attitudes, which are constantly changing, it is therefore difficult to define. In the purest sense, however, environmental sustainability allows habitats to be self-perpetuating.

Historically, communities at risk from coastal erosion relocated, recognising that they were unable to resist change. However, in more recent times, many coastal defences have been built without regard for the impacts upon the natural environment. Today, because we have better technology, we are less prepared to accept change, in the belief that we can resist nature. Inevitably attitudes will continue to alter; analyses of possible 'futures' are already taking place (e.g. Foresight Future Flooding, 2004 and 'Making Space for Water'⁷), considering the implications for many aspects of life, including approaches to flooding and erosion under different scenarios. It is not possible to predict how attitudes will change in the future; therefore the SMP is based upon existing criteria and constraints, whilst recognising that these may alter over time to accommodate changing social attitudes. Some key uncertainties have been investigated in the Sensitivity Analysis (**Appendix H**).

Quality of life depends on both the natural environment and the human environment, which are discussed below.

Natural Environment

The forces of nature have created a variety of landforms and habitats along the Medway Estuary and Swale Estuary shorelines. The special quality of the natural habitats and geological / geomorphological features is recognised in a number of local, national and international designations, protected under statutory international and national legislation, as well as regional and local planning policies.

There is a legal requirement to consider the implications of any 'plan or 'project' that may impact on a Special Protection Area (SPA) or candidate Special Area of Conservation (cSAC), through the European Union Habitats Directive (Council Directive 92/43/EEC) and Birds Directive (Council Directive 79/409/EEC). The Defra High Level Target for Flood and Coastal Defence (Target 4 – Biodiversity) also requires all local councils and other operating authorities to:

⁷ Defra (2005a) Making Space for Water: Taking forward a new Government strategy for flood & coastal erosion risk management – Introduction. Available online at: <http://www.defra.gov.uk/envirom/fcd/policy/strategy.htm>

Defra (2005) Making Space for Water: Flood & Coastal Erosion Risk Management Innovation Fund. Project description available online at: <http://www.defra.gov.uk/envirom/fcd/policy/strategy/innovfnd.htm>

- Avoid damage to environmental interest;
- Ensure no net loss to habitats covered by Biodiversity Action Plans;
- Seek opportunities for environmental enhancement; and,
- Report progress in implementing actions that contribute to SSSI PSA Target and all losses and gains of habitats resulting from flood and coastal erosion risk management operations to the Environment Agency.

The EU Water Framework Directive⁸ also requires that water bodies such as estuaries reach at least 'good status' by 2015. A key requirement for the SMP is therefore to promote the maintenance or enhancement of biodiversity, through identifying biodiversity opportunities.

Coastal management can have significant impact on habitats and landforms, both directly and indirectly. In places, coastal defences may be detrimental to nature conservation interests, e.g. coastal squeeze of internationally designated intertidal habitats in front of defences. However, in other locations the presence of defences sustains, albeit temporally, the present interests of a site, e.g. freshwater habitats at Luddenham Marshes. However, one must recognise that the preservation of freshwater marshes may be at the 'expense' of alternative, more dynamic habitats i.e. saltmarsh. Coastal habitats may also form the coastal defence, e.g. the shell spit at Shell Ness. Therefore coastal management decisions need to be made through consideration of both nature conservation and risk management.

Although the conservation of ecological features in a changing environment remains key, in terms of environmental sustainability, future management of the coast needs to allow habitats and features to respond and adjust to change, such as accelerated sea level rise. It is recognised that coastal habitats cannot always be protected *in situ* because a large element of their ecological interest derives from their dynamic nature and this is important to ensure the continued functionality of any habitat. This poses a particular challenge for nature conservation and shifts the emphasis from 'preservation' to 'conservation'. Natural England (formerly English Nature) are actively seeking to ensure that coastal erosion and flood risk management proposals are designed to ensure that all designated sites are conserved and where possible enhancement opportunities that benefit ecology and geology are implemented, whilst also allowing the coast to remain naturally dynamic. Under Section 28G of the Countryside and Rights of Way Act 2000, government bodies have the responsibility and power to safeguard England's finest and most vulnerable wildlife and geological features. Therefore, accommodating the objectives of environmental bodies, such as Natural England, requires flexibility in the assessment of nature conservation issues, possibly looking beyond the designation boundaries to consider wider scale, or longer term, benefits.

The SMP also needs to consider opportunities for enhancing biodiversity throughout the SMP area, not just at designated sites. It has been identified that there are a significant number of biodiversity opportunities within this SMP area. These are where Managed Realignment has been proposed i.e. within the middle Medway Estuary and along both north and south banks of the Swale. There are other areas along this frontage where biodiversity opportunities can be taken. Incorporating localised

⁸ <http://www.defra.gov.uk/environment/water/wfd/index.htm>

realignment opportunities into Hold the Line policies is such an example e.g. along frontages in the inner Medway estuary Managed Realignment also serves to highlight where future development in the flood plain would be inappropriate. Both of these will however, need to be balanced against the socio-economic objectives for the area being considered.

Human (Socio-Economic) Environment

The human environment covers such aspects as land use (both current and future), heritage and landscape (which may be both natural and man-made).

Land-use:

Historically, development of the coast has taken place unconstrained. Planning Policy Guidance 20 (PPG20: Coastal Planning)⁹ identifies that approximately 30% of the coastline of England and Wales is developed, with much of this development taking place before the introduction of the Town and Country Planning Act 1947. Growth of built development, both commercial and residential, within the coastal zone over the centuries has increasingly required engineering works to defend properties and assets against the risk of erosion and flooding. However, continued construction of hard-engineered coastal and flood defences to protect development may not be economically sustainable in the long-term (see Section 3.2.2). Local Development Frameworks now identify the need for 'sustainable development' (section 39 of the recently reformed Planning and Compulsory Purchase Act, 2004); although the exact definition of this is uncertain, it recognises that opportunities for development on the coast are limited due to risk of flooding, erosion, land instability and conservation policies (as discussed above). PPG20 states that in the coastal zone, development plan policies should not normally permit development that does not require a coastal location. Planning Policy Statement 25 (PPS25: Development and Flood Risk)¹⁰ sets out the Government's policies for planning authorities to ensure that flood risk is properly taken into account at all stages in the planning process and to prevent and direct development away from areas at high risk of flooding.

The South East Plan (2006)¹¹ builds upon this, adopting a catchment wide approach to water management and acknowledging the links between biodiversity, water quality and flood and erosion risk management. Policies NRM6 (coastal zone management) and NRM3 (sustainable flood risk management), in particular, require local planning authorities to take account of Shoreline Management Plans, with the former advocating an integrated approach to coastal planning and management.

Thames Gateway, Europe's largest economic, social and environmental regeneration programme, extends along the southern banks of the Thames, through the Medway, to Sittingbourne and the Isle of Sheppey. Consequently a number of Thames Gateway regeneration projects are located within the

⁹ <http://www.planningportal.gov.uk/england/professionals/en/1021020428593.html>

¹⁰ <http://www.communities.gov.uk/index.asp?id=1504640>

¹¹ http://www.southeast-ra.gov.uk/southeastplan/plan/view_plan.html

SMP area, e.g. the Isle of Grain/Hoo Peninsular, Medway Waterfront, Chatham City Vision, Rochester Riverside, Milton, Kemsley and Sittingbourne.

A number of major commercial and industrial interests are located along this SMP shoreline e.g. power stations, container ports, and paper mills, as well as other major assets such as the Ports of Sheerness and Chatham and the large urban areas of the Medway Towns (Rochester, Chatham and Gillingham). The continuation of these industries and commercial activities is essential to sustain the economy of the region as a whole.

Tourism is relatively low in this area compared to other parts of Kent, however it still plays an important role and is valuable to the local economy. The area attracts visitors primarily to the estuaries' historic conservation areas (e.g. Rochester, Chatham Historic Dockyard and Queenborough) and to the landscape of the rural estuary environment (e.g. walkers, cyclists, photographers, birdwatchers).

The Medway and Swale estuaries form part of the Greater Thames Estuary, one of the busiest water recreation resources in the UK, hence water based recreation within the Medway and Swale estuaries is an important component to this resource. The estuary shorelines also represent an important recreational and amenity resource and the area attracts a diverse range of recreational pursuits in addition to water based activities, including: bird watching, wildfowling, walking and cycling.

Although assets landward of current defences, access routes to the shoreline and public rights of way may be protected through maintaining existing defences, it must be recognised that continuing such defence practices would in the longer term result in a significant alteration in the nature of the coast, with large concrete seawall structures and narrower intertidal areas.

Heritage:

Heritage features are valuable for a number of reasons (English Heritage, 2006)¹²:

- They are evidence of past human activity;
- They provide a sense of place (or roots) and community identity;
- They contribute to the landscape aesthetics and quality; and,
- They may represent an economic asset due to their tourism interest.

These assets are unique and if destroyed they cannot be recreated. Whilst they are vulnerable to any coastal erosion the very process of erosion is uncovering sites of historical interest. Only a few sites are protected by statutory law, but many more are recognised as being of high importance. Government advice in PPG15 (Planning and the Historical Environment)¹³ and PPG16 (Archaeology and Planning)¹⁴ promotes the preservation of important heritage sites, wherever practicable. However, due to the dynamic nature of our coastlines, this is not always possible, or sustainable. Therefore each site must be considered individually and balanced against other objectives at that location.

¹² English Heritage (2006) Shoreline Management Plan Review and the Historic Environment: English Heritage Guidance.

¹³ <http://www.planningportal.gov.uk/england/professionals/en/1021020427913.html>

¹⁴ <http://www.planningportal.gov.uk/england/professionals/en/1021020427943.html>

The long maritime history of this part of the South East coastline has resulted in a large number of important heritage sites, and areas with heritage potential, being present. Major heritage features include historic fortifications, harbours and dockyards, military installations, coastal settlements and industry. However, there are a great many other features which shoreline management policy could potentially affect, such as the preserved artefacts contained in buried landscapes.

Landscape:

Parts of the SMP shoreline are designated and protected for their landscape quality as Areas of Outstanding Natural Beauty, Special Landscape Areas and Character Areas. However, in general, landscape is difficult to value objectively as it is a mixture of the natural environment and social and cultural history. Therefore defining a sustainable landscape is usually dependent upon the human and natural environment factors discussed above.

4 THE PREFERRED PLAN

4.1 *Plan for Balanced Sustainability*

The SMP is built upon seeking to achieve balanced sustainability, i.e. it considers people, nature, historic and economic realities.

The preferred policies proposed for the present-day provide a high degree of compliance with objectives to protect existing communities against flooding and erosion. The proposed long-term policies promote greater sustainability for parts of the shoreline where natural process and evolution provide a practical means of managing the shoreline. However, the protection of the significant assets present along sections of the shoreline remains a strong focus for the long-term sustainability of the economy and communities of this area.

The rationale behind the preferred plan is explained in the following sections of text, which consider the SMP area as a whole. This is presented in five sub-sections which broadly reflect differing processes and risks within the two estuaries; the outer Medway Estuary (**Section 4.1.1**); the middle Medway Estuary (**Section 4.1.2**); the inner Medway Estuary (**Section 4.1.3**); the outer / middle Swale Estuary (**Section 4.1.4**) and the inner Swale Estuary (**Section 4.1.5**). Details of the preferred policies for individual locations to achieve this Plan are provided by the individual Policy Unit statements in Chapter 5.

4.1.1 *Medway – Outer Estuary (Isle of Grain and Sheerness)*

The constrained mouth of the River Medway joins the open coast between high land on the Isle of Grain on the mainland, and Sheerness, located at the north-western extent of the Isle of Sheppey. As such, there are interactions between open coast and estuarine processes in this location. The constrained ebb dominant channel is bordered by relatively narrow and steep mudflats, which, around the Isle of Grain, are internationally designated.

Both the western and eastern shorelines of the outer estuary are heavily defended, providing protection from erosion and flooding to nationally important industry, commercial activity and infrastructure on both the mainland and the Isle of Sheppey. There is very strong justification for seeking to prevent erosion and inundation of these particular frontages and the consequent increased risk to assets and services. However, ongoing sea level rise will result in further narrowing of designated intertidal habitats with coastal squeeze. It is envisaged that these management practices will continue along these frontages over the next 100 years, although decommissioning of the Power Station or the reduced importance of commercial activity on the Isle of Grain, would allow some realignment on this frontage in future revisions of the SMP.

4.1.2 *Medway – Middle Estuary (Colemouth Creek and Chetney Marshes to the Medway Towns, including the Medway islands)*

The flood dominant middle Medway estuary is overly wide with extensive intertidal areas and is designated for its 'industrial' and 'natural' estuary landscape value.

The estuary is wider than the ideal form in the middle estuary and consequently a large area of saltmarsh (Stoke Saltings) has developed between Colemouth Creek and Kingsnorth Power Station, linking the two important industrial areas. The internationally designated saltmarsh, which is currently accreting, provides additional natural protection to the associated infrastructure which skirts the

frontage. Significant defence structures around Kingsnorth Power Station provide protection from erosion and flooding to the nationally important industrial area. The implementation and future review of SMP policy in this area should pay attention to the proposal of a new larger power station on the site. However, ongoing sea level rise will result in further narrowing of designated intertidal habitats with coastal squeeze. It is envisaged that this management practice will continue along the Power Station frontage over the next 100 years, although decommissioning of the Power Station would mean the policy could change in future revisions.

Wide intertidal mudflats and saltmarsh of international importance continue to extend along the frontage towards Hoo St Werburg. Apart from the industrial areas, the hinterland predominantly comprises undeveloped coastal grazing marsh (some of which is also internationally designated) and agricultural land with a number of small residential communities located on higher land. Along part of this frontage, south-east of Hoo St Werburg, a proposal has been put forward for a mineral extraction operation and habitat restoration project.

West of Hoo marina, undeveloped coppice at Cockham Wood extends along the shoreline to Lower Upnor. The wood extends over soft clay cliffs, each of which are of national biological and geological importance respectively. The woodland, also designated for its landscape value, is fronted by narrow areas of grass, beach and then intertidal mudflat. The only built asset along this frontage is Cockham Wood Fort, a nationally important heritage asset, parts of which are being actively eroded by the river. Protection of the heritage feature has been ruled out as it is considered unsustainable and uneconomic in the long term. This section of shoreline is undefended and is currently managed under a policy of No Active Intervention. It is therefore envisaged that this management practice will continue in this location over the next 100 years to maintain landscape value and to allow the continuation of natural shoreline evolution.

The area of frontage between Chetney Marshes and Gillingham is largely undeveloped with the exception of a number of scattered villages, e.g. at Lower Halstow, Upchurch, Otterham, Lower Rainham and Lower Twydall. The area is important agriculturally (with extensive orchards and valuable Grade 1 agricultural land) and for land based recreation (Riverside Country Park, RSPB and Local Nature Reserves, Saxon Shore Way and numerous locations for bird watching and wildfowling). Large areas of low-lying coastal grazing marsh and freshwater habitat at Chetney Marshes, Barksore Marshes and Horsham Marsh are nationally and internationally designated. A range of policies have been proposed along this frontage (see individual policy unit statements).

A local road runs along the frontage between Funton and Raspberry Hill. At present this frontage is defended, however the road floods during long heavy periods of rainfall and high tidal levels. Continuing to defend this section of shoreline is deemed unsustainable and uneconomic in the future. With the implementation of No Active Intervention it is envisaged that the initiation of natural shoreline realignment and uncontrolled flooding will render the road unusable within approximately 50-100 years. As such, it is noted that the road will become inoperable at some point within the next century. This fact is accepted by the Highways Agency and, in due course, consideration will need to be given to management of this loss. Mirroring the northern areas of the middle Medway estuary, the estuary is wider than its ideal form in this location and consequently large mudflat and saltmarsh areas and saltmarsh islands have developed, all of which are internationally designated for their environmental importance. Nationally significant Scheduled Monuments are located on Hoo Saltmarsh Island (Hoo Fort SM), which is also a dredging disposal site, and Darnet Ness (Darnet Fort SM). Nor Marsh Island forms part of Nor Marsh and Motney Hill RSPB Reserve. The intertidal areas are expected to remain

stable over the next 50 years, as the sediment budget is expected to be sufficient to meet demand, but could go into deficit after this time, rendering intertidal areas more susceptible to erosion with coastal squeeze. The implementation of a No Active Intervention policy for the islands is considered appropriate to allow the continuation of natural erosion and periodic inundation of the islands. It is considered unsustainable and uneconomic to protect the individual heritage features in the long term. An ongoing monitoring programme is recommended to assess the future management needs of the islands.

These factors mean that the only practical solution to long term management of the middle estuary is to maintain the current shoreline along parts of the frontage (to protect valuable assets) and to seek opportunities for Managed Realignment and No Active Intervention along discrete sections (on both northern and southern banks), to enable future 'flexibility' of the shoreline as sea levels rise. A policy of Managed Realignment in discrete locations will maintain the important environmental and landscape values in these areas, and help reduce future effects of coastal squeeze, thus providing the most sustainable form of coastal management for this shoreline.

4.1.3 Medway – Inner Estuary (Medway Towns to Allington Lock)

The ebb dominant, highly sinuous, narrow channel with limited intertidal areas extends from the dense urban areas of the Medway Towns in the north to the southern tidal limit at Allington Lock.

The northern section of the inner estuary is characterised by heavily defended shorelines protecting a significant number of residential, commercial, recreational and heritage assets, connected by regionally important strategic links. This area is important not just commercially but for its heritage importance, where many visitors are attracted to the proposed World Heritage Site at Chatham Historic Dockyard. Under the preferred long-term plan the Medway Towns (Rochester, Chatham and Gillingham) and the urban centres of Frindsbury and Strood will continue to be protected to maintain assets. This is likely to lead to the continued erosion and deepening of the narrow channel. As sea levels rise and fluvial flows increase defences in this area will become subject to increased pressure, with defences becoming more exposed to undermining and overtopping.

South of the Medway Bridge the landscape changes to that of a meandering river valley with villages interspersed with agricultural land, freshwater marshes and lakes leading to increasingly urban and industrial areas to the south towards Allington Lock.

The plan to allow and seek further opportunities for Managed Realignment between the Medway Bridge and Allington Lock will allow for more sustainable and flexible estuary management in the future. While important assets remain defended, Managed Realignment in discrete locations will maintain the important environmental and landscape value of these areas by creating important brackish and saline habitats and allow natural meandering to re-commence in some sections. Set-back defences may also provide opportunities for flood storage areas upstream and help reduce pressure in confined sections of the inner estuary. Further studies will be required to investigate the 'in combination' effect of multiple areas of realignment in the upper reaches of the Medway estuary and to define the exact standard and position of any realigned defences along these frontages.

4.1.4 Swale – Middle and Outer Estuary (Kingsferry Bridge to Shell Ness and Faversham Creek)

The Swale is an 18.4km¹⁵ channel that separates the Isle of Sheppey from mainland Kent. It is unusual in having two mouths, one to the west at Queenborough, connecting the Swale with the Medway Estuary (Inner Swale Estuary), and the second to the east where the mouth joins the open coast at Shell Ness. As such there are interactions between open coast and estuarine processes at the eastern mouth. Freshwater inputs come from a series of smaller creeks on the southern bank i.e. Faversham, Oare, Conyer and Milton Creeks which drain from the North Downs.

The southern bank of the middle and outer Swale extends from Kingsferry Bridge in the west to Nagden in the east, which forms the boundary with the adjacent Isle of Grain to South Foreland SMP2. South of Kingsferry Bridge is an important industrial area which includes docks, a paper mill and other industry at Kemsley. The importance of the industry combined with essential infrastructure along the frontage (i.e. A249 road, railway line, electricity sub-station and associated pylons) means that a Hold the Line policy is justifiable in this location to provide protection against flooding and erosion.

The towns of Sittingbourne and Faversham and the villages of Conyer and Oare are located at the southern extremities of Milton, Faversham, Conyer and Oare Creeks respectively. The historic towns of Sittingbourne and Faversham provide regionally important centres supporting a wide range of residential, commercial and industrial activities that service other communities in the area. As such, there is strong justification for seeking to prevent erosion and flooding of these particular frontages and the consequent increased risk to properties and services. As sediment supply within the Swale Estuary is expected to continue to meet demand over the next 100 years, intertidal habitats along both Milton and Faversham Creek are expected to remain stable.

The majority of shoreline between Milton Creek and Faversham Creek is of considerable environmental interest, as both the low lying agricultural marshland and fronting tidal mudflats and saltmarsh are internationally designated. The large floodplain, which also includes parts of Sittingbourne and Faversham, extends to higher land in the south. These factors, along with the importance and value of the range of assets within the flood risk area, mean that the only practical solution to management of this frontage is to maintain the current shoreline alignment where assets warrant long term protection (i.e. Sittingbourne, Conyer, Oare and Faversham) and realign defences in a set-back position along the remaining frontage. A policy of Managed Realignment in discrete locations will maintain the important environmental and landscape values in these areas, and help reduce future effects of coastal squeeze, thus providing the most sustainable and flexible form of coastal management for this section of shoreline.

The northern shoreline of the Swale encompasses the south of the Isle of Sheppey, an extensive low lying frontage extending between Kingsferry Bridge in the west and Shell Ness in the east, which forms the boundary with the adjacent Isle of Grain to South Foreland SMP2. The area, having experienced extensive reclamation in the past, is characterised by secondary embankments criss-crossing freshwater marshes and grazing land before rising to higher land in the north. Broad expanses of internationally designated freshwater habitat, fronted by accreting areas of saltmarsh

¹⁵ Joint Nature Conservation Committee (JNCC), 1997. *An inventory of UK estuaries*. 5. Eastern England.

(which are also internationally designated), are separated by two small areas of higher ground (i.e. Isle of Harty and Elmley Island) formed as a result of underlying more-resistant London Clay deposits. These areas of high land provide natural boundaries for separating policy units along this frontage. The low-lying hinterland, which if flooded, has the potential to inundate up large areas of environmentally designated agricultural land. Land behind existing defences is generally lower than the fronting intertidal areas, and is significantly lower than mean Spring tide levels.

Given the extent of land at risk however, it is considered imperative that flexible flood defence management is employed to manage the environmental assets responsibly and sustainably over the next 100 years. It is proposed to promote realignment along the low lying frontage. Realignment is possible here as the flood plain is relatively sparsely populated, and there is higher ground to which a secondary defence alignment could be tied into in places, limiting the extent of potential flood propagation. This approach will reduce the long term defence requirement by utilising higher ground where practicable, in combination with shorter defence lengths. The alignments of secondary defences to limit flooding have not been defined by the SMP, but to achieve the benefits of allowing the shoreline to realign it is anticipated that there would be a managed change of some freshwater habitats. Further studies will be required to investigate potential Managed Realignment extents.

The one other notable environment present on the Isle of Sheppey is that of the shell and sand spit at Shell Ness. This relic feature, actively managed toward the open coast, provides a natural addition to flood protection at the eastern mouth of the Swale. Under rising sea levels it is anticipated that it will become increasingly difficult to maintain the beach along this frontage. Coastal squeeze together with a diminished supply of natural beach building sediment offshore would lead to increased erosion if the current alignment were to be held in the long-term. It is proposed to construct defences set back from the current coastline, to allow some natural reorientation of the shoreline. This would reduce the need for new defence works or beach management measures, possibly creating cost savings and environmental enhancements.

4.1.5 Swale – Inner Estuary (Kingsferry Bridge to Queenborough)

The inner Swale Estuary comprises a narrow canalised channel which extends from the Kingsferry Bridge in the south, to the estuaries' second mouth at Queenborough, where it connects to the Medway Estuary. The estuary is very narrow along this frontage and consequently intertidal areas are minimal. These Intertidal habitats are internationally designated for their environmental importance, along with a small section of freshwater marsh immediately north of the Kingsferry Bridge. Although these intertidal areas are expected to remain stable over the next 100 years, as the sediment budget is expected to be sufficient to meet demand, intertidal habitats will become increasingly susceptible to erosion due to coastal squeeze as sea levels rise.

The towns of Rushenden and Queenborough, located towards the western Swale mouth, are two important residential and commercial areas as well as being recognised for their future development potential and national heritage importance respectively. It is considered that the continued management of inundation and flood and erosion risk to assets in these locations is economically justified and environmentally acceptable, although ongoing sea level rise will result in further narrowing of designated intertidal habitats with coastal squeeze.

The only practical solution to long term management of the inner estuary is to maintain the current shoreline along parts of the frontage (i.e. to protect valuable assets at Rushenden and Queenborough) and to seek opportunities for Managed Realignment along southern sections of this frontage (i.e.

between Kingsferry Bridge and Rushenden), to enable future 'flexibility' of the shoreline as sea levels rise. A policy of Managed Realignment in discrete locations will maintain the important environmental and landscape value of these areas, and help reduce future effects of coastal squeeze, thus providing the most sustainable form of coastal management.

A return to a more natural functioning shoreline, promoted in the southern half of this frontage, will allow the shoreline to re-orientate to a realigned position, with the formation of brackish and saline habitats. Dependant upon the alignment of set back defences, this will involve the long term inundation and displacement of areas of freshwater habitat. Further studies will however be required to investigate potential contamination issues with a Managed Realignment policy at the Rushenden Disposal Site, before any change of policy is initiated at this location.

4.2 Predicted Implications of the Preferred Plan

Direct comparison is made below between the preferred plan / policies and a No Active Intervention approach; this being the position if no money was spent on coastal defence i.e. if nothing was done. This approach defines the benefits of implementing the plan, as it highlights what would be lost under No Active Intervention against what would be gained if the preferred policy was implemented. Where No Active Intervention is the preferred policy then obviously this methodology is not required.

4.2.1 Implications for property and land use

For urban and industrial areas of the SMP shoreline the recommended plan is to maintain existing defences where it is economically viable, to do so, in the long term. This is to minimise risk to property and assets along the extensively developed sections of the estuaries. However, for some significant sections of the shoreline, a change in management policy has been identified in the longer term where a long term Hold the Line policy will not be economically viable, technically sustainable, or environmentally acceptable. In these locations policies of No Active Intervention or Managed Realignment need to be considered. The SMP has identified areas where a more naturally functioning coastline would be to the benefit of the natural environment and to estuarine processes. However, there would be potential changes to land and environmental assets should these policies be implemented.

For the proposed recommended plan, the maximum number of built assets lost to erosion by year 2105 would potentially be 4 (3 heritage assets, 1 residential and 1 commercial building). This compares to the No Active Intervention baseline where, erosion losses throughout the SMP frontage could total 101 residential, 24 commercial properties and 3 heritage assets. Consequently the plan provides for protection from erosion to over 100 properties over the next 100 years.

The above figures only relate to losses through shoreline erosion. In addition, there are vast numbers of assets that could potentially be at risk from inundation under No Active Intervention policies on the flood risk frontages. These include around 170 properties on and around the Isle of Grain, 160 properties around Kingsnorth, 4,200 properties in the Medway Towns (Strood, Frindsbury, Chatham, Rochester and Gillingham), 1,350 properties between Medway Bridge and Allington Lock, 180 properties between Gillingham and Kingsferry Bridge, 4,300 properties in the Sittingbourne and Faversham areas and 8,200 properties on the Isle of Sheppey (Sheerness, Queenborough, Rushenden and Shell Ness). This gives a total of around 18,560 properties that could potentially be lost due to permanent or frequent inundation. Under the recommended policies the great majority of these assets will be protected, although a Managed Realignment option at Shell Ness (in conjunction

with a Managed Realignment policy along the adjacent open coast – Policy Unit 4a 06 Leysdown-on-Sea to Shell Ness) will result in increased flood and erosion risk to properties.

Agriculture represents an important part of the local economy and along the estuary shorelines there are various grades of agricultural land. Some areas of agricultural land will be exposed to coastal flooding and erosion under Managed Realignment or No Active Intervention policies. It should be noted that degree of exposure will be dependant on the extent of Managed Realignment, which will be subject to further studies following the SMP.

Major infrastructure in the SMP area, including major roads, railways and other transport links, the Ports of Chatham and Sheerness, and power stations at Kingsnorth and Grain, will continue to be protected under the recommended policies. A No Active Intervention policy between Funton and Raspberry Hill will, however, result in the loss of a small local road as it is considered unsustainable and uneconomic to continue to protect the road in the long term.

4.2.2 Implications for nature conservation

The low lying areas along this frontage are notable for their freshwater habitats, which are covered by Local and National BAPs and much of which are designated as being internationally or nationally important. The proposed long term realignments in locations around the Medway and Swale estuaries would displace some SPA and Ramsar designated freshwater habitats. However, the creation of important brackish, intertidal and saltmarsh habitats and the promotion of a ‘naturally functioning’ shoreline under this policy provide important nature conservation benefits i.e. improving the existing habitats and creating new, dynamic habitats. Effects on European designated sites will This will need to be managed in line with the Habitats Regulations Assessment (**Appendix J**) and the Regional Habitat Creation Programme (RHCP). The tables overleaf summarise the key habitat management requirements for the plan.

Table 4.1 European Habitat Balance Sheet

Epoch (yrs)	Greater Thames CHaMP Intertidal Losses in SMP area (Ha)	SMP Intertidal (MR) in Undesignated areas (Ha)	SMP Intertidal Gains (MR) in Designated areas (Ha)	SMP Designated Freshwater Displacement (Ha)	RHCP Intertidal Habitat Compensation for SMP (Ha)	RHCP Freshwater Habitat Compensation for SMP (Ha)
0-20	370	<113	257<370	-257<-370	0	370
20-50	+ 295	+32	+295	-295	0	+295
50-100	+1035	+0	+435	-195	<600 (tbc)	+195
TOTAL	<u>1700</u>	<u>145</u>	<u>987<1100</u>	<u>860</u>	<u><600 (tbc)</u>	<u>860</u>

Table 4.2 Potential RHCP Freshwater Compensation Areas

Epoch (yrs)	Location	Habitat	Cumulative Habitat Area (Ha)
0-20	Rank 1 – North Swale	Grazing Marsh & Standing Water	370
20-50	Rank 2 - South Swale		665
50-100	Rank3 - Hoo St. Werburg		860

Table 4.3 SSSI & BAP Habitats

Habitat	BAP (y/n)	BAP (Ha)	SSSI (Ha)	BAP& SSSI	Comp(y/n)	Compensation Req'd. (Ha)
Broadleaved woodland - semi-natural	y	0.7	0.0	0.7	y	0.7
Scrub - dense/continuous	n	0.0	3.7	3.7	y	3.7
Neutral grassland - semi-improved	y	32.3	21.5	53.8	y	53.8
Calcareous grassland - semi-improved	y	0.0	0.8	0.8	y	0.8
Marsh/marshy grassland	y	1.9	0.0	1.9	y	1.9
Other tall herb and fern - ruderal		0.0	1.4	1.4	y	1.4
Swamp	y	11.7	9.9	21.6	y	21.6
Standing water	y	1.9	0.2	2.1	y	2.1
Running water	y	0.0	1.0	1.0	y	1.0
Intertidal - mud/sand	y	0.5	1.3	1.8	y	1.8
Saltmarsh - dense/continuous	y	0.8	4.1	4.9	y	4.9
Cultivated/disturbed land - amenity grass	n	0.0	0.4	0.4	y	0.4
Cultivated/disturbed land - ephemeral	n	0.0	1.1	1.1	y	1.1
Unknown	n	0.0	9.9	9.9	n	0.0
BAP Compensation		<u>49.7</u>				
Holborough Marshes SSSI Compensation			<u>55.4</u>			
TOTAL Compensation						<u>95.3</u>

In areas where the proposed recommended plan is to Hold the Line, built assets and environments behind defences will continue to be protected as sea levels rise. Localised intertidal areas will, however, become increasingly subject to erosion due to coastal squeeze with increased water levels and fluvial flows. However, these will be countered by habitat growth within the middle reaches of the estuary and these recommended policies are therefore deemed technically and environmentally viable, for the duration of the Shoreline Management Plan.

Nationally designated undeveloped coppice and soft cliffs at Cockham Wood are currently undefended. The proposed No Active Intervention policy at Cockham Wood will continue to allow the

shoreline to function and evolve freely, maintaining its landscape value and natural evolution of this shoreline.

The relic shell and sand spit at Shell Ness will continue to provide a degree of natural flood protection at the eastern mouth of the Swale. However, under the proposed plan to construct set back defences, the spit will be allowed to reorientate naturally as sea levels rise.

4.2.3 Implications for landscape

The area around Wouldham Marshes is designated under the North Kent Downs Area of Outstanding Natural Beauty (AONB), whilst many other sections of this coastline are recognised and protected for their landscape quality through various Character Areas and the North Downs and North Kent Marshes Special Landscape Areas. There are also many areas designated as being of 'local' landscape value.

The recommended long-term plan for the SMP is to sustain the current urban areas through proactive management of the existing defences, recognising that defences will be need to be upgraded in the long term. However, opportunities for forming a less managed / free functioning dynamic shoreline in other areas have been taken to create a more natural estuary landscape, reducing the extent of man-made structures along the frontages. This is deemed to provide a more sustainable and aesthetically appealing landscape than a policy of defending the whole estuary, which would involve construction of new, more substantial defences.

In general, the plan will maintain the landscape quality of the majority of frontages.

4.2.4 Implications for the historic environment

The Medway and Swale estuaries enjoy an abundance of archaeological and heritage sites resulting from their rich and varied cultural heritage, maritime trading links and historic fortifications and defences; many of which are located on or adjacent to the shoreline.

Those assets along sections of the estuary where defences will be maintained and improved will be protected in the long term. Significant protected features include the following Scheduled Monuments (SMs); coastal artillery defences on the Isle of Grain, Upnor Castle, Temple Manor, Bishop's Palace at Halling, Aylesford Bridge, Chatham Dockyard, Oare Gunpowder Works, Castle Rough, Sayes Court, Queenborough Castle and Sheerness Defences. There are also many unscheduled sites of importance that are protected, along with areas of archaeological potential. Many listed buildings and Conservation Areas within the urban areas will also be protected under the recommended plan.

However, the policies which promote long term realignment will invariably impact upon the historic environment, as the coverage of the coastal heritage resource is so extensive. Managed Realignment proposed throughout both estuaries will potentially result in an increased risk to unknown buried heritage features. These increased risks under the recommended long term plan for this SMP, must be recognised and consideration should be given to an appropriate programme of survey, recording and investigation to record these important sites, and those potential features not yet identified.

The proposed policy of continued No Active Intervention at Cockham Wood and for the Medway Islands will result in erosion of, and in the long term, an increased risk to, three SMs; Cockham Wood Fort (Cockham Wood), Hoo Fort (Hoo Saltmarsh Island) and Darnet Ness Fort (Darnet Ness). It is considered unsustainable and uneconomic to protect these three heritage features in the long term.

4.2.5 Implications for amenity and recreational use

The Medway and Swale estuary shorelines are an important area for tourism and recreation use. This SMP shoreline is extensively covered by coastal footpaths, including the Saxon Shore Way (Hoo St Werburg to Frindsbury; Rochester to Kingsferry Bridge and along the southern shore of the Swale) and the Medway Valley Walk (Rochester to Allington Lock). Sections of these footpaths will be lost at varying times along frontages where No Active Intervention or Managed Realignment are proposed. However, where these policies are proposed, there is potential for footpaths to be realigned as the shoreline realigns and / or when defences are realigned.

Where the shoreline is allowed to realign there will be potential access issues, with existing access routes often being lost, e.g. on the south and north banks of the Swale. However in some places it will be a necessity for these to be re-established, due to health and safety obligations.

4.3 Managing the Change

The long term management of the shoreline is important. Continuing with current practices of defence is unsustainable for some frontages, and policies must change to reflect the economic justification and sustainability of each particular frontage unit.

The consequences of these changing policies will need to be managed at various levels of planning and government. The issues that have been identified by this plan are not limited to this shoreline and will be common to many other areas around the UK. At this time, the UK Governments' 'Making Space for Water' is considering a number of these issues¹⁶.

4.3.1 Recommendations

Achieving this plan may require changes in planning and policy at local, regional and national government levels. Regional planning needs to consider the messages being delivered by this Plan, and ensure that future proposals for regional development and investment are made accordingly. Such planning needs to be looking beyond the current 20 year horizon.

Local Development Planning should consider the risks identified in this plan and avoid approving inappropriate development in areas at risk of flooding and erosion. Local Development Planning also needs to consider that relocation of displaced people and property may require land to be made available within the same settlements, in order to maintain the same level of community and may need to become increasingly flexible to enable this. Locations for new developments may need to be identified.

Environmental bodies will have to make some difficult decisions in developing a long-term vision for a dynamic coastal environment. However, in the short-term there is the need to ensure that conservation interests within designated sites, or in the wider environment, are appropriately addressed by coastal and estuarine management. The findings of the **Habitats Regulations Assessment** will be fundamental to the implementation of the SMP. In order for long-term solutions to

¹⁶ Defra, 2005a. Making Space for Water: Taking forward a new Government strategy for flood & coastal erosion risk management – Introduction. Available online at: <http://www.defra.gov.uk/enviro/fcd/policy/strategy.htm> and <http://www.defra.gov.uk/enviro/fcd/policy/strategy/innovfnd.htm>

be sought, public and local communities should be involved. Natural England published a Maritime Strategy entitled 'Our Coasts and Seas: making space for people, industry and wildlife' (available from the English Nature website¹⁷) to help deliver this.

Where policies may result in an increased risk to property and assets, whether due to coastal erosion or flooding, the effect on property owners should be managed through exit strategies. These will need to address the removal of buildings and other facilities well in advance of any loss. The plans for relocation of people also need to be established as does the basis on which mitigation should be funded. However, mitigation measures do not fall solely upon national and local government, and should not be read as such within this plan. Business and commercial enterprises will need to establish the measures that they need to take to address the changes that will take place in the future. This includes providers of services and utilities, which will need to make provision for this long-term change when upgrading or replacing existing facilities in the shorter term. They should also consider how they will relocate facilities that will become lost to erosion or flooding, and the need to provide for relocated communities. Other parties needing to consider mitigation measures will be the local highways authorities and bodies responsible for local amenities (including churches, golf clubs etc).

Private land and property owners will need to consider how they will deal with changes to the shoreline that affects their property. Currently maritime authorities have 'permissive powers' to undertake coastal flood and erosion works, there is no obligation for the operating authorities or national government to assure protection against flooding or erosion. Similarly, there is no reason, at present, to assume that this will change in the future or that individual losses would be compensated from central funds.

However, the preferred Plan provides a long lead-in time for the changes that will take place at some point in the future, as advised by the Action Plan. This will allow those parties that are affected by the plan to adjust accordingly. To manage these changes effectively and appropriately, the approach put forward in the SMP needs to be considered now, not in several decades time.

¹⁷ www.english-nature.org.uk

5 POLICY STATEMENTS

5.1 Introduction

This chapter contains a series of statements presenting the preferred policy and implications for individual locations. These provide local detail to support the SMP-wide preferred plan, presented in **Chapter 4**, and consider locally-specific issues and objectives, which are presented in the **Annex** to this document. Consequently, these statements must be read in conjunction with those and in the context of the wider-scale issues and policy implications as reported therein.

5.2 Content

Each Policy Statement contains the following:

Policy Unit/Location reference This provides the general name used for reference to each policy unit and the number identifier which is sequential along the shoreline from east to west or clockwise direction (numbering is based upon the sub-cell number E4 followed by a unit number).

Proposed Preferred Plan This is a statement summarising the preferred plan and describing the rationale behind it. These focus upon the long-term plan but also note any different short-term requirements.

Preferred policies to implement the plan This describes the policies and activities that will be undertaken in the short, medium, and long-term to implement the preferred plan. In this respect, “Present day policy” is broadly representative of the next 20 years, “Medium term policy” 20 to 50 years, and “Long term policy” 50 to 100 years. These timescales should not be taken as definitive, but should instead be considered as phases in the management of a location.

If a policy of ‘Advance the Line’ or ‘Managed Realignment’ occurs in the short or medium term, it automatically remains the same for remaining term of the plan, this does not necessarily mean that there will be further changes in defence alignment. For example, if the SMP recommends a managed realignment policy in the short term, the policy will remain managed realignment in the medium and long-term too although it is likely there would be only one change in alignment within the life of the plan.

Predicted Implications of the recommended plan for this location This Table summarises the consequences *at this location only* resulting from the preferred policies. These are categorised as “Management activities”, “Property, Built Assets & Land Use”, “Nature Conservation”, “Landscape”, “Historic Environment” and “Amenity & Recreational Use”, and correspond with information being entered into the national database of SMPs. The implications have been assessed for the situation in terms of each epoch: short (present to 2025), medium (2025 to 2055) and long term (2055 to 2105), again to provide a nationally consistent picture.

5.2.1 Policy Units

Based upon the preferred scenario, Policy Units are identified representing frontages for which a discrete shoreline management policy applies. These are divided to reflect changes in policy over time, and significant differences in policy implications. Figures 1.3 and 1.4 show the full plan area, and identify the subdivision into Policy Units.

The following list identifies the Policy Units for which statements are provided, together with a brief summary of the characteristics that define the Unit, and the page number on which the full statement can be found:

Policy Unit		Description	Page No.
E4 01	Grain Tower to Colemouth Creek	A small narrow shingle beach is located to the north of Grain Tower fronted by wide tidal mudflats; elsewhere intertidal habitat to the east and south of the frontage is internationally designated. Grain village is located on an area of higher land to the north while the majority of the shoreline is dominated by nationally important industry and infrastructure.	48
E4 02	Colemouth Creek to Bee Ness Jetty	A large area of saltmarsh fronts nationally important infrastructure and the residential communities of Lower Stoke and Middle Stoke. The extensive intertidal and some sections of freshwater habitat are internationally designated.	53
E4 03	Kingsnorth Power Station	The nationally important Power Station and associated infrastructure dominates this frontage. Jetties from the Power Station stretch out into the estuary and extend over a number of small islands. The wide intertidal mudflats and saltmarsh along the frontage, including Oakham Marsh Island are internationally designated.	58
E4 04	Power Station to Cockham Wood	Apart from a marina and the residential community of Hoo St Werburg to the west, the frontage mainly comprises low-lying undeveloped agricultural land and coastal grazing marsh, some areas of which, like the wide intertidal habitats along the frontage, are internationally designated.	63
E4 05	Cockham Wood	Undeveloped coppice at Cockham Wood extends along the shoreline and over soft clay cliffs, each of which are of national biological and geological importance respectively. The woodland, used as a recreational amenity, also designated for its landscape value, is fronted by narrow areas of grass, beach and then intertidal mudflat. The only built asset along this frontage is Cockham Wood Fort, a nationally important heritage asset, parts of which are being actively eroded by the river.	69
E4 06	Lower Upnor to Medway Bridge	A dense urban area extends to the shoreline along the majority of the unit, predominantly consisting of the residential areas of Frindsbury and Strood, the commercial and industrial area of the Medway City Estate and regionally important strategic links. The eastern section of frontage is less densely urbanised and is made up of smaller residential areas interspersed with recreational and nationally important heritage features.	72
E4 07	Medway Bridge to North Halling	The railway line closely follows the shoreline along this frontage, separating the 'fluvial' estuary channel from the residential communities of Cuxton and North Halling.	76
E4 08	North Halling to Snodland	The meandering Medway channel is bordered by the residential communities of Halling and Snodland and pockets of freshwater habitat. The floodplain is restricted due to the presence of the railway line, which extends the length of the frontage.	79

Policy Unit		Description	Page No.
E4 09	Snodland to Allington Lock	The hinterland is characterised by an area of nationally designated low-lying freshwater lakes (Leybourne Lakes) south of Snodland and urban communities along the remaining frontage towards Allington Lock. The railway line again extends along the whole of the frontage. The estuary channel is fluvial in form and narrows considerably as it meanders south to Allington Lock.	85
E4 10	Allington Lock to north Wouldham	The urban areas of historic Aylesford and Millhall to the south and areas of agricultural land and freshwater habitats interspersed with small settlements towards the north border the narrow estuary channel between Allington Lock and Wouldham.	89
E4 11	Wouldham Marshes	The low-lying area between the village of Wouldham and the Medway Bridge, rising to higher land, is an area of Outstanding Natural Beauty.	93
E4 12	Medway Bridge to west St Mary's Island	The dense urban areas of Rochester and Chatham extend to the shoreline. The residential and commercial frontages are interspersed with a number of river crossings and strategic links between the Medway Towns and Frindsbury and Strood. The frontage is of considerable commercial importance and is of significant international heritage importance (e.g. Chatham Historic Dockyard), which attracts large visitor numbers.	97
E4 13	St Mary's Island to the Strand	The frontage is dominated by the expanding residential area of St Mary's Island and the residential, commercial and recreational areas along the Gillingham frontage, both of which extend to the shoreline. The frontage is of considerable regional importance for attracting visitors to its recreational areas (e.g. Gillingham Pier and Marina). Some intertidal areas are nationally and internationally designated.	101
E4 14	The Strand to west Motney Hill	The shoreline is locally important for its recreation facilities, e.g. The Riverside Country Park, LNR, RSPB Nature Reserve and the Saxon Shore Way coastal footpath. Intertidal areas along the frontage are internationally designated.	106
E4 15	Motney Hill to Ham Green	Localised settlements of Otterham, Upchurch and Ham Green are interspersed with agricultural land and freshwater marsh. Intertidal areas, as well as areas of freshwater habitat at Motney Hill and at Horsham Marsh are nationally and internationally designated for their environmental importance.	110
E4 16	Ham Green to east of Upchurch	The short length of high land comprising of mainly Grade 1 agricultural land is interspersed with isolated properties. Intertidal saltmarsh and mudflat habitats are nationally and internationally designated.	115
E4 17	East Upchurch to east Lower Halstow	The frontage comprises agricultural land, locally important nature conservation sites at Upchurch and Lower Halstow Brickworks and the historically important area of Lower Halstow. Intertidal habitats are nationally and internationally designated.	118
E4 18	Barksore Marshes	Barksore Marshes is a predominantly low-lying peninsular of agricultural land and marshes, with no built assets, which, apart from the northern tip, is, along with intertidal habitats, nationally and internationally designated for its environmental value.	122

Policy Unit		Description	Page No.
E4 19	Funton to Raspberry Hill	The short length of frontage comprises a small local road, running alongside the shoreline, backed by orchards. Intertidal habitats are nationally and internationally designated for their environmental importance.	126
E4 20	Chetney Marshes	A large low-lying peninsular of agricultural land and marshes bordered by both the Medway and Swale estuaries, important for wildfowl breeding. Parts of the marshes are nationally and internationally designated for their ecological importance as are bordering intertidal areas.	129
E4 21	Kingsferry Bridge to Milton Creek	Regionally important industrial, commercial and dock developments and associated infrastructure are located along the low lying frontage. Habitats are of international environmental importance. The Saxon Shore Way follows the shoreline along the majority of this frontage.	135
E4 22	Milton Creek	A number of regionally important commercial and industrial built assets, located close to the creek shoreline. Large residential and commercial areas are located on the creek's floodplain. The Saxon Shore Way traverses the majority of the shoreline.	140
E4 23	Murston Pits to Faversham	A large expanse of floodplain which rises to high land in the south. A small number of properties are located on higher land, around the edge of the floodplain and in the communities of Conyer and Oare. Habitats are of international importance and frontage is of landscape value. The area is locally important for attracting visitors to the Saxon Shore Way and to a number of nature reserves and bird watching sites located along the frontage. Conyer and Oare Creeks and the Gun Powder Works at Oare are of significant heritage importance.	144
E4 24	Faversham to Nagden	A large number of industrial, commercial, residential and heritage assets are located along Faversham Creek and the historic town of Faversham. The area is locally important for tourism to the Conservation Area and Saxon Shore Way. Habitats are internationally designated for their environmental importance.	149
E4 25	Shell Ness to Sayes Court	The frontage comprises a sand and shell beach and spit, which is backed by nationally and internationally designated saltmarsh and low-lying coastal grazing marsh.	152
E4 26	Sayes Court to north Elmley Island	A large expanse of floodplain rising to high land in the north. A small number of properties and farms are located on the floodplain and on higher land. The low-lying hinterland is interspersed with secondary embankments, and consists of agricultural marshes. Habitats are internationally designated. Some sections are part of a National Nature Reserve (NNR) and RSPB Reserve.	156
E4 27	North Elmley Island to Kingsferry Bridge	The low-lying hinterland consisting mainly of agricultural marshland. Habitats are internationally designated. A small number of properties at Minster Marshes and two local roads are set back from the shoreline. The southern section of hinterland forms part of the Swale National Nature Reserve.	162
E4 28	Kingsferry Bridge to Rushenden	A low lying area immediately north of Kingsferry Bridge. An area of high land at Rushenden Disposal Site. Intertidal habitats and small section of freshwater habitat is internationally designated. Important infrastructure set back from the shoreline.	166

Policy Unit		Description	Page No.
E4 29	Rushenden to Sheerness	Urban areas of Rushenden and Queenborough, which is of national heritage importance, the internationally important Port of Sheerness and regionally important strategic links. Intertidal habitats between Rushenden and north of Queenborough are internationally designated.	170
E4 30	Medway Islands	Habitats internationally designated. Hoo Saltmarsh Island dredging disposal site. SMs located on Hoo Saltmarsh Island and Darnet Ness. Nor Marsh Island is part of Nor Marsh and Motney Hill RSPB Reserve.	175

5.2.2 Additional Information

Heritage Features

Where a proposed policy results in the loss of heritage features (known and unknown) it will be important to consider an appropriate programme of survey, recording and investigation to record these important sites, and those potential features not yet identified.

Footpaths

Where a proposed policy results in the loss of footpaths there is potential, subject to planning consents, for footpaths to be re-routed as the shoreline realigns and / or when defences are realigned.

Land Use within Defended Areas/ Affected by Policies

Flood and erosion defences reduce the risk to the assets they protect but they do not remove the risk completely. To be suitably adaptable to future change and future risks all new development of residences or infrastructure in flood and erosion risk areas should be appropriately adaptable, resilient and resistant. Decisions on the land use within flood and erosion risk areas should fully consider the risk and be adaptable to change.

Where the Shoreline Management Plan recommends Managed Realignment of existing defences, the effect on parties currently protected by the defences will be part of the 'management' of that change.

Managed Realignment Policies

Managed realignment extents are not defined in the following SMP Policy Unit Statement maps as the actual realignment extents along any frontage where Managed Realignment has been proposed will need to be the subject of further studies before any realignment scheme is undertaken. These studies will be required to:

- Identify the best alignment and extent of defences on technical, social, economic and environmental grounds, that best manages flood risk;
- Define the exact standard of protection of any realigned defences along these frontages;
- Investigate implementation methods;
- Assess hydrodynamic impacts of Managed Realignment;
- Investigate future morphological evolution;
- Assess the potential impact on internationally designated sites; and,
- Investigate any mitigation measures required for loss of any designated habitats.

Example extents have however, been identified using available information to assess the objectives, undertake the Habitats Regulations Assessment and to provide a broad scale economic appraisal of policy options. Maps of example extents used are included in **Appendix H, Annex H4**.

Theoretically the maximum extent of any realignment is limited by the extent of the floodplain. However, in reality there are a number of other constraints which mean extent of any realignment is likely to be less than this. Within the present SMP, example realignment extents have therefore, been identified after considering:

- The provision of a more sustainable estuary alignment;
- The avoidance of built assets, infrastructure and internationally designated habitats where practicable;
- The provision of more economic, shorter and sheltered defences, incorporating high land where possible;
- The creation of intertidal habitat; and,
- The potential effects on estuary dynamics.
- It should again be noted that these are indicative extents and the actual realignment extent along any frontage where Managed Realignment has been proposed will be the subject of further studies before any realignment scheme is undertaken.

There should be detailed consideration of future land use, development and infrastructure improvements in all areas of flood and erosion risk, particularly where the policy is not Hold the Line, to enable the shoreline, and the assets affected by it, to adapt in a sustainable, controlled and balanced way.

Economic Viability

It should be noted that a proposed policy of Hold the Line does not guarantee funding for defence maintenance and / or capital works along these sections of the shoreline.
