Appendix L
Essex and South Suffolk Shoreline Management Plan 2

Strategic Environmental Assessment (SEA) Environmental Report

Environment Agency

April 2010
Final Report
9T4884

NON-TECHNICAL SUMMARY

Introduction

This report provides an assessment of the environmental impacts of the Essex and South Suffolk Shoreline Management Plan (SMP). The assessment is informed by the appraisal process within the SMP. The assessment seeks to establish the environmental impacts of the SMP, to evaluate the overall impact of the SMP and to suggest monitoring and mitigation to address any negative impacts. The overriding theme which emerges in this assessment is that the determination of actual impacts is extremely difficult due to the long timeline and uncertainties surrounding the plan and its impacts. The assessment does however confirm that the SMP provides for a wide range of positive impacts, and where negative impacts occur, they are the result of policy which seeks to maintain other environmental values.

The Essex and South Suffolk Coast

Essex has one of the longest coastlines of any English county, and this study covers approximately 440 km of coast between Landguard Point (the most southerly point of Felixstowe) and Southend. It is an unusual coastline incorporating a series of interlinked estuaries with open coast between them. The estuarine areas are dominated by muddy intertidal flats and saltmarshes, whilst the open coast has more varied features including clay sea cliffs and shingle, sandy and muddy beaches.

Overall the coastline is predominantly low lying and protected by flood embankments or sea walls, together with groynes. As areas have been reclaimed from the sea, significant amounts of grazing marsh are at or below sea level. The area's geology is complex, largely consisting of sediments overlying the thick clay and gravel.

There is a small but active fishing fleet and, largely due to its proximity to London, the area has been a traditional holiday area for over a century. Large numbers of tourists visit the coastal area and tourism is a key contributor to the economy of the coastal towns.

A large number of areas are designated at European or International level for their conservation value (in particular under the EU Habitats and Birds Directives, and the international Ramsar Convention). Typically these sites are protected due to their importance for bird species which require intertidal or coastal habitat. The majority of the coastline is also subject to statutory landscape designations, which has important implications for any prospective developments, management or policies. The area is also noted for its historic and archaeological features, including the county's historic rural landscapes.

What is a Shoreline Management Plan?

A Shoreline Management Plan (SMP) is a large-scale assessment of the risks associated with coastal processes and changes. It aims to reduce risks to the social, economic, natural and historic environment, including those issues identified above, while providing sustainable shoreline management over the next century. It does this by proposing appropriate management which reflects both national and local priorities, in

particular to reduce the threat of flooding and erosion to people and their property, as well as supporting the UK Government's 'sustainable development principles'.

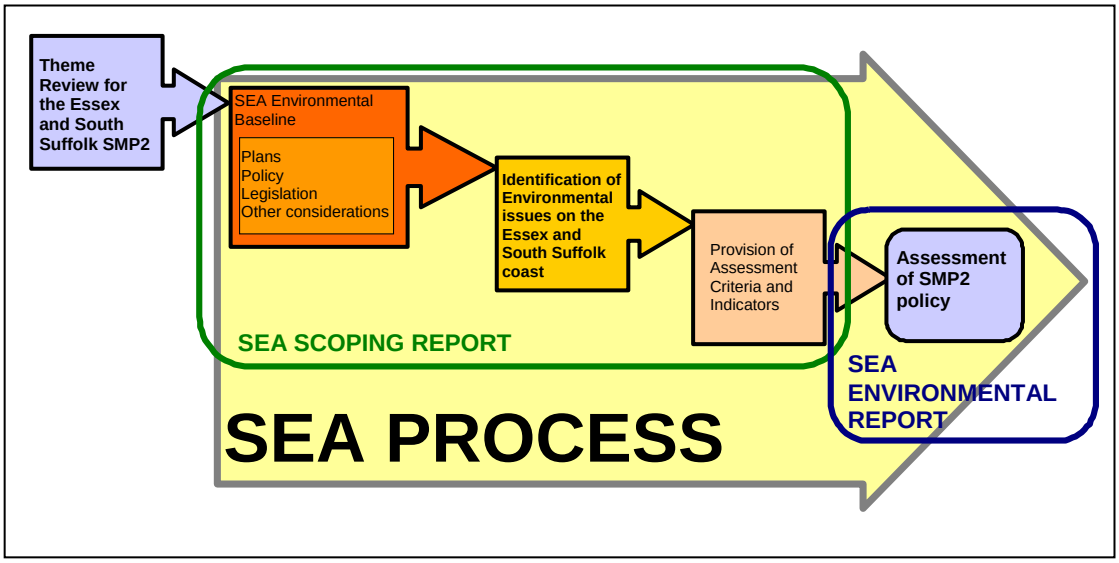
Strategic Environmental Assessment within the SMP2

Strategic Environmental Assessment (SEA) is a process which ensures that environmental considerations are systematically designed into the development of policies, plans and programmes. By considering impacts at this high level the SEA process helps to shape selection of a preferred option which avoids or at least minimises negative environmental consequences, and where possible enhances the positive impact of the SMP2, whilst at the same time complying with legislative and other requirements.

Under European policy (Directive 2001/42/EC) SEA is a requirement for legislative, regulatory or administrative plans and programmes. An SEA has been carried alongside the developing SMP2, although it is not a statutory document, as the SMPs clearly set a framework for future development and have much in common with the kind of plans and programmes for which the Directive is designed. A key element of SEA is to ensure that the process is transparent, and inclusion in the SMP2's development (as illustrated in **Figure S1**) ensures that appropriate considerations have been central to policy development. Within the SEA, and the wider SMP, the term 'environment' is used to cover the following socio-economic and environmental issues:

- Population and communities (including human health, critical infrastructure etc);
- Cultural heritage, including architectural and archaeological heritage;
- Material assets;
- Biodiversity, fauna and flora;
- Soil;
- Water;
- Air;
- Climatic factors; and
- Landscape.

Figure S1 SEA process within the development of a SMP



The Assessment process and this report

The SEA for the Essex and South Suffolk SMP looks at potential impacts of the suite of policies it contains. The SEA process has developed two distinct documents, a Scoping Report and an Environmental Report.

The Scoping Report established the environmental baseline for the Essex and south Suffolk coastline. This identified important characteristics of the environment which then helped in the development a series of 'assessment criteria'. SMP policies could then be assessed using these criteria. The Scoping Report was consulted on with the SMP Client Steering Group (which comprises all of the appropriate statutory consultees) and led to an agreed set of criteria addressing the following issues

1. The need to maintain a balance of providing navigation and access to estuary communities;
2. Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce;
3. Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex and south Suffolk coast;
4. Potential loss of historic and archaeological features on a dynamic coastline;
5. Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types;
6. Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries;
7. Maintenance of water supply in the coastal zone;
8. Threat to the environmental conditions to support biodiversity and the quality of life; and
9. Maintenance of coastal processes required for sustainable coastal management and the integrity of critical coastal habitat and species

Preferred SMP policies were then assessed against the agreed criteria. This Environmental Report is the finalisation of that process. The assessment of likely environmental effects was based on expert professional judgement and supported by peer-reviewed literature. The likely significance of any identified impact was scored against a scale from major positive to major negative. The SMP was assessed at two levels:

1) Detailed assessment of the individual effect of preferred policies for each sub-area of the coast (Policy Development Zone (PDZ)); and
2) An assessment of the plan as a whole (to establish the overall effects of all PDZs).

The detailed assessment was recorded in tables which document the effect of SMP policy in each PDZ against each of the assessment criteria. An additional assessment describes how policies in specific PDZs comply with the assessment criteria. PDZs where SMP policy was predicted to have a number of negative impacts (against the assessment criteria) are described individually. Those with more limited negative impacts are only considered within a discussion of the plan as a whole.

This Environmental Report also identifies additional action, including monitoring and mitigation to ensure that the effects of the SMP2 are minimised as far as possible. These actions are progressed through the SMP2 Action Plan since this is a) directly

linked to SMP delivery and b) builds on the organisational roles developed within the SMP process. This approach provides the most robust mechanism for delivery.

Conclusions

The findings of the SEA provide reassurance that the SMP2 balances consideration of shoreline management with the need to avoid negative impacts on the environment. The critical issue within the SMP2 has been maintaining coastal communities and environmental features whilst recognising the need for management which will be sustainable over the lifetime of the plan, including the impacts of sea level rise.

The negative effects of the SMP largely relate to the loss of some environmental features in the pursuit of managed realignment. The need for management realignment is driven by the necessity to offer environmental benefits such as habitat creation, and a more natural coast line. Wherever possible, realignments have been phased to mid or later epochs to provide time for adaptation.

The Habitats Regulations Assessment which supports the SMP has concluded that there will be an adverse effect on the integrity of international sites due to the loss of intertidal and freshwater habitat. The SEA concludes a major negative impact due to this adverse effect. This adverse effect is considered unavoidable in providing a sustainable approach to management, and addressing the loss of designated intertidal habitat through coastal squeeze. The loss of intertidal and freshwater habitat will be offset through the creation of compensatory habitat.

The SMP2 Action Plan details mitigatory and monitoring requirements of the SMP2. It will ensure that actual impacts are identified at the earliest opportunity and measures are provided in subsequent SMPs to avoid additional environmental impacts occurring. The Action Plan will also be used to inform habitat creation requirements and subsequent SMPs as well as the strategies and schemes which implement the preferred policies.

In conclusion, the overall environmental effects of the plan are positive. Where negative effects have been identified, these are largely due to the pursuit of environmental benefits, and actions have been provided to mitigate or compensate for these effects.

Next steps

<u>Providing comments</u>
This report is provided for consultation simultaneously with the SMP itself. Comments should be provided either in writing or electronically to:

Ian Bliss
Essex and South Suffolk SMP consultation
Environment Agency
Cobham Road
Ipswich
IP3 9JD

All comments on this SEA Environmental Report should be received by 4pm on 18th June 2010.

The Purpose of Consultation

The purpose of consultation for this report is to establish:

- Have the environmental issues been correctly identified?
- Does the report correctly identify negative impacts on the environment?
- Is the information provided correct?
- If issues or detail have been omitted which should be a key element of the assessment?

Answers to these questions, or other issues relating to the environmental effects of the plan would be welcome as a component of consultation.

Subsequent Documents

Following the completion of this report, a Post Adoption Statement and statement of particulars will be provided to detail how the environmental considerations of this process have been integrated into the SMP and how the consultation and response to consultation has been considered within the SEA process.

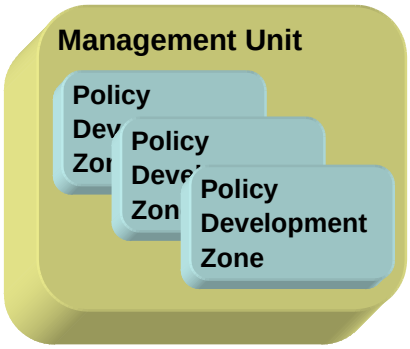
CONTENTS

L1 INTRODUCTION AND BACKGROUND

L1.1 The Essex and South Suffolk Shoreline Management Plan (SMP)

This is the Strategic Environmental Assessment (SEA) Environmental Report (ER) for the Essex and South Suffolk Shoreline Management Plan 2 (SMP2). The Essex and South Suffolk SMP2 runs from Landguard Point, Felixstowe (Suffolk) to the western tip of Two Tree Island, Southend-on-Sea (Essex). It covers approximately 440 km of coastline.

The SMP2 breaks the coast down into ten **Management Units** (MUs). Within these there is a total of 101 **Policy Development Zones** (PDZs). Within this structure the MU level provides the plan's intended strategic management – PDZs are the building blocks to support the overall intent.



L1.2 The SMP context for the SEA

The SEA process accompanying the production of the SMP2 is intended to ensure that environmental issues specific to this stretch of coast are considered in the development and evaluation of policy. This **Environmental Report (ER)** provides the framework for a structured evaluation of the environmental issues relating to the Essex and south Suffolk coast against assessment criteria developed within the **Scoping Report** (provided at **Annex IV**). Within this ER, as well as in the preceding Scoping Report and throughout the SMP process (Defra, 2006) the term environment is used to cover the following receptors (as defined by the SEA Regulations[1]):

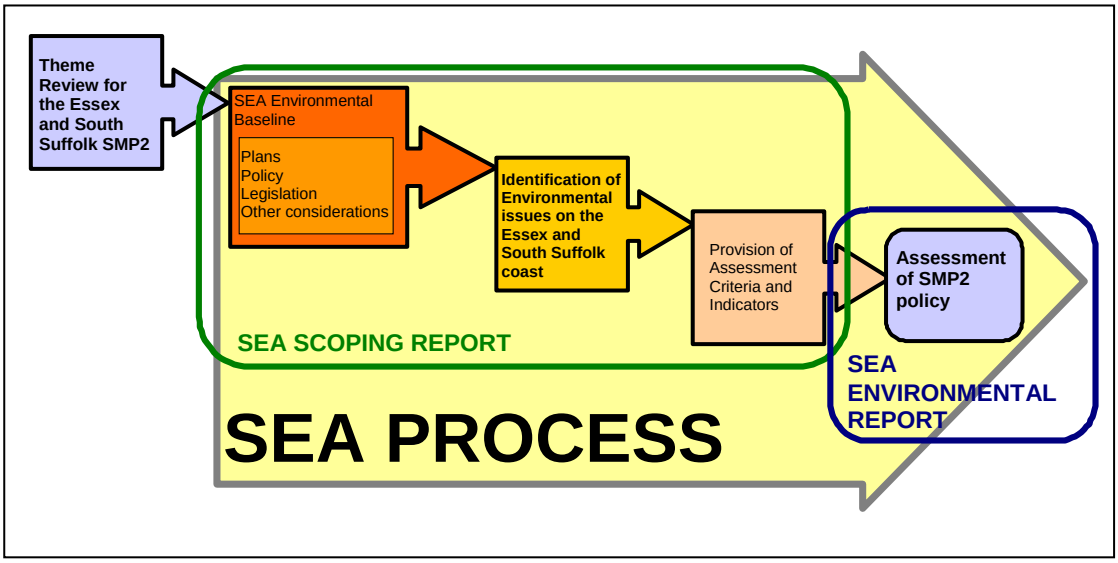
RECEPTORS

- Biodiversity, fauna and flora;
- Population and communities (including human health, critical infrastructure *etc*);
- Material assets;
- Soil;
- Water;
- Air;
- Climatic factors;
- Cultural heritage, including architectural and archaeological heritage; and
- Landscape.

[1] The Environmental Assessment of Plans and Programmes Regulations 2004 (Statutory Instrument 2004 No. 1633) which transpose the European SEA Directive (2001/42/EC on the assessment of the effects of certain plans and programmes on the environment) into UK law.

The way in which the SEA has been integrated into the SMP process is presented in **Figure 1.1**.

Figure 1.1 SEA process within the development of a SMP



L1.3 Why we are using Strategic Environmental Assessment (SEA)

SEA provides a systematic appraisal of the potential environmental consequences of high-level decision-making. The main aim of the EU Directive 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*". An SEA must be undertaken for plans and programmes that are required by legislative, regulatory or administrative provisions. By including environmental considerations at this level SEA aids the selection of preferred options, directs individual schemes towards the most appropriate solutions and locations and helps to ensure that resulting schemes comply with legislation and other environmental requirements.

SMPs set a framework for future development and have much in common with the kind of plans and programmes for which the Directive is designed. Although SEA is not a statutory requirement for SMPs, and this ER is therefore not a statutory document, SMP guidance (Defra, 2006) states that the environmental effects of all policies must be considered before deciding which policies will be adopted. Consideration should be given to both the positive and negative effects of options on wildlife and habitats, populations and health, soil, water, air, climate factors, landscape, cultural heritage and the intrinsic relationship between these. It was therefore recommended that assessment of SMP policies adopts the approach described in the Directive.

This document represents the second stage in the SEA process for the Essex and South Suffolk SMP2. The third and final stage will be a post-adoption statement and statement of particulars.

During the preparation of this document we have drawn, where applicable, upon the following guidance:

- Defra (2004) Guidance on Strategic Environmental Assessment;
- Defra (2006) Shoreline Management Plan guidance: Volume 1: Aims and requirements;
- Environment Agency (2008) Internal Environment Agency guidance on SEA of internal Plans and Programmes;
- Environment Agency (2005) SEA Good Practice Guidelines;
- ODPM (2005) A Practical guide to the SEA Directive; and
- Environment Agency (2009) SEA internal plans and strategies.

L1.4 Scope and structure of this report

This ER builds on the content and findings of the Scoping Report and expresses the way in which the SMP is likely to affect the key environmental issues and associated receptors on the Essex and south Suffolk coast. It comprises seven sections and four annexes, as described below.

Section One introduces this document and sets the context for the use of SEA within the SMP process. In addition, this section explains the rationale behind the SMP itself and describes potential implications of the SMP on the wider environment;

Section Two describes the context and methodology for the SEA, including prediction and evaluation methodology as well as data gaps and uncertainties;

Section Three provides details of the study area covering all parameters considered for the SEA;

Section Four describes the relevant environmental issues and presents the agreed assessment criteria;

Section Five presents the assessment of the SMP at a Management Unit level and at a plan level, and draws conclusions relating to the overall effects of the plan;

Section Six provides an account of mitigation and monitoring measures required to address uncertainties or adverse effects of the SMP;

Section Seven provides the references for the study;

Annex I presents a detailed assessment of SMP Policy, in the form of Assessment tables;

Annex II presents a summary of consultation responses;

Annex III provides consideration of the effects of the SMP policy on environmental receptors;

Annex IV provides a copy of the SEA Scoping Report; and

Annex V provides a complete and final set of SMP policies.

L1.5 Shoreline Management Plans (SMPs)

L1.5.1 SMP aims and objectives

A Shoreline Management Plan (SMP) is a large-scale assessment of the risks associated with coastal processes and aims to reduce the risks to the social, economic, natural and historical environment. An SMP aims to manage risk by using a range of methods which reflect both national and local priorities, to (Defra, 2006):

- Reduce the threat of flooding and erosion to people and their property; and
- Benefit the environment, society and the economy as far as possible, in line with the Government's 'sustainable development principles'.

The first generation of SMPs was produced for the coastline of England and Wales in the late 1990s, based on sediment cell boundaries which related to the movement of sand and shingle along the coast. In most cases, the boundaries of these cells are set at locations where the net 'along shore' movement of sand and shingle changed direction. The current program of SMPs reflects the availability of new coastal processes information, new considerations (site designations) and reduced uncertainty about climate change.

The objectives of an SMP must be in line with the Government's strategy for managing risks from floods and coastal erosion and should (Defra, 2006):

- Set out the risks from flooding and erosion, to people and the developed, historic and natural environment within the SMP area;
- Identify opportunities to maintain and improve the environment by managing the risks from floods and coastal erosion;
- Identify the preferred policies for managing risks from floods and erosion over the next century;
- Identify the consequences of putting the preferred policies into practice;
- Set out procedures for monitoring how effective these policies are;
- Inform others so that future land use, planning and development of the shoreline takes account of the risks and the preferred policies;
- Discourage inappropriate development in areas where the flood and erosion risks are high; and
- Conform with international and national nature conservation legislation, and aim to achieve United Kingdom Biodiversity Action Plan (UKBAP) objectives.

The most appropriate option for shoreline management will depend on the section of coastline in question and on technical, environmental, social and economic circumstances. The four options considered for shoreline management in the second generation SMPs are presented in **Table 1.1**.

Table 1.1 Options used in SMP2 development

SMP2 option	Description of option
Hold the line (HTL)	Hold the existing defence line by maintaining or changing the standard of protection. This policy will cover those situations where work or operations are carried out in front of the existing defences (such as beach recharge, rebuilding the toe of a structure, building offshore breakwaters and so on), to improve or maintain the standard of protection provided by the existing defence line. This policy incorporates others which involve operations to the back of existing defences (such as building secondary floodwalls) where they form an essential part of maintaining the current coastal defence system.
Advance the line (ATL)	Advance the existing defence line by building new defences on the seaward side of the original defences. Using this policy is should be limited to those policy units where significant land reclamation is considered.
Managed realignment (MR)	Allowing the shoreline to move backwards or forwards, with management to control or limit movement (such as reducing erosion or building new defences on the landward side of the original defences).
No active intervention (NAI)	No further investment in coastal defences or operations.

Within the development of an SMP2, an epoch (time period) based approach is used for planning purposes. The three epochs considered with SMP2 are from the present day, medium-term and long-term and these correspond broadly to time periods of 0 – 20 years, 20 – 50 years and 50 – 100 years respectively.

L1.5.2 Implications of SMP policy on the wider environment

Each of the SMP2 policies has the potential to impact the wider environment in one or more ways. **Table 1.2** presents potential implications of each option.

Table 1.2 Potential generic implications of each SMP2 option

SMP2 option	Positive impacts	Negative impacts
Hold the line (HTL)	• Protection of communities and infrastructure located within the coastal flood zone; • Protection of habitat landward of defences; • Protects freshwater resources (e.g. abstractions and boreholes); • Provides stability to areas of coastline, within a wider management context; • Protects economic assets located behind defences; and • Provides protection to ecological, cultural and historical assets landward of the defences.	• Coastal squeeze (loss of habitat); • Interruption of coastal processes; • May increase flood and coastal erosion risk elsewhere; • Promotes unsustainable land use practices with the coastal flood zone; • Diverts limited resources away from an adaptation response to rising sea levels; and • Requires ongoing commitment to future investment in maintenance and improvement.
Advance the line (ATL)	• Provides additional space for communities; • Protection of communities and infrastructure located within the coastal flood zone; • Protection of habitat landward of defences; • Protects freshwater resources (e.g. abstractions and boreholes); • Protects economic assets located behind defences; and • Provides protection to ecological, cultural and historical assets landward of the defences.	• Reduction in extent of coastal habitat; • Change in functionality of habitat; • Increased coastal squeeze; • Interruption of coastal processes; • Effect on marine habitat; and • May increase rate of coastal erosion either side of the advanced line.
Managed realignment (MR)	• Coastal habitats allowed to move landwards under rising sea levels • Creation of habitat to aid UKBAP; (United Kingdom Biodiversity Action Plan) and local BAP (Biodiversity Action Plan) targets; • Habitat created for juvenile fish and other aquatic organisms (benefits to environment and fishing communities); • Reduces flood risk; • Promotes natural coastal processes; • Contributes towards a more natural management of the coast; and • Creation of high tide roosts and feeding areas.	• Reduction in extent of habitat landwards of defences; • Change in nature of habitat to landward of defence; • Impact upon aquifers and abstractions; • Loss of communities or community assets; • Loss of heritage and cultural features; and • Requires ongoing commitment to future investment in maintenance and improvement.

SMP2 option	Positive impacts	Negative impacts
No active intervention (NAI)	• Coastal habitats allowed to move landwards under rising sea levels; • Promotes natural coastal processes; and • Contributes towards a more natural management of the coast.	• Lack of certainly of effects and time for adaptation; • Increased risk of inundation to landward habitats under rising sea levels; • Impact upon aquifers and abstractions; • Loss of communities or community assets; and • Loss of heritage and cultural features.

L1.5.3 Implications of SMP2 policy on environmental receptors

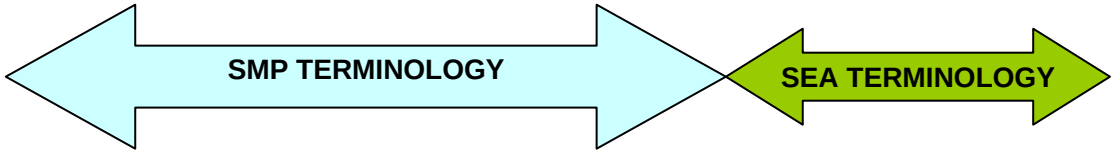
Defra SEA guidance (Defra, 2004) identifies a series of environmental receptors which should form the initial scope of the SEA. These are the environmental features which may be impacted the SMP.

According to SEA Regulations, each environmental receptor should be initially appraised to examine the potential impacts of the SMP. This appraisal is provided in **Annex III**. SMP guidance (Defra 2006) also requires that it is developed with appropriate consideration of the environmental features of the coast, features which need to be assessed to determine the nature and characterisation of the coast.

The receptors identified for the Essex and South Suffolk SMP SEA have broadly been aggregated from those specified in the SEA guidance, but there is a difference of language between the building blocks of the SEA and the SMP. The requirements of the SMP mean that, for example, 'biodiversity, fauna and flora' (a receptor identified in the SEA guidance) has been split into two receptors, 'habitats' and 'species', to better facilitate the impact assessment. Both SMP development and the SEA assessment have used a consistent set of criteria based upon both SMP and SEA guidance. **Table 1.3** clarifies how SMP features relate to SEA receptors. This demonstrates how the SEA process has been integral to the evaluation and development of SMP policy.

Table 1.3 SMP and SEA Terminology

SMP Issues and Objectives	SMP Thematic Review	SEA Receptor
Environment	Natural environment	Habitats
		Species
		Air
		Water
	Agriculture	Soil
	Landscape and character	Landscape
		Material assets
		Population
Heritage	Historic environment	Cultural heritage
Commercial	Current and future land use	Population and communities
Recreation		
Hard assets		



The identification of receptors which may be impacted by the SMP provides the focus for the subsequent assessment. It is then necessary to establish how the SMP may impact on these receptors.

L1.6 How the SEA has influenced the SMP?

The requirements of the SEA Directive, and the manner in which it was applied to SMPs, was instrumental in determining how Policy Appraisal would be carried out within the SMP. The Policy Appraisal process was structured to have regard to environmental receptors specific to the Essex and south Suffolk coast. It was therefore a composite process based on the requirements of SMP guidance and a focus on environmental receptors and issues from the SEA Scoping Report.

The Policy Appraisal process subsequently applied the scoping process of the SMP (to only focus on realistic options) and provided draft policy based on the intent to avoid negative effects on specific environmental features (for instance community features, historic assets, units of Sites of Special Scientific Interest (SSSI), etc). The factors underlying the policy appraisal were therefore consistent with the SEA assessment criteria. This approach led to the selection of preferred policies which align with the SEA assessment criteria.

L1.7 SEA Scoping Report and the response to consultation

The SEA Scoping Report established the environmental baseline (including key environmental issues) and developed a suite of assessment criteria which have been used within this report for the assessment of SMP policy.

The Scoping Report was used as a basis for a four week consultation period (as agreed with the Environment Agency's National Environment Assessment Service (NEAS)) between the 28th August and 25th September 2009, during which the consultees listed below were invited to provide comments on the environmental baseline and the assessment criteria. In particular a number of questions were posed to consultees, as shown below.

CONSULTEES FOR THE SEA SCOPING REPORT

- Environment Agency;
- Natural England;
- English Heritage;
- Tendring District Council;
- Chelmsford Borough Council;
- Suffolk Coastal District Council;
- Ipswich Borough Council;
- Babergh District Council;
- Colchester Borough Council;
- Maldon District Council;
- Braintree District Council;
- Rochford District Council;
- Southend-on-Sea Borough Council; and
- Essex County Council; and
- Suffolk County Council.

QUESTIONS POSED DURING THE SEA SCOPING REPORT CONSULTATION

1. Has the Scoping Report correctly identified the environmental issues on the Essex and South Suffolk Coast (i.e. are there additional issues which need to be addressed?);
2. Has the baseline (in combination with the Theme Review and Characterisation report) provided an appropriate level of detail to support the assessment?
3. Do the assessment criteria provide an appropriate mechanism for the assessment of the environmental effects of the SMP? and
4. Is the suggested methodology considered robust and appropriate to the assessment of the environmental effect of the SMP?

Comments were received from Suffolk County Council, Essex County Council, Southend-on-Sea Borough Council, the Environment Agency, Natural England and English Heritage. These provided further detail focussed on ensuring that the assessment criteria were more specific to:

- The range of designated sites and habitat under UK and environmental legislation;
- Baseline information for the study area; and
- The historic environment.

The changes to the assessment criteria resulting from consultation have been incorporated into this report and ensure that ecological and heritage features are assessed in an appropriate manner to a consistent level of detail.

The assessment in **Annex III** provides an illustration that all SMP policy options have the potential to have an impact on all SEA receptors, with the exception of Air, and Climatic factors. Air has been scoped out as a receptor potentially effected by the SMP since no pathway was identified for this effect. SMP policy concerns itself with land, water and the tidal interface as a spatial area. No instances were identified where SMP policy could have any impact, positive or negative, on air quality. Climatic factors were also not deemed pertinent to the SMP policy assessment. These receptors were scoped out through consultation due to the intangible manner in which SMP policy (being abstract and aspirational) could be directly regarded as influencing these receptors.

L1.8 Synergies with other parallel processes

The SEA forms a component of the wider assessment mechanisms for the SMP which also include:

- The Appropriate Assessment under the Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora); and
- Consideration of the requirements of the Water Framework Directive (Council Directive 2000/60/EC establishing a framework for Community action in the field of water policy).

Although monitoring measures are presented, the actual specification of monitoring and the actions to enact them will be included in the SMP Action Plan.

L1.9 Evaluation of the plan and alternatives – what is the appropriate level of assessment?

The function of a SMP is to consider the coast as a whole from the perspective of managing coastal flood and erosion risk. The behaviour of the Essex and south Suffolk coast is driven by its geological make-up and it is therefore evident that no singular aspect of the coastal (in terms of its physical behaviour, natural or built) environment dominates. There is a complex interdependence between different values which means that a decision taken within one PDZ or MU has the potential to affect multiple adjacent units. It should also be remembered that the SMP structure is to provide strategic management at the MU level – the PDZs provide the discrete units to support this.

The pertinent question is, therefore: should the assessment be provided at the MU or PDZ level? The most appropriate approach appears to be at the MU level, so the collective impacts of the SMP can be evaluated within a management context (the management of an estuary or area of open coast etc). Equally, the assessment at an MU level provides for an appropriate depth of assessment.

This plan contains 10 MUs and 101 PDZs. As a result, if SMP policy at each PDZ was to be assessed individually and in-combination, then there would be a multiplier effect along the coastline such that each PDZ would need to be assessed not only for the four options detailed above, but for each option in combination with one of four options for the two adjacent management units. This would result in each policy unit being assessed 64 times. It was therefore considered inappropriate and unmanageable for a simple and rigid appraisal procedure to be applied at the PDZ level. Additionally for many PDZs only a limited number of policy options can be considered 'appropriate'; for example, a policy of managed realignment would be inappropriate for a heavily populated area, as would a policy of advance the line on a dynamic and natural shoreline.

Assessment of each SMP policy option for each PDZ was considered too unwieldy, and therefore unnecessary, especially since the "spirit of SEA" was applied throughout policy development (through the Policy Appraisal).

L1.9.4 The Policy Appraisal process within the SMP and its importance in the consideration of options within the SEA

The key factor is that the alternative approaches to management have been considered within the SMP processes according to SMP guidance. Whilst this process does not use the same terminology as the SEA process, and the manner in which alternatives would be assessed differs from a more simple SEA-based assessment, the SMP does provide a rigorous and robust consideration of the feasible options for management. SMPs are concerned with strategic management of complex coasts over long periods of time. In order to undertake such an exercise, a focussed approach to policy appraisal is required and is provided within the SMP process. This process - the Policy Appraisal exercise within the SMP - provides a clear account of how options have been evaluated and should be sourced for an understanding of how policy has developed.

The Policy Appraisal process is described in full in Appendix G of the SMP document (The Policy Appraisal Report). Elements of this report are pertinent to the SEA since they describe how the evaluation of options was provided in the SMP process, and by

extension define how the assessment within the SEA is focussed on ‘actual’ rather than ‘theoretical’ options.

The essence of this task was to identify:

- *Obvious* policy choices for certain frontages and epochs – the intent being to streamline the process by avoiding having to provide detailed appraisal for frontages where the sole approach to management is considered obvious; and
- *Unrealistic* policy choices for certain frontages and epochs – the intent being to avoid having to evaluate options which have no driver and thereby limiting the number of options that need appraisal.

All policy options have drivers (reasons for) and constraints (reasons against). These are listed below (**Table 1.4**), as applied to Essex and South Suffolk SMP.

Table 1.4 Drivers and Constraints for SMP2 Policy

SMP2 Policy	Drivers	Constraints
Hold the Line	• Existing land use: communities, infrastructure, agriculture, historical assets, freshwater habitats, tourism / amenity	• Flood risk management budget • Intertidal habitats (coastal squeeze) • Coastal / estuary processes
Managed Realignment	• Intertidal habitats • Flood risk management budget (in case of realignment to more cost effective location) • Wider benefits (tourism, amenity, fisheries, etc)	• Existing land use: communities, infrastructure, agriculture, historical assets, freshwater habitats, tourism / amenity • Flood risk management budget (in case of realignment to less cost effective location)
Advance the Line	• Reclamation to create agricultural land, freshwater habitats. To be determined whether these are realistic drivers.	• Intertidal habitats • Existing use of foreshore • Flood risk management budget
No Active Intervention	• Flood risk management budget • Technical feasibility • Enhancement of intertidal habitats • Coastal / estuary processes (Increase of tidal prism, longshore effects)	• Existing land use: communities, infrastructure, agriculture, designated monuments, freshwater habitats

The Policy Appraisal process looked for drivers or constraints of such an absolute nature that it was possible to rule out a policy or even determine policy selection without full appraisal. **A policy was considered as a genuine option only if there was at least one driver and if there were no absolute constraints.**

Whilst the decision as to whether a constraint is absolute or not is a matter of judgement, the evaluation was provided on a cautionary basis and was provided for discussion and agreement to the Client Steering Group (CSG) and Elected Members Forum (EMF) for the SMP2. The results were as follows:

Hold the Line

Hold the Line (HtL) always has a driver for currently defended frontages: to sustain current land use. There can be strong constraints (such as pressures from coastal processes or habitat loss due to coastal squeeze), but these are not sufficiently absolute to eliminate HtL for appraisal. This means that HtL is part of the coastal policy context for all currently defended frontages.

The only exception is Wallasea Island, where the decision has already been made outside the SMP to carry out Managed Realignment (MR) in Epoch 1.

Managed Realignment

MR can be an option for frontages that currently have flood defences. The key drivers would be the reduction of pressure on the defences (from channel movement or waves)

by moving them landward, and the creation of intertidal habitat. Both drivers are particularly relevant where there is a loss of foreshore (either current or predicted). There can of course also be strong constraints for MR, because of its impact on existing land use. The Policy Appraisal Report discussed above looks in more detail at these drivers and constraints, aiming to refine the coastal policy context by identifying frontages for which MR is or is not a realistic option. There can also be cases where MR is a realistic option because the value of the protected features is limited and is outweighed by the benefits of realignment.

Note that in any case, MR is only realistic within certain constraints: the landward extent is limited where there are features (such as established settlements) that need continued protection; furthermore, the timing of the realignment has to take into account the time needed for adaptation of the people, businesses and organisations affected. These constraints were taken into account in the development of the alignments for MR options.

For undefended high ground frontages, it can sometimes be a realistic management approach to limit or slow down erosion; this is neither HtL nor No Active Intervention (NAI), so must be labelled MR. For currently undefended frontages, this is only part of the coastal policy context if ongoing erosion is likely to threaten significant features. The Policy Appraisal document looks in more detail at these frontages to refine the coastal policy context by identifying frontages where MR is a realistic option.

No Active Intervention

NAI is a realistic option for all currently undefended frontages. It is not an option for any flood defences that protect dwellings (permanent or temporary) as it could lead to failure of the defences in an uncontrolled manner. As mentioned under MR, there can be frontages where the value of the protected features is limited. For some of these, the available information suggested that continued maintenance would be difficult to justify. NAI could be a realistic option, although only after time for adaptation.

Advance the Line

Advance the Line (AtL) will always have significant impacts, so it is only realistic if there is a strong driver. Only two PDZs were identified where this may be the case: Felixstowe Port (PDZ A1), where an extension is underway, and Bathside Bay (PDZ A11a) where planning permission for an extension has been granted. For all other PDZs there are no strong drivers for AtL so with these two exceptions AtL can be eliminated for the whole SMP area.

The Policy Appraisal process was used as the primary mechanism to refine and scope the ‘actual’ or ‘realistic’ options, and determined that:

- HtL was considered part of the coastal policy context for all frontages that are currently defended, apart from Wallasea Island (H10);
- AtL was considered not part of the coastal policy context for any of the frontages apart from Felixstowe Port and Bathside Bay;
- MR was, in principle, considered for all frontages with flood defences and for all currently undefended high ground frontages; and
- NAI was considered an option for all currently undefended frontages.

It is considered that, within the context of the SEA, this process should be regarded as the formative base for what the actual options for consideration are. The assessment of SMP policy within the SEA therefore has regard to the preferred policy and, where that policy is identified as having a negative effect, any option that was considered as an actual or realistic option within the Policy Appraisal process.

L2 CONTEXT AND METHODOLOGY

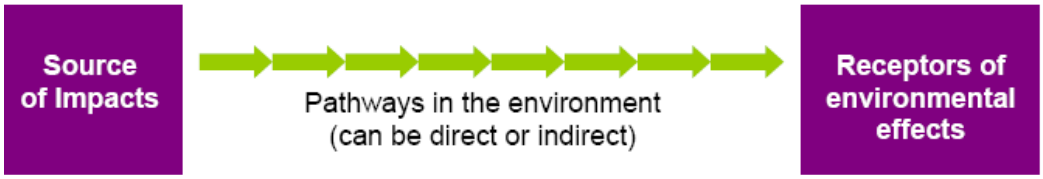
The SEA process is clearly defined in the SEA Regulations and guidance suite. The basic process follows the provision of a Scoping Report (**Annex IV**) which included the environmental baseline, identified key environmental issues, outlined the methodology to be used and offered a series of assessment criteria.

Following consultation on the Scoping Report and the development and assessment of SMP preferred policies, this report details and records the actual assessment of the preferred policy option. This includes prediction and evaluation of effects, assessing in-combination/cumulative effects, and the identification of mitigation and monitoring. Subsequent to this, a Post Adoption Statement and statement of particulars will be provided which will detail the manner in which the assessment will be used to ensure that the actual effects of the SMP are accounted for through monitoring and response.

L2.1 Prediction and Evaluation Methodology

The methodology used to identify and predict the likely significant environmental effects of implementing the plan is described below. To assess the environmental effects of implementing the SMP, an evidence based, expert judgement system based on the widely accepted Source-Pathway-Receptor model (SPR) was adopted (**Figure 2.1**).

Figure 2.1 The Source-Pathway-Receptor model as applied to SEA



Due to the nature of SMP policy, which is high level and therefore lacks the detail of an actual scheme, the assessment is based on established effects wherever possible, but relies on expert judgement of anticipated effects. The performance of each SMP MU or policy grouping against each assessment criteria is given a significance classification in addition to a short descriptive summary (e.g. widespread negative effects with no uncertainty). For each SMP MU, the assessment table also includes a more comprehensive rationale of the judgement process. In particular, the following considerations were paramount in determining environmental effects and likely significance:

ASSESSING THE SIGNIFICANT OF EFFECTS

- Value and sensitivity of the receptors;
- Is the effect permanent / temporary;
- Is the effect positive / negative;
- Is the effect probable / improbable;
- Is the effect frequent / rare;
- Is the effect direct / indirect; and
- Will there be secondary, cumulative and / or synergistic effects.

Table 2.1 Environmental Impact Significance Categorisation

Significance of SMP Policy	
++	SMP policy is likely to result in a major positive impact on the environment.
+	SMP policy is likely to have a positive or minor positive impact on the environment (dependant on scheme specifics at implementation).
0	SMP policy is likely to have a neutral or negligible effect on the environment.
-	SMP policy is likely to have a negative or minor negative impact on the environment (dependant on scheme specifics at implementation).
--	SMP policy is likely to have a major negative impact on the environment.
~	The relationship between the SMP policy and the environment is unknown or unquantifiable.
	The assessment criterion is not applicable

Where gaps in knowledge exist (relating to the information required to support an assessment of the link between policy and receptor), expert judgement is used or a decision of unquantifiable effect recorded. The receptors are specified in the SEA Practical Guidance (ODPM, 2006) and are listed in **Table 1.3**.

Table 2.2 summarises how the significance of each effect was established for the assessment criteria. An explanation of how significance was established needs explanation within the SMP context. SMP policy provides only a direction for management (the details are provided at the scheme level), and the timeline of the plan is long (approaching 100 years). The SMP also deals with dynamic coastal areas, where receptors are subject to a range of human and natural processes and levels of change. The impacts of management direction are therefore often subject to a high degree of uncertainty.

Table 2.2 How the significance of each effect was established for the assessment criteria

Assessment Criteria	How the significance of SMP effects was established
ISSUE - Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types	
Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Where SMP policy would enable the development of a natural mosaic of coastal habitat a positive score would be provided. If the policy provides for a shift in management (from the present position) that would actively enable a more natural development of coastal habitat, a major positive score would be provided. Where the effects of policy would provide for a continuation of management which supports the development of natural coastal habitat a minor positive score would be provided. Negative scores would be provided for ongoing management which prevents the development of a range of coastal habitat (minor negative) or provides for a shift in management which would not work with coastal processes and prevent the development of coastal habitat (major negative).
Will SMP policy have an adverse effect on the integrity of any international sites?	If the effect of policy would lead to an adverse effect on an international site (as defined through a statutory HRA) then a major negative score would be provided. A minor negative score would be provided if the effects of policy would not prevent an adverse effect from occurring based on impacts of coastal processes or sea level rise. Minor positive scores would be provided where the effects of policy would prevent an adverse effect from occurring through maintaining an existing policy position or coastal process trend. The provision of a new management position (for example from HTL to MR) to avoid an adverse effect would provide a major positive score.
Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Given that nearly all BAP habitat in this area is priority habitat, the principle guiding the assessment is one of no overall net loss of BAP habitat. Where there is no net loss of BAP habitat, scores would be provided as positive based on the degree to which policy maintains a natural balance of BAP habitat in a dynamic context. Major or minor negative scores would be provided where the effects of policy would lead to a loss of BAP habitat (the actual determination of major or minor is based on the extent of loss, considered within the context of the overall extent of habitat in the system.

Assessment Criteria	How the significance of SMP effects was established
Will SMP policy contribute to further SSSIs falling into unfavourable?	For SSSIs the same principles as for UK BAP habitats above would apply. However, due to the nature of management obligations under the *Countryside and Rights of Way (CRoW) Act 2000* major negative scores would only be provided where the effects of policy would cause a site to move into unfavourable condition.
ISSUE - Maintenance of coastal processes required for sustainable coastal management and the integrity of critical coastal habitat and species	
Will SMP policy lead to the loss of agricultural land	If the policy provides for long term security of grade 1 and 2 agricultural land then an assessment of neutral or minor positive has been provided. A key aspect of this assessment is the degree to which existing defences will offer long term protection in response to sea level rise, or whether additional defence works would be required to address the effects of sea level rise. If additional works would be required, the policy would provide for enhanced defence provision to maintain the same levels of risk – and a minor positive score would be appropriate*. Equally, where loss is anticipated, the effects of policy would be considered minor negative if the loss is considered largely due to the effects of sea level rise or major negative if such loss was due to active breaches of defence or realignment in response to SMP policy. ***This principle of scoring minor positive or negative based on the effect of policy coupled with the effects of sea level rise underpins many of significance decisions in this assessment. This principle should therefore be considered a central consideration throughout the assessment, and is not repeated in the explanations that follow.**
ISSUE - Maintenance of environmental conditions to support biodiversity and the quality of life	
The need to ensure that water quality is not adversely affected as a result of SMP policy.	The assessment would be supported by the content of the separate WFD assessment (Environment Agency 2009: Appendix K). Scores would be based on a summary of how well the policy meets WFD requirements

Assessment Criteria	How the significance of SMP effects was established
ISSUE - Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries	
Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Where SMP policy would enable natural coastal processes a positive score would be provided. If the policy provides for a shift in management (from the present position) that would actively enable a more natural development of the coast, a major positive score would be provided. Where the effects of policy would provide for a continuation of management which supports coastal processes a minor positive score would be provided. Negative scores would be provided for ongoing management which prevents the development of natural coastal processes (minor negative) or provides for a shift in management which would not work with coastal processes (major negative).
Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	If the policy provides for an enhanced level of protection (in real terms, in addition to sea level rise), then a major positive score would be provided. If the policy maintains the existing level of defence (in the face of sea level rise), then a minor positive score would be provided. If the policy would reduce the level of defence, then a negative score would be provided. The extent to which the negative extent would be determined as minor or major would be dependent on whether there would be a need for properties to be relocated (major negative) or if properties would be maintained at a lower level of overall protection (minor).
Does the policy work with or against natural processes.	Where SMP policy would enable natural coastal processes a positive score would be provided. If the policy provides for a shift in management (from the present position) that would actively enable a more natural development of the coast, a major positive score would be provided. Where the effects of policy would provide for a continuation of management which supports coastal processes a minor positive score would be provided. Negative scores would be provided for ongoing management which prevents the development of natural coastal processes (minor negative) or provides for a shift in management which would not work with coastal processes (major negative).
ISSUE - Maintenance of water supply in the coastal zone	
Will SMP policy adversely affect abstraction infrastructure?	Where SMP policy would maintain the present abstraction infrastructure a minor positive score would be provided. Where the policy provides for enhanced levels of protection for infrastructure (which may come under threat from erosion or sea level rise) then a major positive score may be provided. Typically, however, SMP policy seeks to maintain such features by holding existing lines, possibly requiring improved defences (to address sea level rise). Under such a scenario a minor positive score would be provided. Where abstraction infrastructure would be lost as a result of policy, the determination would consider whether the entire function of the infrastructure would be lost (major negative) or whether it could be maintained by providing a new landward abstraction point (minor negative).

Assessment Criteria	How the significance of SMP effects was established
ISSUE - Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast	
Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	In establishing the effects on the coastal landscape, considerations are based on the maintenance or loss of key features which contribute to the landscape (heritage assets, habitat, key landmarks etc), and the need to ensure that the specifics of the dynamic behaviour of the coast are maintained. In the case of the Essex and South Suffolk SMP, this would entail maintaining estuarine systems and low lying coastal areas and also areas of open coast with sandy beaches. Where a policy would lead to the loss of significant features within the coastal landscape a major or minor negative score would be provided, depending on the extent of the effects of such a loss. Where policy would enable the coast to function 'naturally' (as above) or would enable key features to be maintained, the policy would be minor positive. A major positive score would be provided where the effects of policy would lead to the loss of features, or processes which actively detract from the coastal landscape.
ISSUE - Potential loss of historic and archaeological features on a dynamic coastline	
Will SMP policy maintain key historic features and areas along the coastline?	Where policy would lead to the loss of a designated heritage asset (defined in the main report) a negative score would be provided. A major negative score would be provided if the effect of policy would be to actively shape management in a new direction leading to such a loss. A minor negative score would be provided for the loss of assets in locations where defence may not be sustainable, or where previous management practice is maintained which may lead to the loss of assets which have come under threat. Minor positive scores would be provided for policy which protects assets as a continuation of management in response to sea level rise. Major positive scores would be provided for new management directions specifically to protect heritage assets.
Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Where policy would lead to the loss of areas where archaeological assets are considered likely a negative score would be provided. A major negative score would be provided if the effect of policy would be to actively shape management in a new direction leading to such a loss. A minor negative score would be provided for the loss of areas where archaeological assets are considered likely in locations where defence may not be sustainable, or where previous management practice is maintained which may lead to the loss of such areas which have come under threat. Minor positive scores would be provided for policy which protects areas where archaeological assets are considered likely as a continuation of management in response to sea level rise. Major positive scores would be provided for new management directions specifically to protect areas where archaeological assets are considered likely.

Assessment Criteria	How the significance of SMP effects was established
ISSUE - Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce	
Protection of coastal towns and settlements	
Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	The assessment here is underpinned by the principle outlined above (*). Major scores (either positive or negative) would be provided where the effect of policy would be to either enhance or reduce the actual level of protection offered, accounting for sea level rise. Minor positive scores would be provided where the policy maintains the level of defence, by increasing the actual defence offered by sea walls to account for sea level rise. This is considered a minor positive rather than a neutral effect since as a result of policy, actions would ensue to maintain levels of defence for coastal communities.
Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Where key features are maintained a minor positive score would be provided, if policy maintains this protection in response to sea level rise. If the plan provides for additional levels of protection, then a major positive score would be provided. Losses would be scored as minor negative if the features lost would still maintain the overall function of such features, or major negative if the loss would lead to a substantive reduction on the function of such features in that area.
Protection of key coastal infrastructure	
Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Where SMP policy would maintain the presence of a road a minor positive score would be provided. Where the policy provides for enhanced levels of protection for a road (which may come under threat from erosion or sea level rise) then a major positive score may be provided. Typically however SMP policy seeks to maintain such features by holding existing lines, possibly requiring improvement to defences (to address sea level rise). Under such a scenario a minor positive score would be provided. Where a road would be lost as a result of policy, the determination would consider whether the entire function of the road would be lost (major negative) or whether it could be maintained by providing an amended route (minor negative).
Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	The same principle as roads above.

Assessment Criteria	How the significance of SMP effects was established
Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	The same principle as roads above.
Will SMP policy protect, in situ, Bradwell Nuclear power station.	The same principle as roads above.
ISSUE - The need to maintain a balance of providing navigation and access to estuary communities	
Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	The same principle as roads above.

L2.2 Development of SEA assessment areas

The assessment is provided at the MU level. MUs within the SMP are defined according to coastal processes and provide a series of policies for a spatial area. MUs are the building blocks of the SMP and, as described above, the SEA provides an assessment at this level.

The coast is divided up into 10 MUs which enables the assessment to consider policy as an 'intent of management' for areas of coast within the SMP.

Management Unit A – Stour and Orwell
Management Unit B – Hamford Water
Management Unit C – Tendring Peninsula
Management Unit D – Colne Estuary
Management Unit E – Mersea Island
Management Unit F – Blackwater Estuary
Management Unit G – Dengie Peninsula
Management Unit H – Crouch and Roach Estuaries
Management Unit I – Foulness, Potton and Rushley Islands
Management Unit J – Southend-on-Sea

L2.3 Assumptions within the assessment

Throughout the course of this assessment assumptions have been made to allow a "best-case" assessment to be made (to reflect the high-level nature of SMPs), including:

- Thorough, scheme level assessments will be conducted at the time of a change in coastal management (i.e. a specific consideration of the impacts of actual schemes which alter the manner of how the coast is to be managed);
- Scheme design will ensure that all environmental effects are mitigated or reduced to the lowest possible level; and
- The context for implementation of the SMP is provided by a wide range of international and national supporting legislation, and further environmental assessments will be undertaken for strategies and schemes, as well as future reviews of SMPs.

L2.4 Mitigation and monitoring

Any mitigation measures or monitoring which are required as a result of this assessment are clearly specified and listed in this report and will ultimately be included in the SMP Action Plan. This approach provides the most robust mechanism for delivery, since the Action Plan is a) directly linked to SMP delivery and b) builds on the organisational roles developed within the SMP process.

L3 STUDY AREA

L3.1 Definition of study area

The Essex and South Suffolk SMP study area encompasses approximately 440km of coastline, stretching from Landguard Point (Felixstowe) (Ordnance Survey Grid Reference TM 283 311) to the western tip of Two Tree Island, Southend-on-Sea (Ordnance Survey Grid Reference TQ 810 849) and is presented in **Figure 3.1**. It includes the River Orwell as far as Ipswich, the Stour as far as Manningtree, Hamford Water and the Rivers Colne, Blackwater, Crouch and Roach.

A detailed social and environmental baseline is provided within the Scoping Report (Annex IV), to which the reader should refer for more detailed information on the study area. A concise account of the baseline and the environmental issues identified on the Essex and south Suffolk coast is provided in this section and offers a reference point to the factors which have shaped the form and content of the assessment.

L3.2 Landscape

Essex has one of the longest coastlines of any county in England comprising complex estuary systems, extensive salt marsh and intertidal areas of international conservation importance. It has a small but active fishing fleet and, largely due to its proximity to London, has been a traditional holiday area for over a century (Essex County Council, 2005).

Large scale land reclamation has taken place over the recent past, with large areas of grazing marsh being at or below sea level. Overall the coastline is predominantly low lying and protected by earth clay flood embankments with sea facing revetment works or sea walls together with groynes. Essex has an unusual coastline, which is formed of a series of interlinked estuaries, these being the Stour and Orwell, Hamford Water, Colne and Blackwater, the Crouch / Roach and the Thames. These estuary systems are interrupted by discrete units of open coast - Walton to Colne Point, the Dengie Peninsula and the Maplin / Foulness shore. Much of the estuarine areas are dominated by muddy intertidal flats and saltmarshes, whereas in areas of open coast there is a mixture of features including London Clay sea cliffs and shingle, sandy and muddy beaches.

In places the junction between the coastal marshlands and the low hills is perceived as a gradual transition, such as the marshland at St Osyth and south-east of Maldon. Elsewhere, as at Fingringhoe, above the Mersea Flats at Cudmore Grove, and above St Lawrence Bay, the land rises more steeply to around 20m AOD, to give a distinct backdrop to the horizontal planes of the coastal marsh (Essex County Council, 2005). This topographical difference is most striking at Creeksea, where the higher land comes to the river's edge as low cliffs, and behind Bridgemarsh Island where the land rises steeply to 50m.

The undeveloped coast of Essex exhibits a strong relationship between its ecology and landscape, perhaps more than anywhere else in the county (Essex County Council, 2005). More than any other attribute apart from landform, the ecology of the coast gives it a unique and distinctive quality.

South Suffolk is geologically different from the rest of East Anglia; with crag deposits forming deep free-draining acidic sands and gravels. It gives rise to distinctive topography and land cover.

The area is a largely unspoilt mosaic of estuaries, saltmarsh, grazing marsh, reedbed, river valleys, arable, heath and woodland, with strong coastal influence, eg shingle spits and ridges resulting from longshore drift.

Stretching south from Lowestoft to the River Stour, the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) defines the landscape of south Suffolk. Characterised by flowering lanes and Suffolk pink cottages, the AONB has retained much of its unchanged character. The AONB is indented by the Blyth, Alde, Deben, Orwell and Stour estuaries. The low-lying coastal hinterland contains some of England's few remaining areas of ancient open heathland.

Conservation Areas and built heritage also contribute to the coastal landscape. These features are addressed under Historic Environment (**Section 3.3**).

Figure 3.1 **Extent of the coastline covered by the Essex and South Suffolk SMP**

L3.2.1 Soil and agricultural land quality

Soil types found along the coast of Essex and south Suffolk closely reflect the underlying drift deposits, and Tertiary London Clays and sands. The soils most commonly found along the coast are associated with marine alluviums. Such soils tend to be deep and largely clay based and tend to be found forming the marshlands of the Colne and Blackwater estuaries, the Rivers Roach and Crouch, the length of the Dengie Peninsula and Foulness as well as much of the Roach archipelago. A more silty and calcareous soil is more evident on the seaward side of Dengie and Foulness and leads to good quality soils that have been traditionally used for arable farming.

Marsh hinterlands are formed on the clay soils and loams that have developed on the London Clay and terrace gravels. Finer loamy soils are found on Mersea that have given rise to grasslands and some arable usage. Gravels underlie the well-drained, dark brown loams evident in the Tollesbury area, supporting small areas of woodland and arable and horticultural crops.

Slightly higher terrain exists above the London Clays, leading to clayey soils and where overlain by river terrace gravels, loamy soils. Clayey, frequently waterlogged soils sit on higher ground behind the marshes along the Blackwater and Crouch. In areas where London Clays and drift deposits are overlain by river terrace gravels, for example around Heybridge, in the Dengie hinterlands and between the Crouch and the Roach, good quality soils are evident supporting crops and horticultural activities. Large amounts of the gravel have been removed for commercial use.

The majority of agricultural land within the 1 in 1000 year flood zone (0.1% annual exceedance probability (AEP) of flooding) along the Essex coast is classified as Grade 3 land. Due to a favourable combination of climate and soils, subsidised production and national/international policies, the agricultural land in Essex is dominated by intensive cereal production. The location of different sectors is largely related to the distribution of soil types across the county (Essex County Council, 2006). Some of the most productive agricultural land in Essex lies on and around the Dengie peninsula (CLA, 2009).

Table 3.1 provides information relating to land classification within the 1 in 1000 year flood zone, which is graphically presented in **Figure 3.2**.

Table 3.1 Quantification of land classification within the 1 in 1000 year flood zone along the Essex and south Suffolk coastline

Land Grade	Area in hectares	Percent cover
Grade 1	838.5	2.1
Grade 2	5964.7	15.0
Grade 3	22803.9	57.4
Grade 4	5718.9	14.4
Grade 5	308.2	0.8
Non Agricultural	2284.7	5.8
Urban	1781.7	4.5

L3.2.2 Designated shellfish waters

Certain waters around the United Kingdom are designated under the Shellfish Waters Directive (2006/113/EC). Within the SMP area designated shellfish waters are presented below:

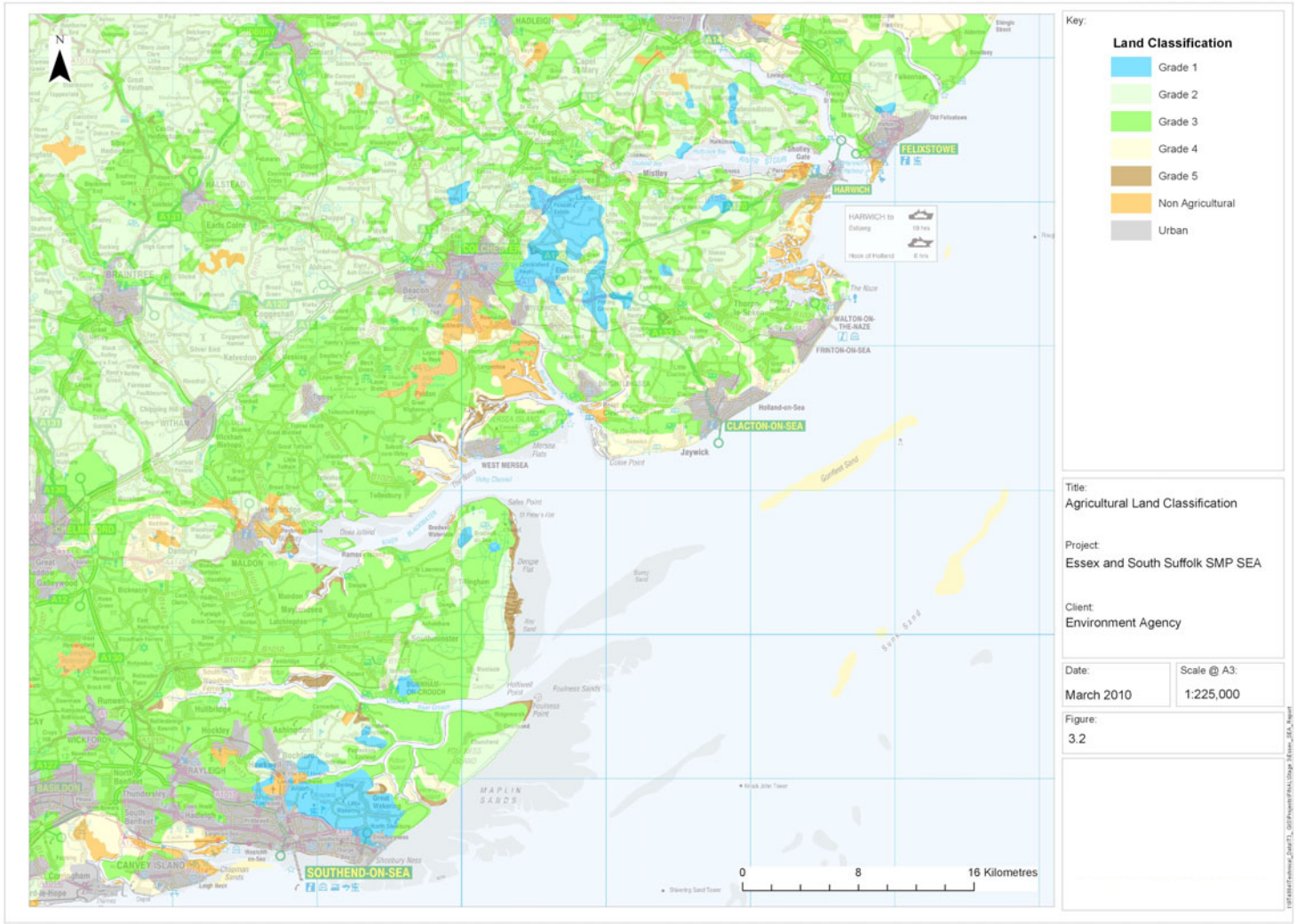
- Walton Backwaters;
- Osea Island;
- Blackwater;
- Strood Channel;
- Salcott Channel;
- Tollesbury Channel;
- Pyefleet;
- Colne;
- Dengie;
- Roach and Lower Crouch;
- Upper Crouch;
- Upper Roach;
- Foulness;
- Outer Thames; and
- Southend.

The Shellfish Waters Directive aims to protect or improve shellfish waters in order to support shellfish life and growth, therefore contributing to the high quality of shellfish products directly edible by man. It sets physical, chemical and microbiological water quality requirements for designated shellfish waters that they must either comply with ('mandatory' standards) or endeavour to meet ('guideline' standards) (Defra, 2008).

The Shellfish Waters Directive is designed to protect the aquatic habitat of bivalve and gastropod molluscs, including oyster, mussel, cockle, scallop and clam. It does not cover shellfish crustaceans such as crab, crayfish and lobster (Defra, 2008).

Safeguarding shellfisheries is a responsibility to be shared by all plans and policies to maintain the environmental quality of the area, including the SMP.

Figure 3.2 **Agricultural land classification along the Essex and south Suffolk coast.**



L3.3 The Historic Environment

In Essex there are over 300 Scheduled Monuments (SMs), of which 27 are cited by English Heritage as being at risk. Suffolk meanwhile has 325 in total, with 8 listed as being at risk (English Heritage, 2009). Although protected by law, SMs are threatened by a wide range of human activities and natural processes. SMs within the study area are presented in **Table 3.3** and **Figures 3.3 – 3.6**. In recognition of the significance and complexity of the historic environment of the Essex coast; the whole of the Blackwater estuary, and upper Crouch estuary, have recently been included on the English Heritage list of nationally significant sites as part of its *Heritage Management of England's Wetlands* initiative.

Table 3.3 Scheduled monuments within the 1 in 1000 year (0.1% AP) flood zone and the SMP study area. (MAGIC, 2009)

Name	Easting	Northing
Landguard Fort and associated field works	628452.613349	231782.541217
Area of middle and late Saxon town	616526.77499	244147.283559
Shotley Battery	625039.330501	233960.63118
Martello Tower 'L'	624830.055248	233655.768502
Ring Ditches south west of Reed Island	608621.520682	232704.46818
Napoleonic coastal battery at Bath Side, 400m west of Tower Hill	625873.712856	232441.358846
Harwich Lighthouse	626116.041222	232436.962
The Harwich Treadwheel Crane	626215.181816	232468.603682
The Dovercourt Lighthouses and causeway	625384.588263	230822.020861
Beaumont Quay, Hamford Water: 19th Century quay & lime kiln	618964.772389	224004.877658
Martello Tower 'K' and associated battery south west of Walton Mere	625078.16506	222007.128186
Martello Tower 'K' and associated battery south west of Walton Mere	625149.124419	222048.167563
Lion Point Decoy 810m SE of Cockett Wick Farm	613941.065847	213291.882531
Martello Tower 'C', St Osyth Beach, Clacton-on-Sea	613618.313692	212752.986822
Martello Tower 'A' & associated battery, Stone Point	608299.517748	215691.959609
Martello Tower 'A' & associated battery, Stone Point	608235.812851	215669.78953
Coastal Fish Weirs at West Mersea, 570m south of St Peter's Wall	600995.320932	211931.420825
Coastal Fish Weir at northern end of the Nass	599953.799625	211038.435533
Square Decoy Pond 260m south of Pennyhole Fleet, Old Hall Marshes	598661.893456	211804.663933
Decoy Pond immediately north of Pennyhole Fleet, Old Hall Marshes	598280.540836	212339.328615
Gore Decoy 760m south of East Lauriston Farm	592600.224062	208247.758999
Mound E of Basin Road	587165.93785	207514.433412
Coastal Fish Weir 440m North West of Pewet Island	598750.7171	208132.961674
Saxon Coastal Fish Weir	603354.586317	209376.442142
Saxon shore fort and Anglo-Saxon monastery, Bradwell-on-Sea	603117.033578	208188.311166
Decoy Pond 700m north of Marsh Farm House	601942.573663	204201.393608
Medieval Saltern adjacent to Hawbush Creek	582338.011299	196297.468501
Romano-British burial site on Foulness Island	597910.18613	190520.399983

As well as SMs, a number of areas within the SMP2 study area are identified for the conservation value of their built environment. These are identified in **Table 3.4** below.

Table 3.4 Conservation areas along the Essex and south Suffolk coast and lying wholly or partially within the SMP study area.

District Council	Conservation area
Tendring District Council	Brightlingsea
	Brightlingsea Hall and All Saints Church
	Clacton Sea Front
	Frinton
	Harwich
	Manningtree & Mistley
	Thorpe-le-Soken Station and Maltings
Maldon District Council	Burnham on Crouch
	Goldhangar
	Heybridge basin
	Langford
Colchester District Council	Wivenhoe
Rochford District Council	Foulness Churchend
	Great Wakering
	Paglesham East End
	Paglesham Church End
	Rochford
Southend Borough Council	Leigh OId Town
	Seafront
	Shoebury Garrison

Figure 3.3 Historic Environment map for the study area between Landguard Point and Little Oakley

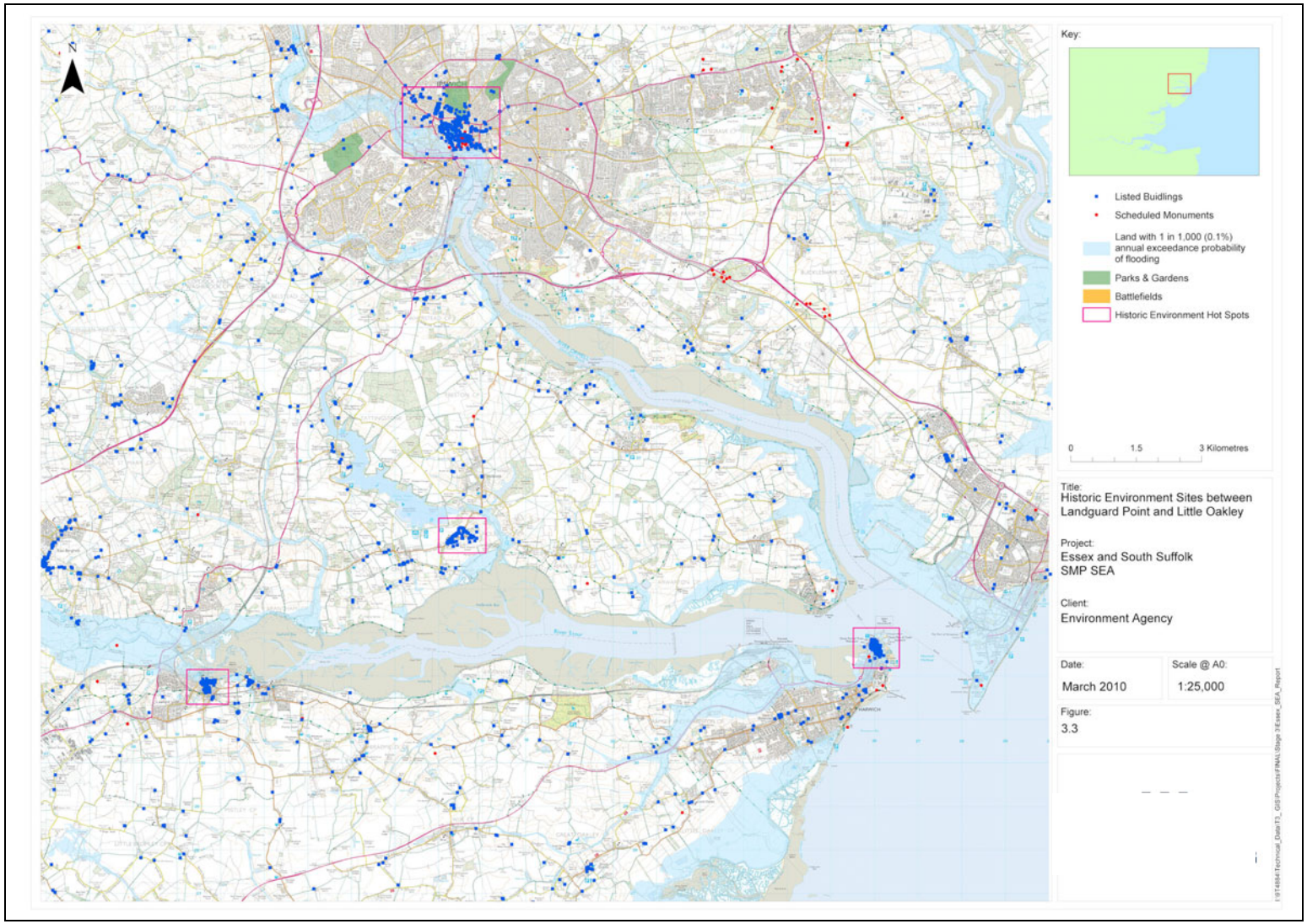


Figure 3.4 **Historic Environment map for the study area between Little Oakley and West Mersea**

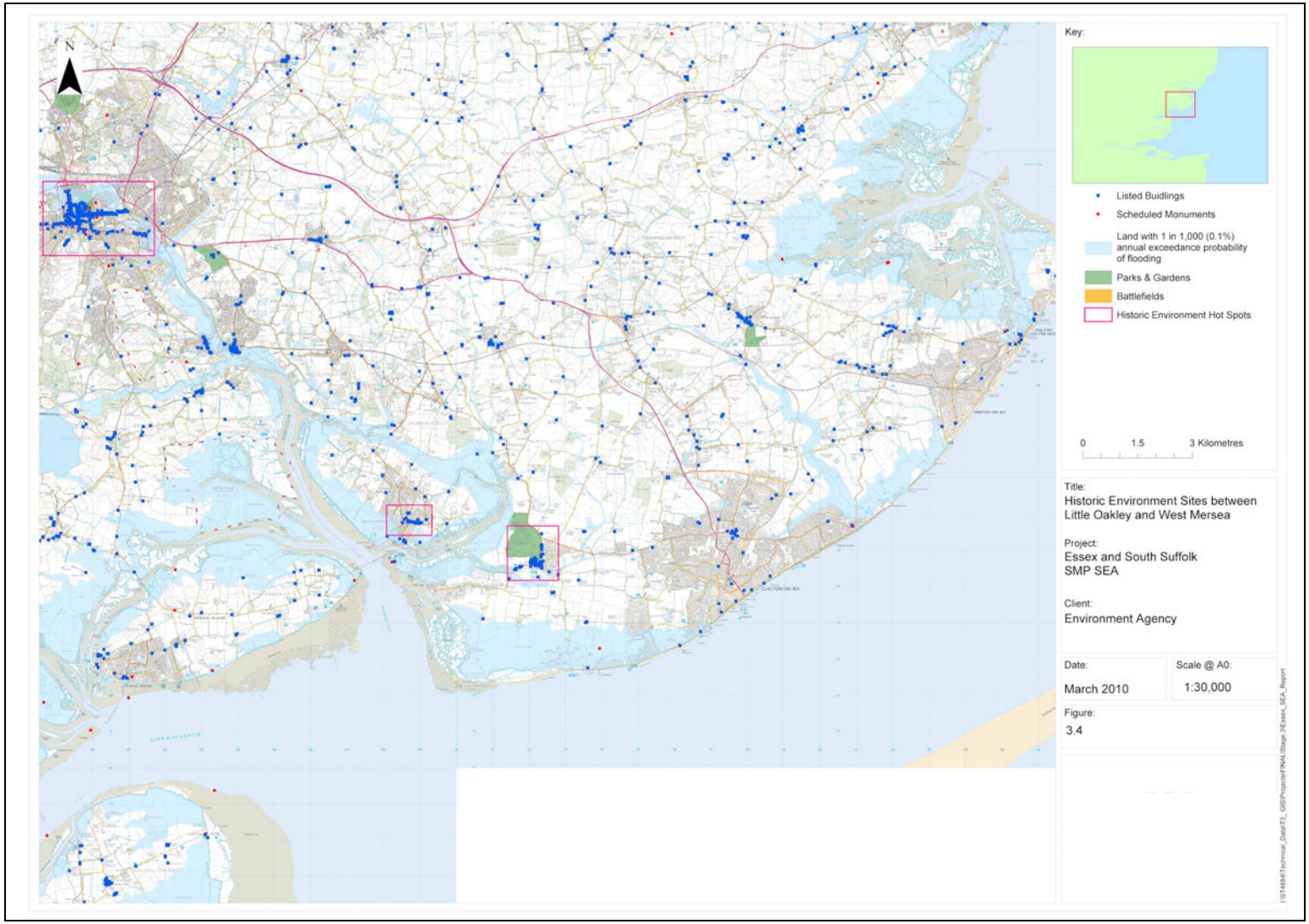


Figure 3.5 **Historic Environment map for the study area between West Mersea and Burnham-on-Crouch**

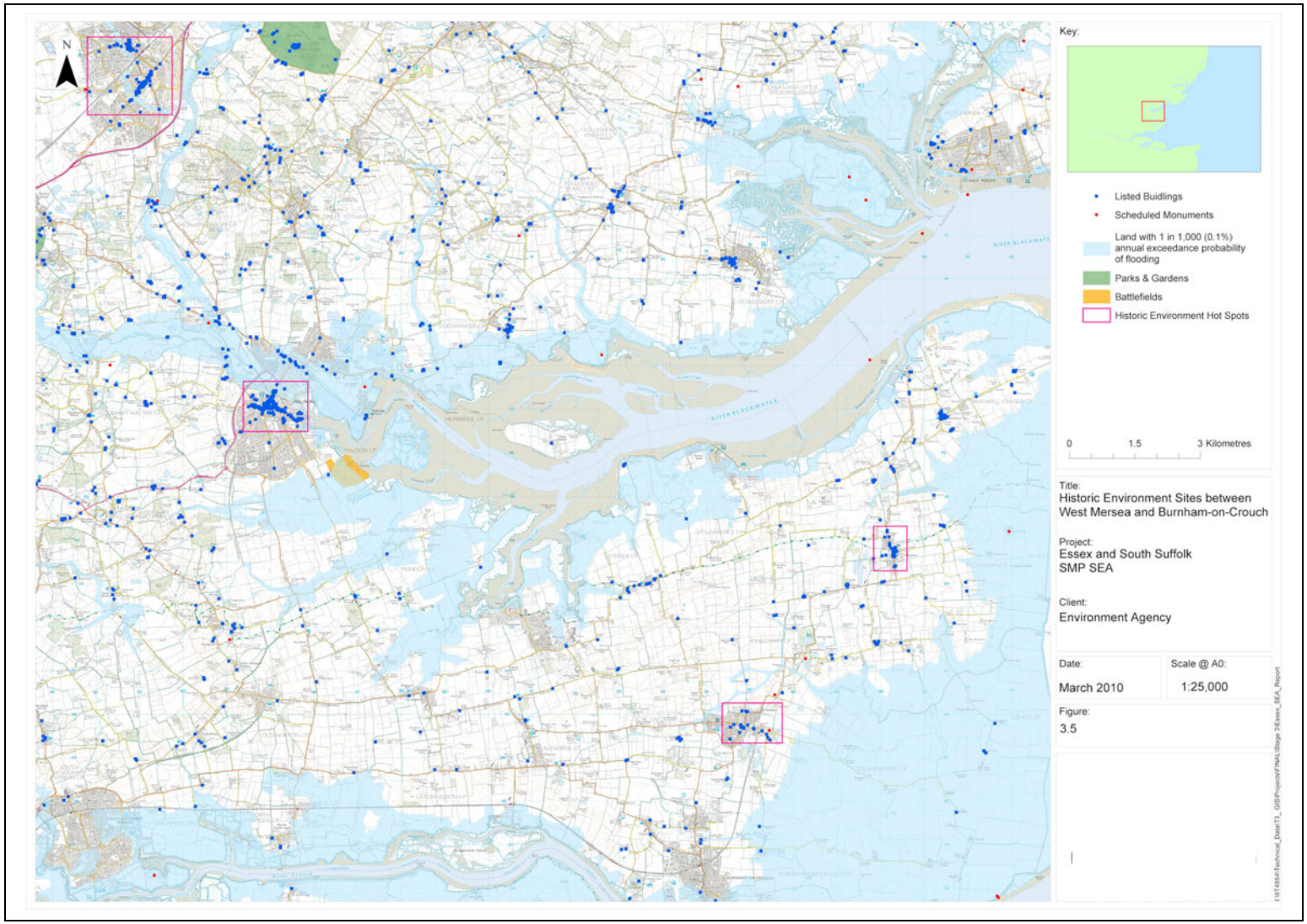
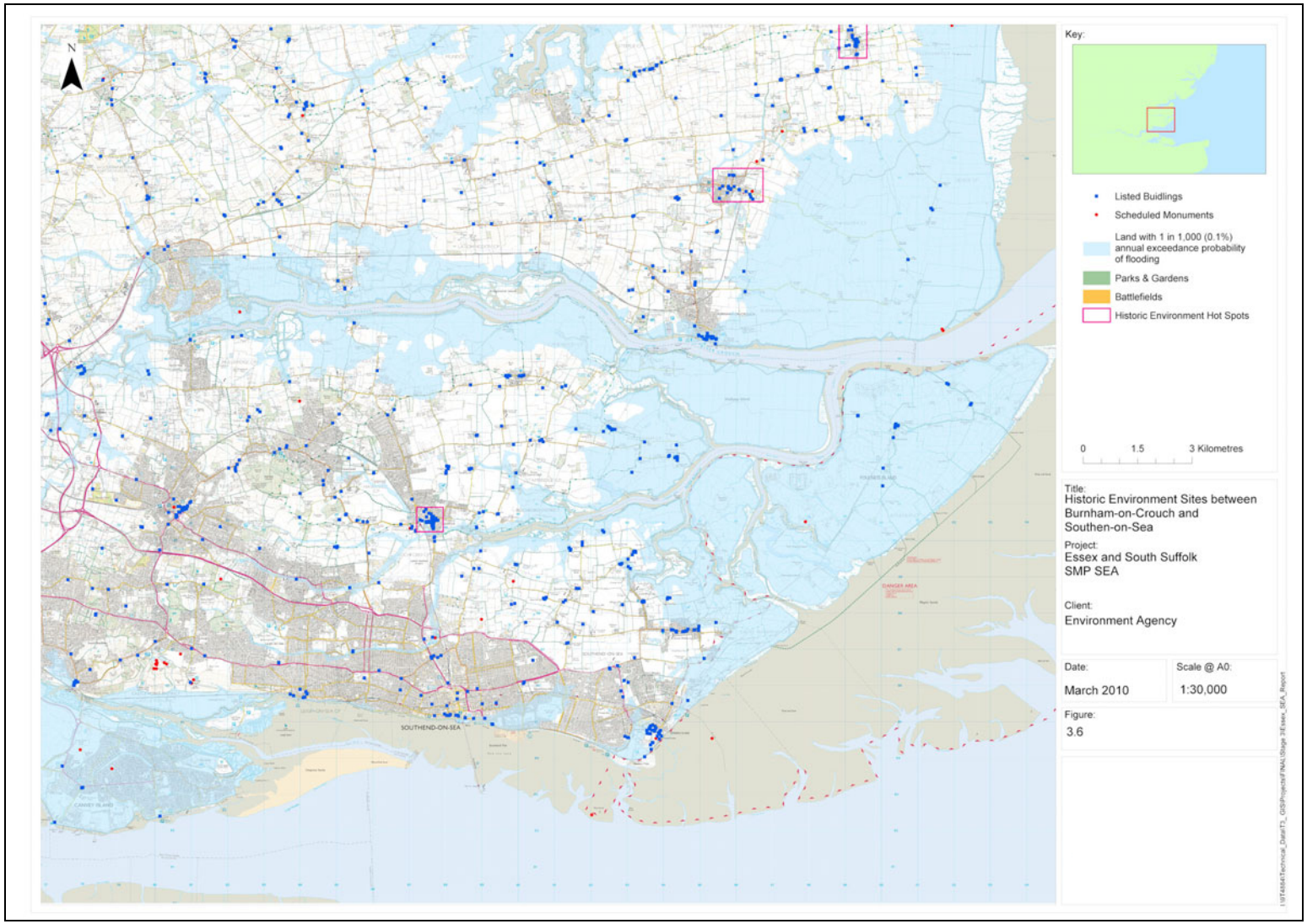


Figure 3.6 **Historic Environment map for the study area between Burnham-on-Crouch and Southend-on-Sea**



L3.4 Habitats and species

L3.4.1 Statutory International Designations

The largely undeveloped Essex and south Suffolk coast is home to a wide range of both marine and terrestrial species and habitats and is of particularly high conservation value. Sections of coastline are suffering from 'coastal squeeze' where the intertidal zone is trapped between the coastal defence (flood bank or sea wall) and rising sea levels. As a result many of the salt-marshes are in decline, exposing the defences to increased wave attack. Each of these habitats supports a range of species of high conservation value, including birds, plants and invertebrates. The high conservation value is reflected in the fact that the majority of the coastline is subject to statutory nature conservation and landscape designations. These designations have important implications for any prospective developments, management or policies relating to the Essex and south Suffolk Coast.

Habitats and species are the basis of statutory conservation designations. However, as the designations are derived from discrete and different pieces of legislation, the nature and mechanisms of protection vary. The inherently dynamic nature of coastal environments and the potential for flood risk management structures and practices to both constrain (e.g. by holding or advancing the line) and create (e.g. from NAI or MR) habitat ensures that SMP policy has a significant bearing on both natural habitats and designated sites. All internationally designated sites within the study area (either coastal sites or within the 1 in 1000 year coastal flood zone) are presented in **Table 3.5** and shown in **Figure 3.7**.

Table 3.5 Internationally designated sites within or adjacent to the study area

International designation	Designating legislation	Site name	Area (ha)
Ramsar	Ramsar Convention	Stour and Orwell Estuaries	3,672.64
		Hamford Water	2,185.76
		Colne Estuary	2,713.99
		Crouch and Roach Estuaries	1,745.11
		Blackwater Estuary	4,395.15
		Dengie	3,134.01
		Benfleet and Southend Marshes	2,283.96
		Foulness	10,942.13
		Abberton Reservoir	726.2
Special Area of Conservation (SAC)	Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive)	Essex Estuaries	46,109.95
Special Protection Area (SPA)	Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive)	Stour and Orwell Estuaries	3,672.64
		Hamford Water	2,185.76
		Colne Estuary	2,719.93
		Blackwater Estuary	4,403.40
		Dengie	3,134.01
		Benfleet and Southend Marshes	2,283.96
		Foulness	10,942.13
		Abberton Reservoir	726.2

L3.4.2 Statutory National Designations

The coastline and surrounding hinterland that form the study area also contain sites designated under national legislation. These are presented in **Table 3.6** and **Table 3.7**, showing Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR) respectively, and illustrated in **Figure 3.8**.

Table 3.6 SSSIs located within the Essex and South Suffolk SMP study area.

SSSI name	Area (ha)
Landguard Common	30.49
Orwell Estuary	1335.52
Stour Estuary	2248.01
Cattawade Marshes	89.22
Stour and Cooperas Woods, Ramsey	78.17
Harwich Foreshore	10.32
Little Oakley deposit channel	2.95
Hamford Water	2185.76
The Naze	24.06
Holland Haven Marshes	210.63
Holland On Sea Cliff	0.09
Clacton Cliffs and Foreshore	26.28
Colne Estuary	2986.46
St Osyth Pit	0.06
Upper Colne Marshes	113.19
Blackwater Estuary	4403.46
Dengie	3132.43
Sandbeach Meadows	29.38
Foulness	10946.14
Crouch and Roach Estuaries	1745.98
Benfleet and Southend Marshes	2373.68

Table 3.7 NNRs located within the Essex and South Suffolk SMP study area.

NNR name	Area (ha)
Blackwater Estuary	1031
Colne Estuary	576
Dengie	2366
Hamford Water	1448
Leigh	257

Further designations for nature conservation value exist at the county and local scale (for example County Wildlife Sites and Local Nature Reserves). However these have not been formally considered within the SEA or SMP2 because it was considered that the strategic nature of SMP policy is more appropriately assessed in regard to sites of national and international importance.

Figure 3.7 Internationally designated sites on the Essex and south Suffolk coastline

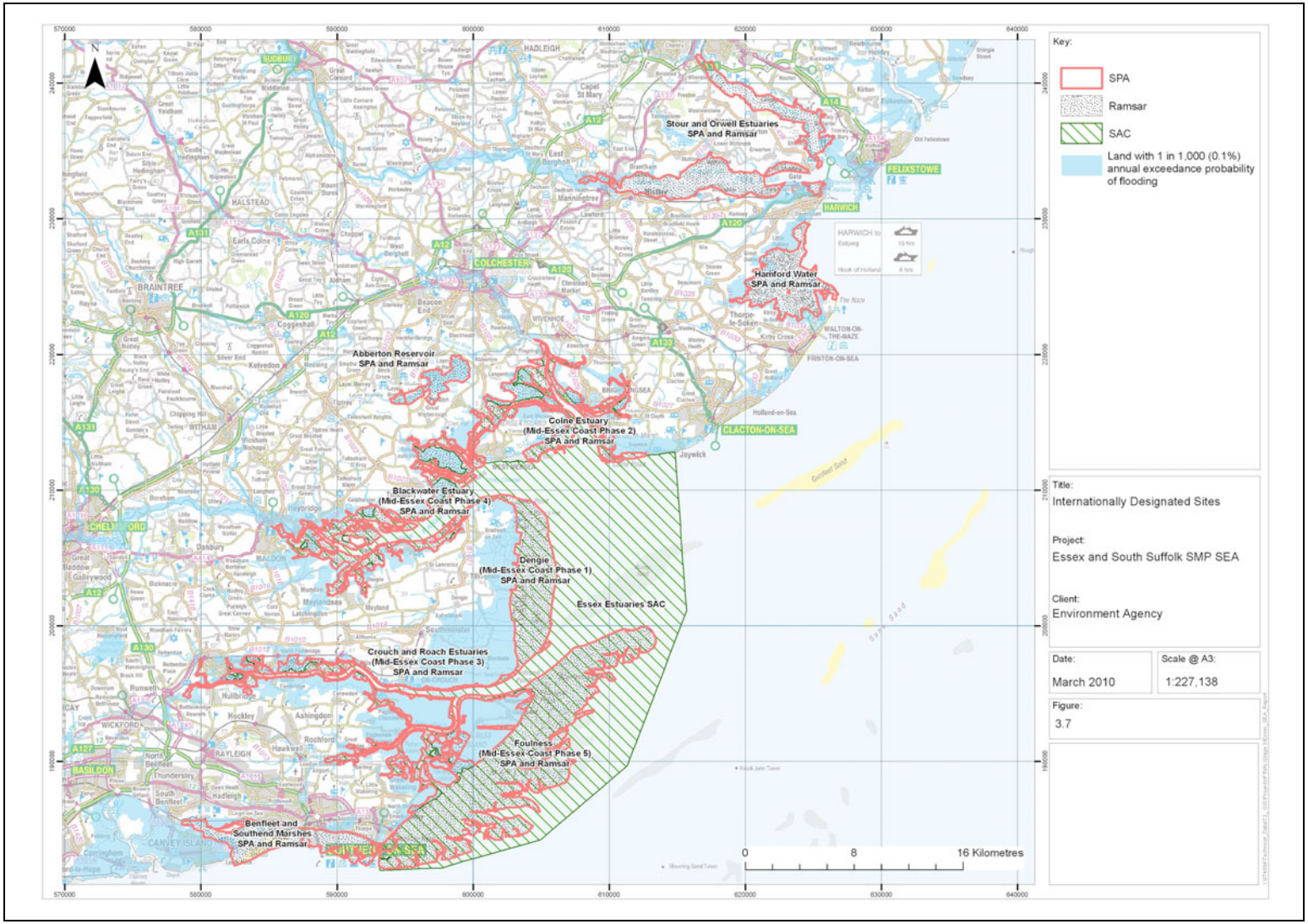
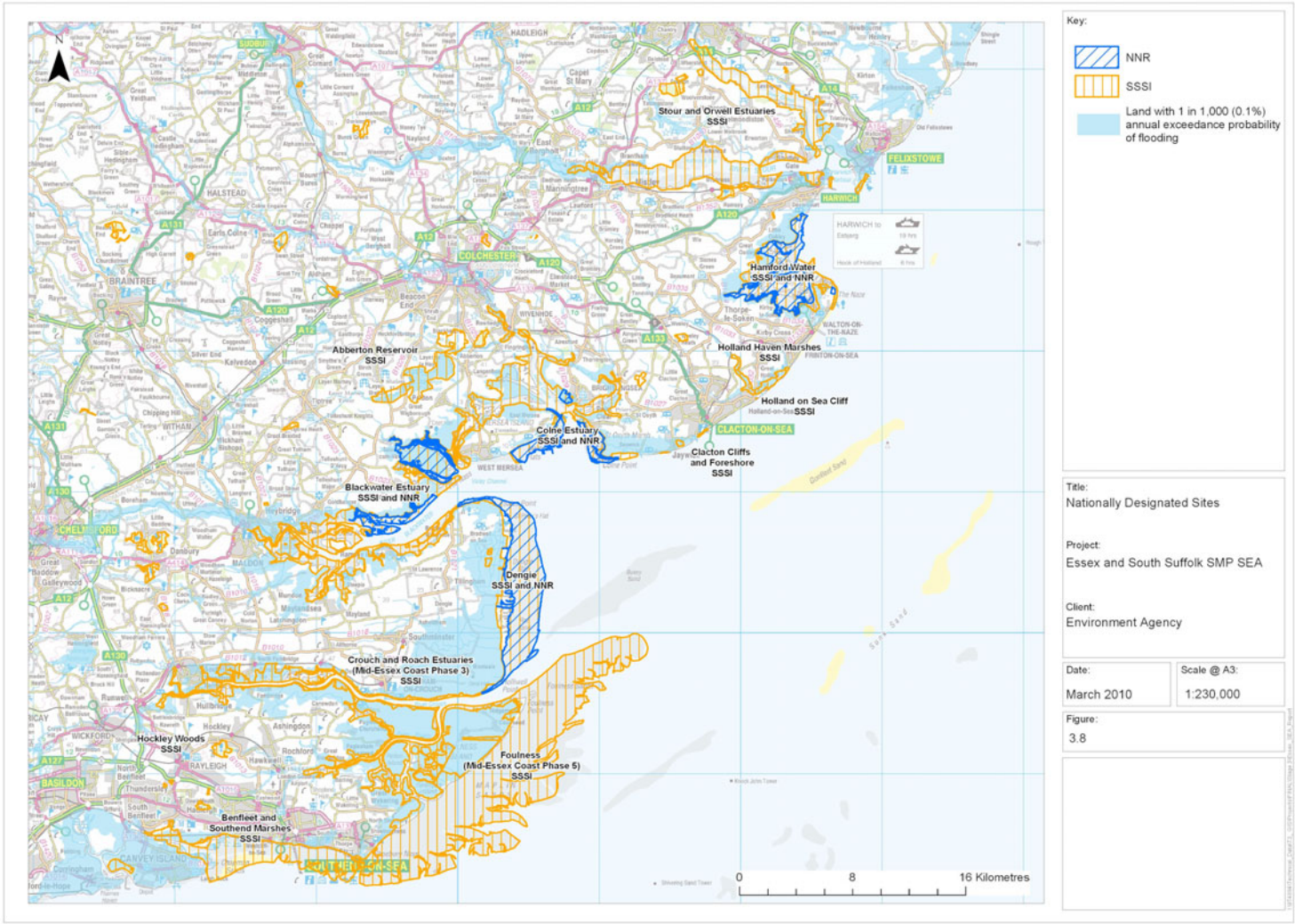


Figure 3.8 Nationally designated sites on the Essex and south Suffolk coastline



L3.5 Key tourism features

Key tourism features along the Essex and South Suffolk coast SMP study area are listed in **Table 3.8.** The key features which support tourism relate to the high quality coastal environment, a ribbon of attractive historic settlements with active coastal communities, and the opportunity to observe a variety of bird and mammal species. The reason for the buoyancy and sustainability of tourism on the Essex and south Suffolk coast is the unique combination of these features, which appeal to a wide cross section of society.

Table 3.8 Key tourism features along the Essex and south Suffolk coast and within the SMP study area

Location	Attraction
Suffolk Coast and Heaths AONB	Stretching south from Lowestoft to the River Stour, the AONB protects heathland, reed beds, salt-marsh and mud-flats, a rich mixture of unique and vulnerable lowland landscapes.
Ipswich	Suffolk's county town
Dedham Vale AONB	AONB protects an exceptional example of a lowland river valley. The designated area of the AONB stretches upstream from Manningtree to within one mile of Bures.
Stour Estuary RSPB Reserve	Popular site for birdwatchers. The site receives a large number of migratory birds in the autumn and large flocks of feeding birds in the winter.
Brightlingsea	Blue flag beach. Popular tourist destination in the summer. Yachting activities are widespread in the area.
Southend-on-Sea	Important tourist destination. Southend-on-Sea has 3 blue flag beaches. There are also adventure parks, nature reserves, museums and galleries.
Clacton-on-Sea	Clacton has a pleasure pier, arcades, a golf course and caravan parks. The beaches are popular with tourists in the summer.
Old Hall Marshes RSPB Reserve	Extensive grazing marshes with brackish water fleets, reedbeds, saltmarsh and two offshore islands. In winter, thousands of wildfowl come here and in the summer the sight is popular for its breeding waders.

L3.6 Critical infrastructure

Critical infrastructure within the Essex and South Suffolk coast SMP study area is listed in **Table 3.9** below. Settlements such as Felixstowe, Ipswich and Clacton have high quality road and, in the case of Ipswich, rail infrastructure links. Transport infrastructure in the southern part of the study area (excluding Southend-on-Sea) is less significant. Felixstowe Port is one of the largest container terminals in Europe, and Bradwell nuclear power station sits on the south shore of the Blackwater Estuary.

Critical infrastructure is also indicated on **Figures 3.9** to **3.15** below.

Table 3.9 Critical infrastructure within the Essex and South Suffolk SMP study area

Critical Infrastructure	Description
A154	Road which links the port of Felixstowe to the A14. Important route for commercial usage.
A14 (T)	Vital road linking Felixstowe peninsula to Ipswich and the rest of the country, but very prone to congestion due to lack of alternate routes.
A137	Connects Ipswich to Colchester. Not a major route but is used to get to smaller settlements such as Manningtree.
A120	Main road leading into Harwich, important route for holidaymakers using the port.
A414	Connects Maldon to Chelmsford, but not a heavily used route.
A132	Small road that connect South Woodham Ferrers to the A130 which leads to Southend-on-Sea. Not a heavily used route.
Harwich International Port	Multipurpose port, primarily involved with ferry operations.
Felixstowe Port	The largest container port in the UK and 5th largest in Europe, employs over 2,700 people. The port is recognised as a strategic employment site of regional and national importance.
Railway line between Burnham-on-Crouch and South Woodham Ferrers	Railway connects small settlements together, ultimately leading to Southend-on-Sea. Not on the main route so mainly used by commuters/local people.
Railway line in Manningtree and Harwich	This railway connects Manningtree to Harwich and thus connects Harwich to the rest of the country. This rail link connects to the port which is a key destination for holidaymakers going abroad.
Railway and freight line in Southend-on-Sea	The railway connects Southend-on-Sea to London. Easy access route for tourists.
Railway line into Felixstowe port	Important commercial link for businesses to the port.
Railway in Ipswich	Connects Ipswich to Norwich and Cambridge.
Bradwell nuclear power station	Provides electricity for the national grid and has a lifespan within epoch 1.

Figure 3.9 Critical infrastructure around the Essex and south Suffolk coast

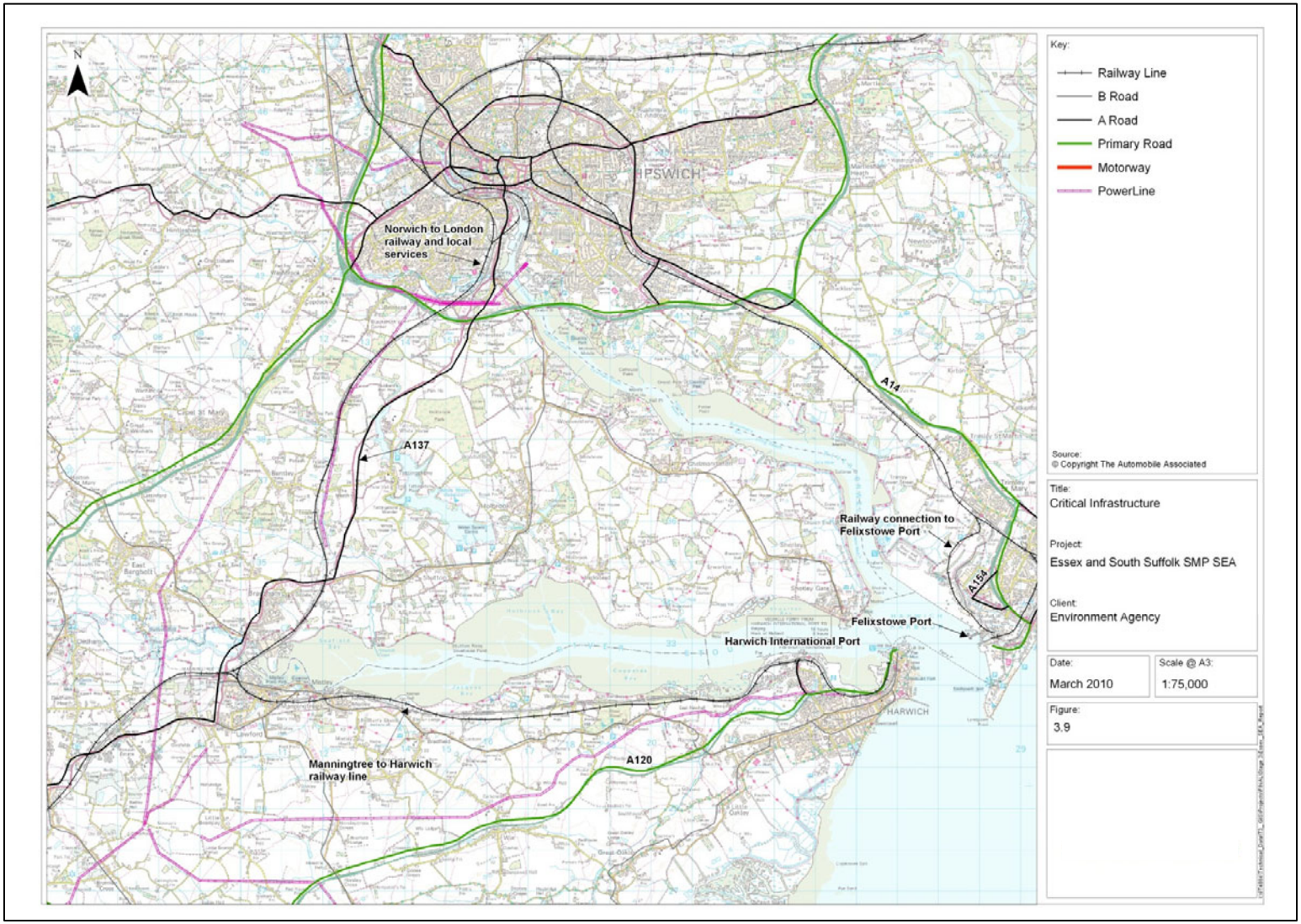


Figure 3.10 Critical infrastructure around the Essex and south Suffolk coast

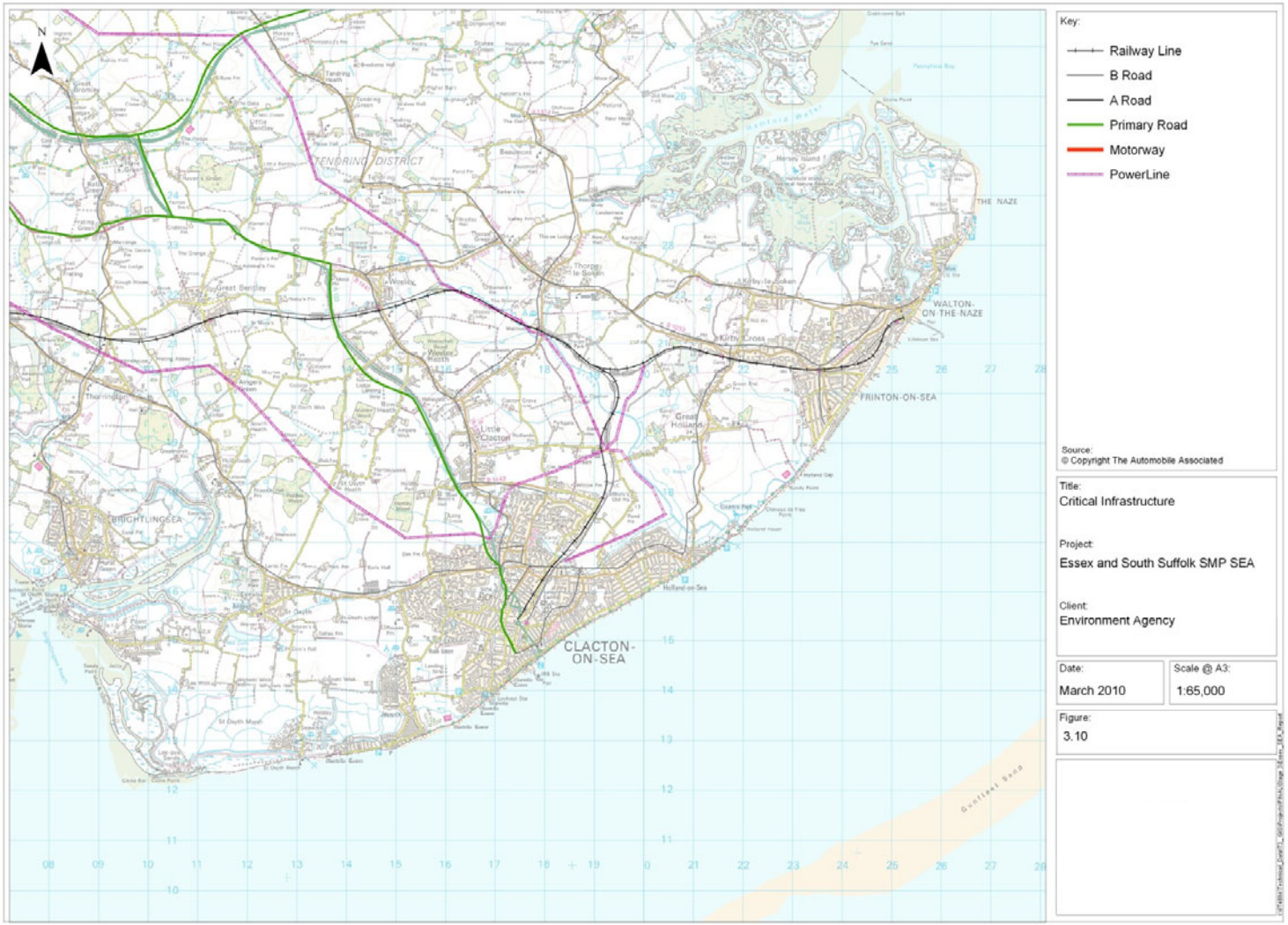


Figure 3.11 Critical infrastructure around the Essex and south Suffolk coast

Figure 3.12 Critical infrastructure around the Essex and south Suffolk coast

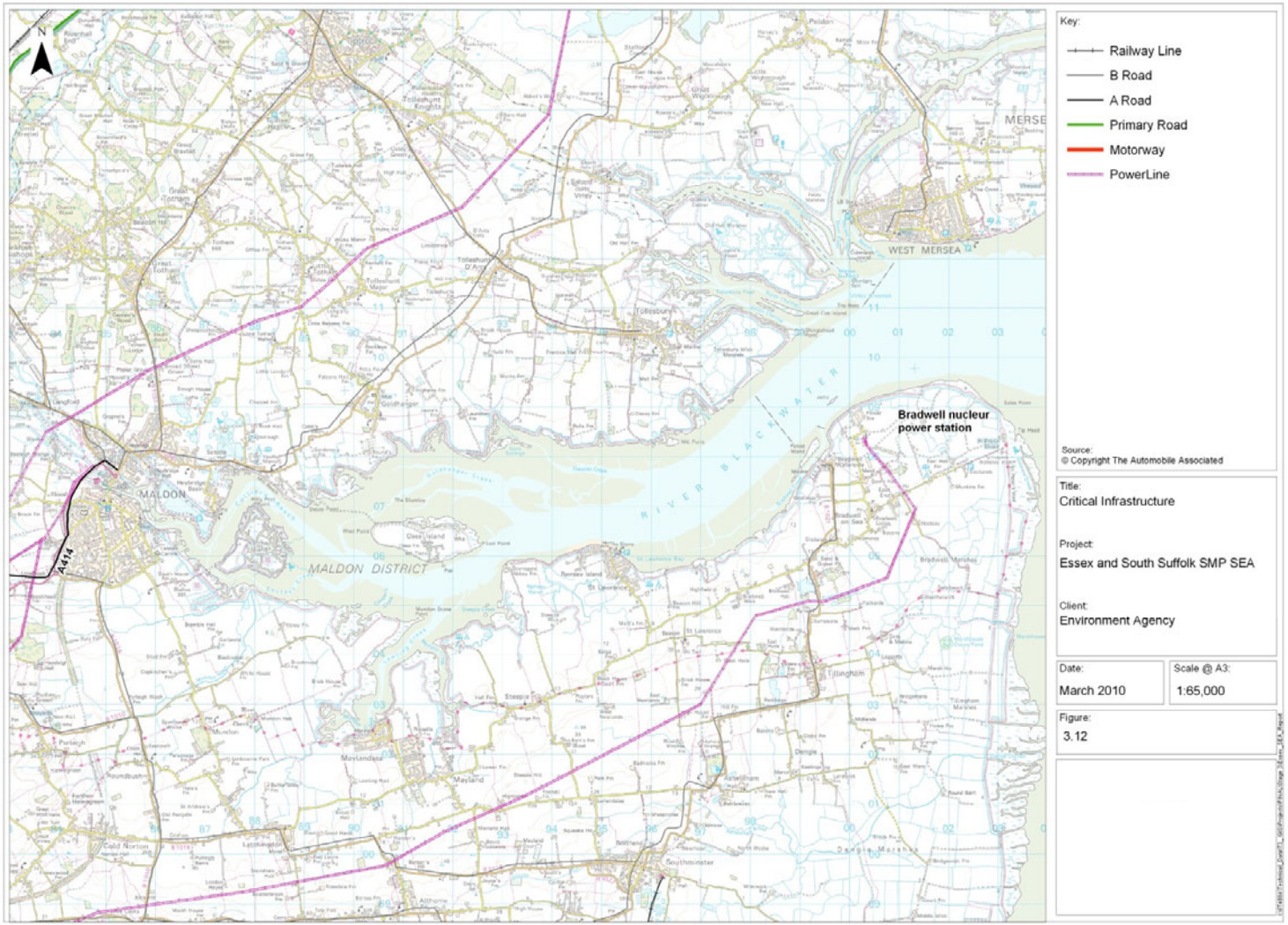


Figure 3.13 Critical infrastructure around the Essex and south Suffolk coast

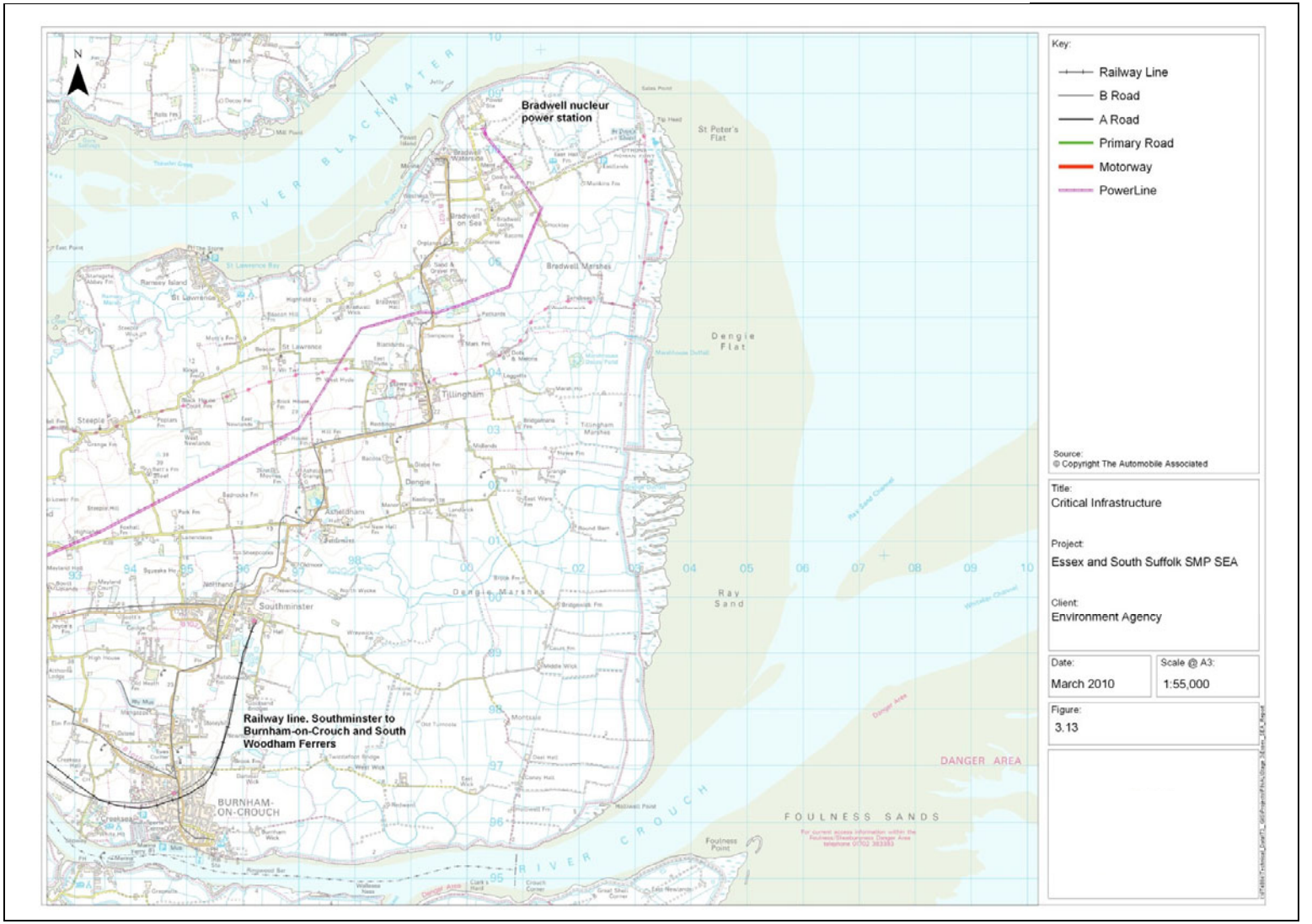


Figure 3.14 Critical infrastructure around the Essex and south Suffolk coast

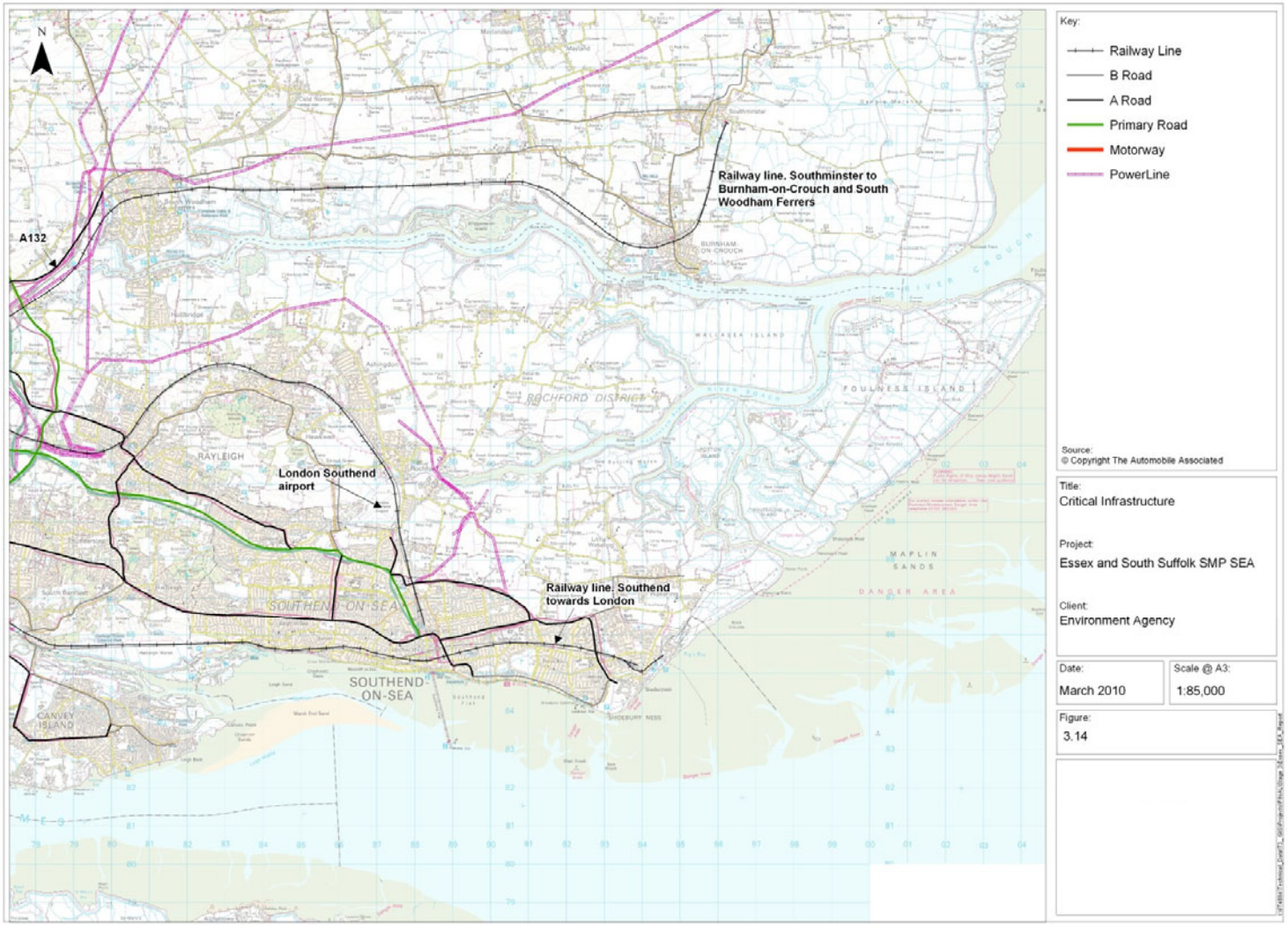
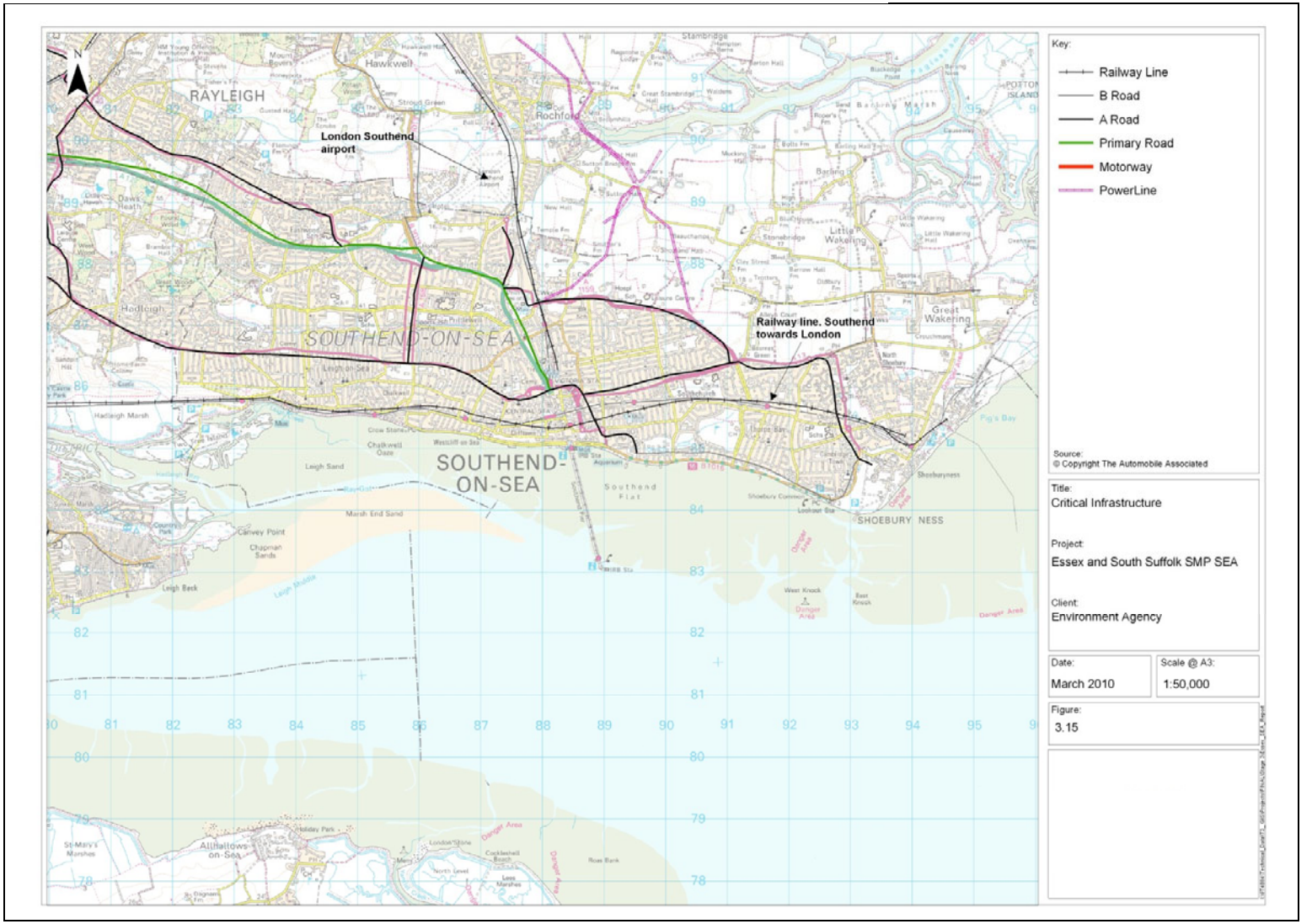


Figure 3.15 Critical infrastructure around the Essex and south Suffolk coast



L3.7 Water quality and supply

River catchments within the Essex and South Suffolk SMP study area comprise of the rivers Orwell, Stour, Colne, Blackwater, Crouch and Roach. The 'upstream boundaries' of the SMP in the estuaries have been selected to match the downstream boundaries of the East Suffolk, the North Essex, and the South Essex Catchment Flood Management Plans (CFMPs), as detailed in the SMP

The SMP develops shoreline management policies up to and including the outfall structures, taking into account their role in protecting the river valleys against tidal flooding. The role of the outfall structures as a downstream boundary for the rivers has been included in all three CFMPs. This includes the issue of tide locking (high tide levels limiting river outflow which can cause river flooding).

The Anglian River Basin Management Plan (RBMP) was produced in December 2009 and encompasses the Essex and South Suffolk SMP area. It shows the current state of the water environment, and what actions will be taken to address identified pressures on the water bodies.

Within the RBMP, the Essex Rivers area lies within the counties of Essex and Suffolk as well as a small part of Cambridgeshire. It includes the rivers and tributaries of the Stour, Colne, Blackwater, Crouch and Roach. The rivers Stour, Orwell and Blackwater have been identified as suffering from diffuse water pollution caused by agriculture, and actions have been put in place to minimise this impact.

Two groundwater protection zones lie within the SMP area, one along the River Orwell around Ipswich and the other along the River Stour to the west of Manningtree. The groundwater protection zones are limited in extent and therefore SMP policy is unlikely to have a significant impact upon these areas.

Licensed abstraction information for the Essex and south Suffolk coastline is presented in **Figures 3.16** – **3.19**. There are numerous abstraction points in the flood zone along the coast. However they do not need to be restricted to a coastal location and could be moved to more landward locations (if required by coastal policy or processes) without any risk to interruption of the water supply.

Figure 3.16 Licensed Abstraction locations on the Essex and south Suffolk coastline (Section 1)

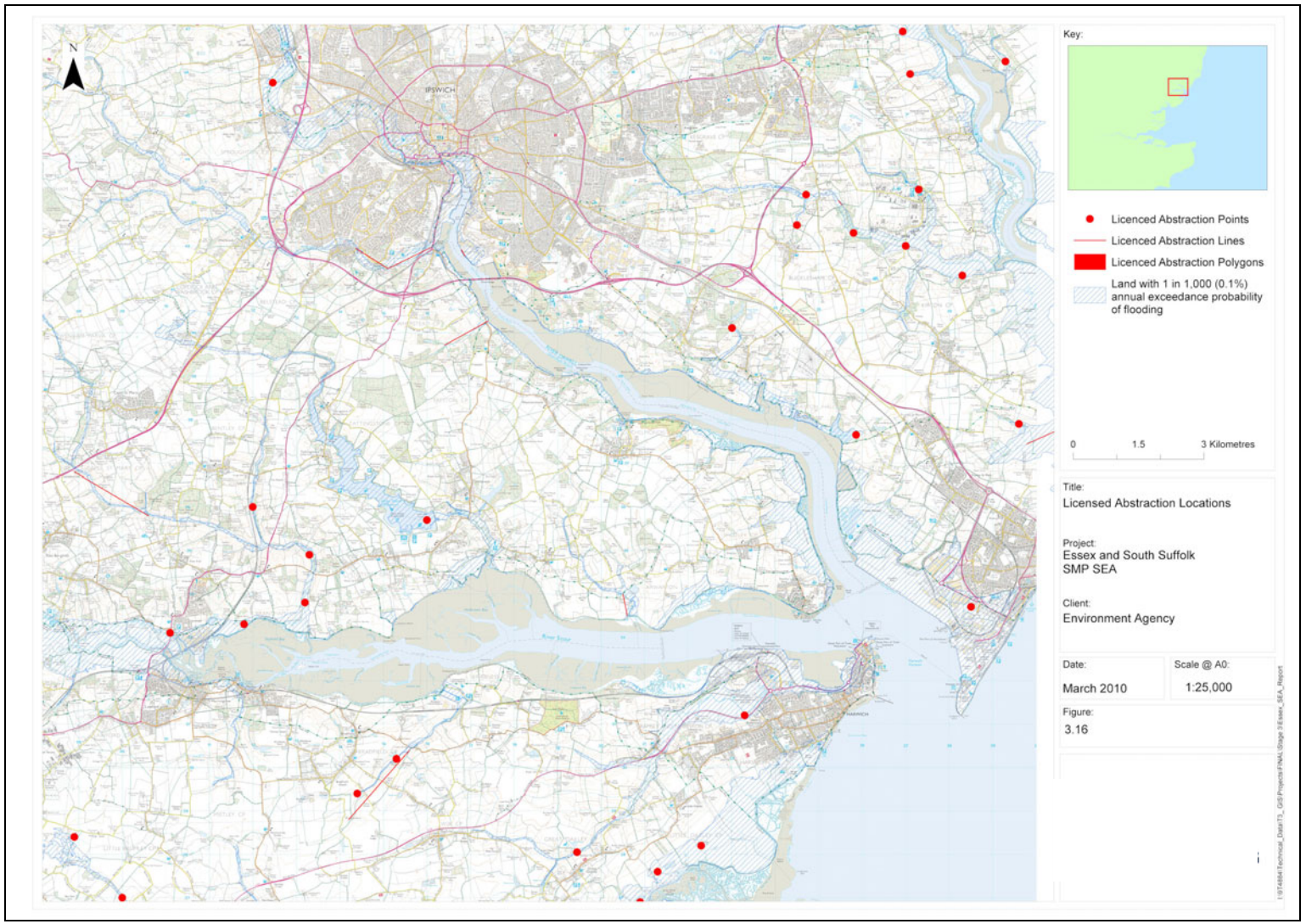


Figure 3.17 Licensed Abstraction locations on the Essex and south Suffolk coastline (Section 2)

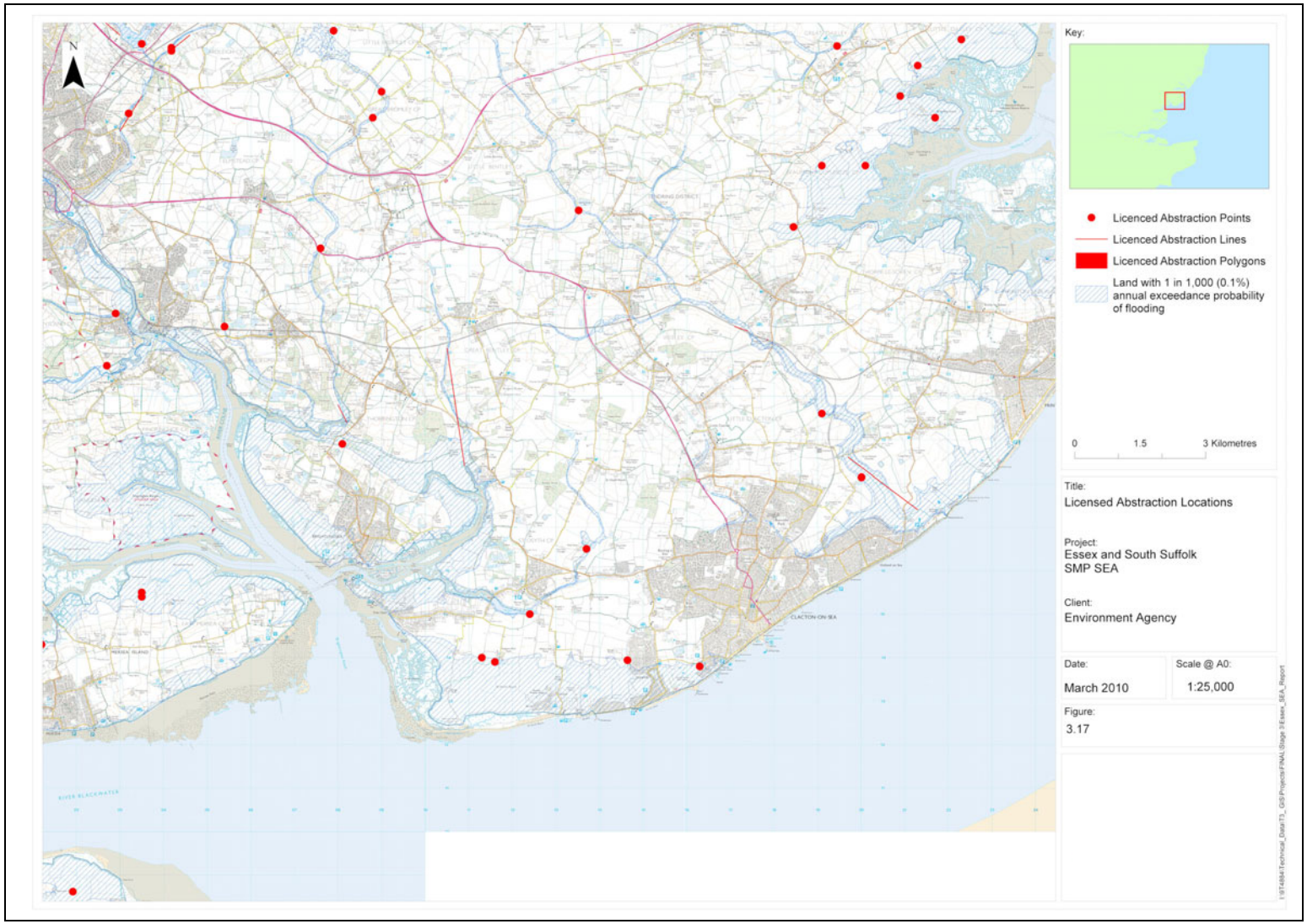


Figure 3.18 Licensed Abstraction locations on the Essex and south Suffolk coastline (Section 3)

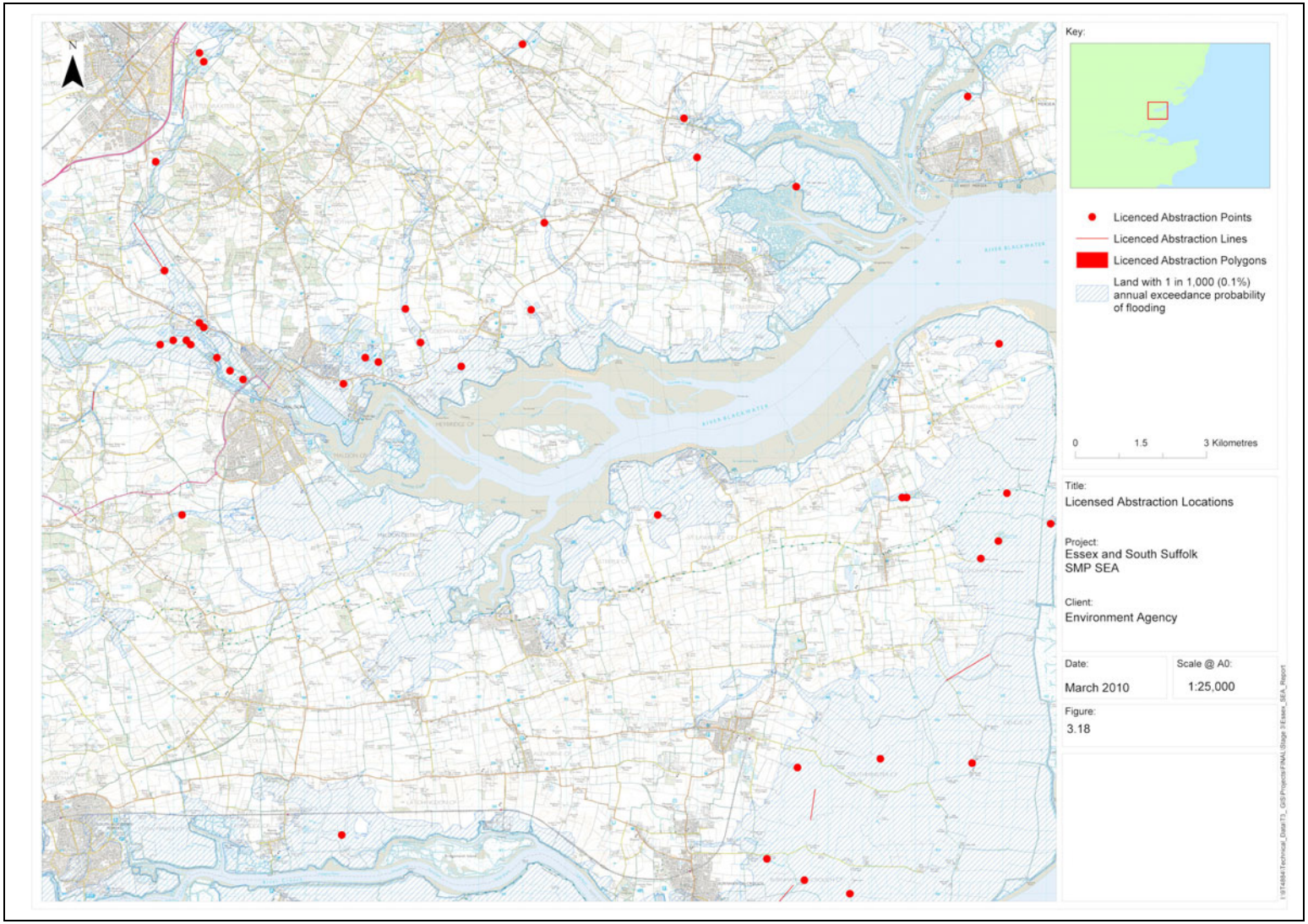
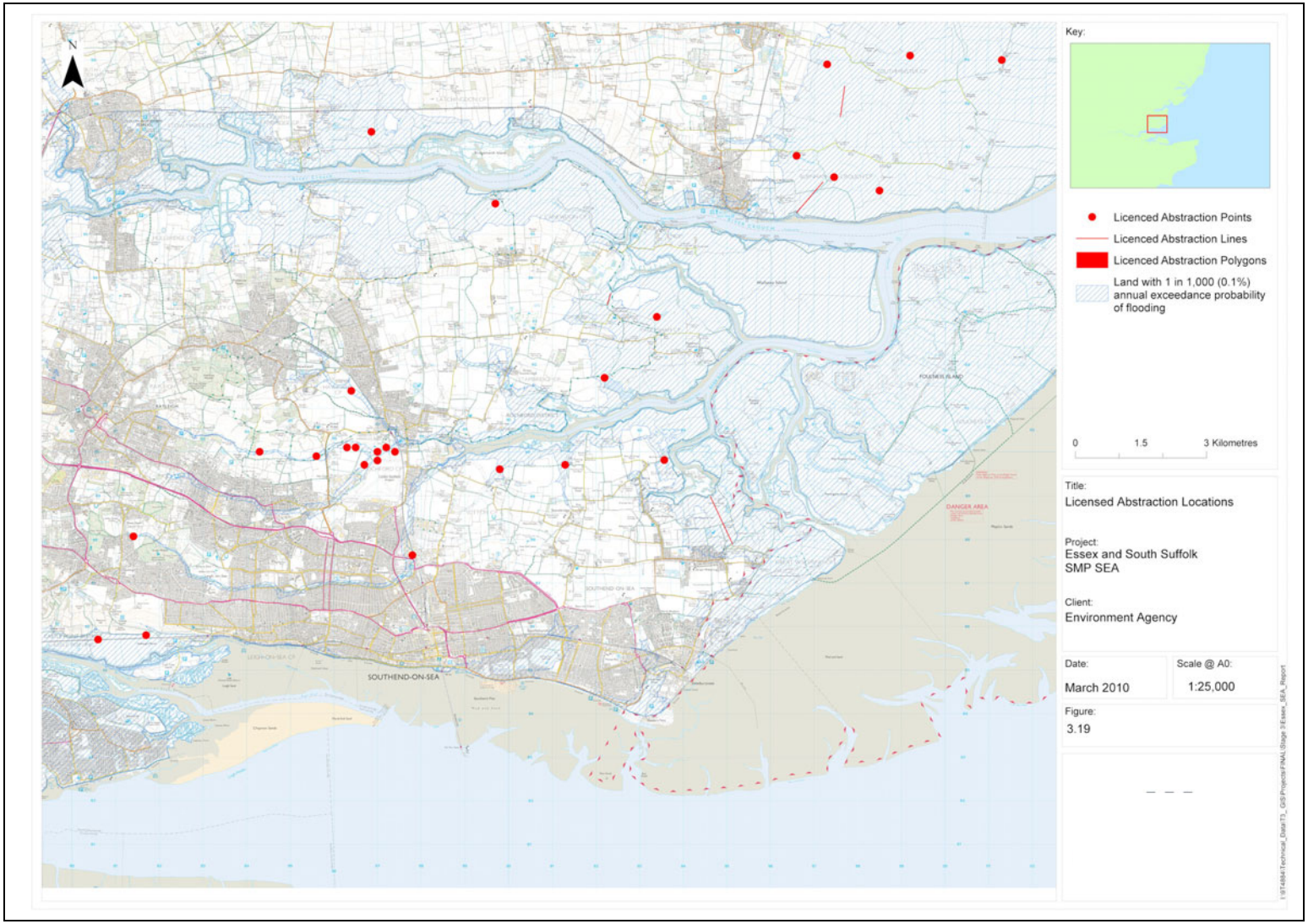


Figure 3.19 Licensed Abstraction locations on the Essex and south Suffolk coastline (Section 4)



L4 ENVIRONMENTAL ISSUES

L4.1 Environmental Issues

As defined previously in **Section 3**, from a consideration of the policy, legislation and designations relevant to the Essex and south Suffolk coast, and supported by discussions with key stakeholders as part of the SMP process, a series of environmental issues have been identified. These issues are an expression of the problems which the SMP needs to address in the delivery of providing policy for shoreline management. The issues suite, shown in the table below, has been developed to avoid a reliance on generic coastal management issues, although some issues are the same around the coast and are therefore included. The identified suite of issues takes into account the most critical environmental issues on the Essex and south Suffolk coast as identified by other plans, management obligations and stakeholders.

The suite of issues provided is as follows:

1. **The need to maintain a balance of providing navigation and access to estuary communities;**
2. **Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce;**
3. **Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast;**
4. **Potential loss of historic and archaeological features on a dynamic coastline;**
5. **Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types;**
6. **Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries;**
7. **Maintenance of water supply in the coastal zone;**
8. **Threat to the environmental conditions to support biodiversity and the quality of life; and**
9. **Maintenance of coastal processes required for sustainable coastal management and the integrity of critical coastal habitat and species.**

In response to each specific issue a series of assessment criteria have been developed, which will ensure that the assessment of SMP policy is focussed on the key environmental issues in this area. The criteria are listed under each issue in the assessment table provided in **Annex I**. This table provides an account of how each issue provides the focus for the environmental assessment of the SMP, in a manner specific to the Essex and south Suffolk coast.

L4.2 The effect of other plans in combination with the SMP

The other plans which need consideration in regard to the SMP, and this strategic environmental assessment relate to the provision of land use plans in the plan area. Based on a consideration of the content of existing plans and emerging documents as part of the Local Development Frameworks (LDFs), no examples were identified in regard to common effects. The plans support the maintenance of coastal settlements, community infrastructure and the wider environment. These principles are entirely

consistent with the objectives of the SMP, and no examples could be found where local policy would provide additional environmental effects in addition to those of the SMP.

The following plans were considered, but not identified as having in-combination effects with the effects of the SMP:

- *Suffolk Coastal Local Plan*
  The current Suffolk Coastal Local Plan was adopted by the Council in 1994 and subject to a First Alteration which was adopted in 2001. A Second Alteration, dealing specifically with affordable housing, came into effect on 31 March 2006. Suffolk Coastal is drawing up a new LDF. On Thursday 18 March 2010 the Core Strategy and Development Management Policies document was approved.

- *Tendring District Local Plan*
  Tendring District has a District Local Plan which, following a Public Inquiry, was adopted by the Council on 11 December 2007 covering the period up to 2011. In May 2009 Tendring District Council consulted the public, the development industry, community representatives and any other interested parties on how the district should grow between now and 2026. This is the first stage of community engagement on the Council's Local Development Framework - Core Strategy.

- *Colchester Borough Local Plan*
  The current Local Plan, the Adopted Review Colchester Borough Local Plan (March 2004) is saved until 2011, or until it is replaced in whole, or part, by the Local Development Framework (LDF) documents as they are produced. In December 2008 the Council adopted the Core Strategy document which provides the overarching strategy and policy direction for the growth of the Borough up to 2021. The Development Policies and Site Allocations documents, which contain policies and allocations which support the Core Strategy were submitted to the Planning Inspectorate on 30 November 2009.

- *Maldon District Replacement Local Plan*
  The Maldon District Replacement Local Plan (RLP) provides a comprehensive statement of land use policies and proposals for the Maldon District for the period April 2001 to October 2008. The RLP replaces the Maldon District Local Plan First Review adopted on 9 August 1996. In April 2009 the Council undertook consultation on its Core Strategy, which will form part of the new LDF.

- *Rochford District Replacement Local Plan*
  The Rochford District Replacement Local Plan was adopted by the Council on 16th June 2006. The Replacement Local Plan remained part of the statutory development plan until 15th June 2009, after which policies within the document expired unless saved by the Secretary of State. Rochford District Council applied to the Secretary of State for the extension of saved policies. The Council is at an advanced stage in the production of the Core Strategy and, following pre-submission consultation in late 2009, has submitted the document to the Secretary of State for independent examination.

- *Southend-on-Sea LDF*
  The Council has now commenced work on preparing a LDF for Southend, which will progressively replace the Southend-on-Sea Borough Local Plan (1994, with first and second alterations adopted in 1997 and 1999 respectively). The council has

undertaken consultation on site availability for employment and housing development.

- *Babergh District Local Plan*
  The plan was formally adopted by the Council on Thursday 1st June 2006 and became operative for development control purposes from that date. Babergh has requested to 'save' much of the plan beyond 1st June 2009 until such time as it is either superseded or replaced by new plans/polices. The Council has produced Annual Monitoring Reports and the Statement of Community Involvement was adopted on 19th December 2006. The Council is also exploring opportunities for joint working on LDF matters with its neighbouring Local Authorities.

- *Chelmsford Borough Council LDF*
  Chelmsford's Core Strategy was adopted by the Borough Council in February 2008. The core strategy forms a key element of the LDF and sets out the council's policies and proposals for the period up to 2021. Consultation on a range of additional elements of the LDF (including site allocations plan and statement of community involvement) closed in December 2009.

- *Ipswich Borough Council LDF*
  The Core Strategy document for Ipswich Borough Council is the first development plan document in the council's Local Development Framework to be submitted (26th March 2010). The LDF sets out the council's strategic vision for Ipswich up until 2025. Up until the adoption of the core strategy, the Ipswich Local Plan (2007) remains the current local plan for Ipswich Borough and includes a number of saved Local Plan policies in accordance with the Planning and Compulsory Purchase Act 2004.

- *Braintree District Council LDF*
  Braintree District Council's submission draft core strategy was approved by the council in February 2010. The process of making final changes to this document began in mid April. Until the adoption of the core strategy (expected to be June 2011), the Braintree District Local Plan, adopted in July 2005, remains in force. A number of the original policies within it expired three years after its adoption, although the majority have been 'saved' and will continue to apply until the core strategy is formally adopted.

Additionally, other projects such as measures to support the implementation of the Habitats Directive (e.g. the Review of Consents process) and the Water Framework Directive, do not contain any measures which provide for additional or in-combination effects. The Bathside Bay development is a significant major project in the plan area, but the effects of that proposal (including that compensatory habitat has been identified at Little Oakley, Hamford Water) have been identified in the Policy Appraisal process, and as such, the loss of intertidal habitat and effects of disturbance, etc have been considered. The SMP does not provide any additional effect in that area.

L5 ASSESSMENT RESULTS

L5.1 Introduction

The assessment provided is based on the manner in which the collective assessment units have any negative effect on the environment, as defined by the environmental issues on this coast. The primary analysis has been recorded on a series of detailed tables, which fully document the effect of each assessment unit in regard to the assessment criteria, with a full record of the primary assessment being provided in **Annex I**. An additional assessment is also provided in the following section, which details where the plan has been identified as having a negative effect on the environment. The intent of this is to establish: why this option was chosen; to evaluate other options if appropriate; and to suggest actions which will be required as mitigation.

A full table of the SMP policy is provided as **Annex V**.

The assessment has been provided in response to the policy offered for each Management Unit (MU) (as a collective assessment of their constituent PDZs). The assessment of the policies is based on the colour coded significance criteria as outlined in **Table 2.1** which is as follows:

SMP policy is likely to result in a major positive impact on the environment.	++
SMP policy is likely to have a positive or minor positive impact on the environment (dependant on scheme specifics at implementation).	+
SMP policy is likely to have a neutral or negligible effect on the environment.	0
SMP policy is likely to have a negative or minor negative impact on the environment (dependant on scheme specifics at implementation).	-
SMP policy is likely to have a major negative impact on the environment.	--
The relationship between the SMP policy and the environment is unknown or unquantifiable.	~
The assessment criterion is not applicable	

This section provides the overall assessment of the SMP2. For the detailed assessment at the assessment unit level refer to **Annex I**.

It is important to stress that the policy for each MU has been developed through the Policy Appraisal process, which is a fundamental step of SMP development. This Policy Appraisal process is summarised in Appendix E of the SMP as an overview, with a full, detailed appraisal in Appendix G of the SMP. Whilst for the reasons stated in Section 2 of this report a detailed appraisal for each PDZ over three epochs is not considered appropriate, the Policy Appraisal document should be considered a detailed and appropriately focussed consideration of the overall options for management in each MU. In addition, a commentary is provided below, as to the strategic options available, and why they were not pursued in preference to draft policy.

L5.2 Summary of Primary Appraisal of the SMP at the Management Unit level

In providing this assessment, the most problematic factor encountered was the nature of SMP policy coupled with the large degree of uncertainty regarding the manner in which the coast will respond to policy and sea level rise over the course of the plan. The assessment of policy on environmental receptors was provided within this context,

where quantification of effects is generally not appropriate but where effects could be established in terms of directions of management and management scenarios.

The overarching message which emerges from the assessment is that the SMP has addressed a range of issues where in ensuring positive benefits for certain environmental issues, a concomitant negative effect results in response to other issues.

The most obvious example of this is the need for the SMP to be compliant with the Habitats Regulations. This is a key consideration in the development of policy. Accordingly, the policy appraisal process had to consider effects on International sites as a core driver for policy evaluation. The SMP has sought to provide a balanced suite of policies which provide for measures to offset the significant amounts of coastal squeeze anticipated against defended frontages in response to sea level rise. As sea level continues to rise, intertidal habitat will be lost in front of sea walls or banks. In order for an adverse effect to be avoided under the Habitats Regulations, where designated intertidal habitat exists, measures must be provided to address such loss. The SMP has sought to offer managed realignment to create additional intertidal habitat. In providing such realignments however negative environmental effects have been identified where freshwater designated habitat, SSSI units, heritage assets, agricultural land and features to support coastal communities and access are lost. The positive message from the assessment, is that the sites for realignment have been selected to avoid environmental, heritage, social or economic features wherever possible, and the realignments have only had minor negative effects on a limited number of such features.

The loss of freshwater habitat (designated on International sites) has been recorded as a major negative effect. The reasons for the pursuit of this policy remain robust and will be outlined in the secondary analysis below.

In summary, the key drivers of the SMP have been to take a balanced approach to coastal management, using natural processes wherever possible. The intent has been to maintain the sustainable defence of established coastal and estuarine communities and ensure compliance with the Habitats Regulations. Within this, features which are important for communities and heritage assets have been maintained in a sustainable manner. This is reflected in the large number of positive assessments, with negative assessments being confined to areas where policy has been selected to address the drivers described above. No examples have been identified where negative effects occur without a driver to support other environmental features or values.

Within the assessment of the SMP, the majority (95) of PDZs within assessment units have recorded a minor positive score, with one major positive. Seventeen PDZs have scored minor negative with eight major negative. Given that the major negative impacts relate to impacts on international sites where compensation and mitigation will be provided, the SMP scores heavily towards a positive impact.

In regard to specific issues, relating to assessment criteria, six issues have emerged where the SMP is considered to have a negative effect. These issues are discussed in the secondary assessment below.

L5.3 Secondary analysis – a consideration of the likely effects of the SMP on the key environmental issues of the Essex and south Suffolk Coast

Of the issues that were identified in the Scoping Report and are listed in Section 3 of this report, the following issues remain which are not covered by other assessment mechanisms (such as the WFD assessment or the Habitats Regulations Assessment). These issues are discussed below in regard to the manner in which the management areas collectively have the potential to have an effect on each issue. This assessment is based on the detailed assessment provided in **Annex 1** and is summarised in **Table 5.1** below, which provides a clear and complete account of the effects of each management area on each issue (down to the level of detail of individual assessment criteria).

As outlined previously, where a policy is considered to have an adverse effect on the integrity of an international site, the impact is considered major negative within the SEA assessment. Compliance with the Habitats Regulations is a legal requirement of the SMP and the need to avoid adverse effects on International sites is one of the core drivers in the consideration of SMP policy.

Table 5.1 **Summary of Strategic Environmental Assessment**

Assessment Criteria	MU 1	MU2	MU3	MU4	MU5	MU6	MU7	MU8	MU9	MU10
ISSUE - Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types										
Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	-	-	-	-	-	-	--	-	-	0
Will SMP policy have an adverse effect on the integrity of any international sites?	--	--	--	--	--	--	--	--	--	--
Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?										
Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	0	+	0	+	+	+	0	+	0	-
Will SMP policy contribute to further SSSIs falling into unfavourable?	0	0	-	0	0	0	0	0	0	-
ISSUE - Maintenance of environmental conditions to support biodiversity and the quality of life										
The need to ensure that water quality is not adversely affected as a result of SMP policy.	-	+	-	+	+	+	0	0	-	0
ISSUE - Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries										
Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	+	+	-	+	+	+	0	+	-	-
Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	+	+	0	+	+	+	+	+	+	+
Does the policy work with or against natural processes.	+	+	0	+	+	+	0	+	-	-
ISSUE - Maintenance of water supply in the coastal zone										
Will SMP policy adversely affect abstraction infrastructure?	0	0	0	0	0	0	0	0	0	0
ISSUE - Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast										
Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	+	+	+	+	+	+	+	+	0	+
ISSUE - Potential loss of historic and archaeological features on a dynamic coastline										
Will SMP policy maintain key historic features and areas along the coastline?	+	+	+	+	+	+	++	+	+	+
Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	-	-	0	-	-	-	+	-	-	+

Assessment Criteria	MU 1	MU2	MU3	MU4	MU5	MU6	MU7	MU8	MU9	MU10
ISSUE - Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce										
Protection of coastal towns and settlements										
Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	+	+	+	+	+	+	0	+	+	+
Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	+	+	0	+	+	+	+	+	+	+
Protection of key coastal infrastructure										
Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	+	0	0	0	+	+	0	+	+	+
Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	+			0		+	0	+		+
Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	0	0	0	0	0	0	+	0	0	+
Will SMP policy protect, in situ, Bradwell Nuclear power station.						+				
The need to maintain a balance of providing navigation and access to estuary communities										
Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	0	+		+	+	+	0	+	+	0

L5.3.1 Issue 1 – The need to provide a balanced approach to the provision of terrestrial, freshwater and coastal habitat

This issue relates to the manner in which the SMP offsets the loss of intertidal habitat due to coastal squeeze, provides managed realignment to address this, and maintains levels of coastal habitat landward of defences (which may be lost due to managed realignment). The intent is to maintain a mosaic of intertidal habitat across the SMP area, and to maintain the levels of intertidal and coastal habitat. Delivering such a mosaic is challenging due to: the extensive areas of intertidal habitat expected to be lost as a result of coastal squeeze over the lifetime of the plan; the limited areas available for realignment to address this; and the potential loss of coastal habitat on managed realignment sites.

The assessment has indicated that eight units have scored minor negative (where levels of intertidal loss will exceed creation through managed realignment) and one unit (MU G – Dengie) has scored major negative. No managed realignment sites have been identified within this unit. MU J – Southend-on-Sea - has scored neutral, as losses within this MU are being offset by the Thames Estuary 2100 project.

Across the plan, over all epochs, levels of loss of intertidal will exceed levels of habitat creation through managed realignment. Expected levels of loss are not currently quantifiable, due to uncertainty about future increases in the rate of relative sea level rise and changes in coastal processes and geomorphology, but are expected to far exceed the amount of intertidal habitat created by the plan. The SMP has however endeavoured to deliver a mosaic of habitat, and this has been one of the key drivers for managed realignment. Additionally, the need to offer management attuned to the requirements of the Habitats Regulations, BAP habitat and SSSI designations has also been a consideration in policy development. This addresses this issue from a different perspective.

The provision of more realignment across the plan would not provide a more simple response to this, since it would likely lead to the loss of freshwater coastal habitat. Ongoing monitoring of the plan area is required, to provide greater understanding in regard to how coastal habitat and processes respond to sea level rise and coastal policy. This requirement is clearly expressed in the Action Plan of the SMP, and will enable subsequent SMPs to address the issue of providing more sites for realignment and/or addressing levels of loss (as they become known) through other mechanisms.

Action: The negative effects of the SMP are considered acceptable in the wider SMP context to provide a balanced approach to habitat provision. Monitoring of coastal processes has been specified in the SMP Action Plan to establish expected shifts in habitat composition over the lifetime of the plan. This work will inform future iterations of the SMP..

Alternative Options: The alternative option would be to take a no active intervention approach (leading to an uncontrolled loss of terrestrial areas) or a managed realignment approach (leading to a managed loss of terrestrial habitat). Given that the SMP provides for a balanced approach with regard to coastal processes across the plan, and in the absence of any identified drivers for these options, the preferred option appears the most appropriate.

L5.3.2 Issue 2 - The effect of policy on the integrity of any international sites

The assessment provided within this report was based directly on the findings of the Habitats Regulations Assessment for the consultation draft SMP (Appendix M). The assessment concluded that due to two factors: 1) the loss of freshwater habitat on managed realignment sites; and b) the loss of intertidal habitat in front of held defences, the SMP could not be concluded as not having an adverse effect on the integrity of international sites.

The process to address this issue will be established through the Habitats Regulations to ensure that compensation is provided for any such adverse effects. The specific details relating to the amount, location and the form of compensation will be determined through a statement of case for imperative reasons of overriding public interest (IROPI), to be developed in coming months. The impacts of the SMP in this context therefore are addressed through this process and are not detailed further within the SEA.

Alternative Options: Within the development of the SMP, no options were established which would avoid the adverse effects specified. The evaluation of policy in response to the requirements of the Habitats Regulations is responsive to the need to defend established communities and habitat, to provide realignment of defences to avoid coastal squeeze and to provide a strategic approach to management. The manner in which this relates to management options plan wide is complex and extensive. The options available are detailed in the SMP and the evaluation of options (within a context of establishing the impacts of policy) is addressed within the Habitats Regulations Assessment.

L5.3.3 Issue 3 - The effect of policy on the condition of SSSIs

The assessment provided here established that the effects of the SMP will be largely neutral (eight MUs) however two MUs (C Tending Peninsular and J Southend-on-Sea) were identified as having a minor negative effect. The negative effect in MU C relates to the loss of brackish habitat on the Holland Marshes site, due to the MR policy which will lead to its replacement with intertidal habitat. This has been scored as minor negative, since it relates to the loss of a designated habitat type on this site. Natural England will need to establish the most appropriate manner to respond to this loss. Two options would appear relevant, either to accept this transition as a natural process, which does not impact the condition of the site, or to provide replacement habitat elsewhere. This matter is addressed in the mitigation and monitoring section of this report. The negative impact at Southend (MU J) relates to the loss of intertidal habitat in the Benfleet and Southend Marshes and the Foulness SSSI. Again this issue will require consideration by Natural England as to how to attend to this loss.

Alternative Options: In the case of the realignment at Holland Marshes, the existing defences were not considered sustainable in the development of the SMP and the appraisal of available options. Accordingly, realignment is the preferred option with an NAI option leading to uncontrolled loss of habitat. The policy of HTL at Southend is essential to maintain coastal communities, and realignment to avoid squeeze was not considered a viable option for further consideration.

L5.3.4 Issue 4 – The need to ensure that there be no net loss of UKBAP habitat within the SMP timeline up to 2100

This issue relates to the need for the SMP to provide for the management of BAP habitat across the plan. Given the transitional nature of coastal habitat, the management intent therefore needs to ensure that there will be no overall net loss of BAP habitat. Given the uncertainties relating to the response of the coast to sea level rise and policy in later epochs, this matter cannot be addressed in regards to simple quantification of overall extent. The SMP therefore has been assessed on the basis of whether loss of intertidal areas through squeeze is addressed through managed realignment, and whether this arrangement in itself is provided over existing terrestrial BAP habitat. Loss of terrestrial habitat in this context is considered acceptable as it will be replaced by intertidal BAP habitat, leading to no overall net loss.

The SMP provides for four neutral MUs, where the levels of loss are expected to be in balance with gain through managed realignment. Equally five minor positive scores were provided for MUs B, D, E, F and H, due to large areas of intertidal being provided over non-BAP agricultural land. One assessment unit scored minor negative however – MU J Southend-on-Sea. In this MU the intent of management to hold the line in front of existing communities (Southend) will lead to a net loss of intertidal habitat in those frontages through coastal squeeze. Overall, the effect on BAP habitat is considered to be neutral, with some localised levels of loss and gain being provided across assessment units, but with a predicted no net loss of BAP habitat across the SMP. On balance therefore, even though MU J has provided a minor negative score at an assessment unit level, the overall effect of the plan is neutral. This situation should however be monitored so that the actual levels of loss and gain are established, and BAP habitat requirements can be identified as the effects of the plan and sea level rise become evident.

Action – The SMP monitoring programme to have explicit recognition and actions for the monitoring of BAP habitat across the plan.

L5.3.5 Issue 5 – The need to ensure that water quality is not adversely affected as a result of SMP policy

The assessment established that overall the SMP will have a neutral effect. Four of the ten MUs score minor positive impacts against this criterion. Three units, G Dengie, H Crouch and Roach Estuaries and J Southend-on-Sea, are considered likely to have a neutral effect. However three units, A Stour and Orwell Estuaries, C Tendring Peninsula, I Foulness, Potton and Rushley Islands will possibly have a minor negative effect through contributing to the failure of the water body to meet one or more of its objectives.

The negative effect in A Stour and Orwell Estuaries relates to Managed realignment affecting the Orwell Tidal Fresh Water Body, through potential saline intrusion (although this may already be occurring), and a number of possible impacts resulting in the Stour potentially failing a number of objectives. In Management Unit C Tendring Peninsula policies within the Holland Haven may prevent other water bodies meeting their objectives. Impacts could include saline intrusion resulting from a MR policy (again, such intrusion may already be occurring). In both these units, some ongoing investigation into the scale and nature of the impacts is suggested. In MU I Foulness, Potton and Rushley Islands, HtL policy has the potential to result in the loss of more land through coastal

squeeze than is offset by MR policies elsewhere within the water body. This latter issue will require consideration by Natural England as to how to attend to this loss.

Alternative Options: In the case of the realignment at Holland Marshes, the existing defences were not considered sustainable in the development of the SMP and the appraisal of options. Accordingly, realignment is the preferred option with an NAI option leading to uncontrolled changes. In the other two units, the adoption of alternatives (eg HtL) would not necessarily avoid a different negative impact.

L5.3.6 Issue 6 – The provision of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management

At the heart of this issue is the intent to move towards more holistic, sustainable coastal management by working with coastal processes and providing for the maintenance of coastal communities whilst allowing natural coastal development in undeveloped areas. That is to only provide defence where there is a clear driver to hold the line. Typically, this need is the location of communities or key resources that cannot feasibly be relocated. In this context, a uniform approach of walking away from the coast (through a policy of no active intervention), of not defending communities or other receptors, would not provide 'balance'. Neither would a HtL policy across the entire SMP, since part of the 'balance' is allowing areas of coast to erode or accrete and to work with coastal processes wherever possible and appropriate. In this assessment however, where a given assessment unit is dominated by HtL policy, a minor negative score has been provided, since on those particular frontages, even if a clear driver to hold the line exists at the assessment unit level, the assessment unit frontage itself may not demonstrate 'balance'.

Six of the ten MUs provide a minor positive score in regard to this issue, one scored neutral and three scored minor negative. Overall, the SMP clearly provides a balanced approach – one of only defending areas where key features are present; where they are absent or where other factors for alternative policies exist, MR or NAI policies are provided. This balance has been provided by the Policy Appraisal process, which has evaluated the drivers and constraints along this section of coastline.

The MUs identified as having a minor negative effect (C, I and J), contain PDZs where there is a clearly established need to hold the line. In MU C, it is the coastal settlements of the Tendring peninsula, in MU I it is the MoD land at Foulness (the management of which is under review through a MoD process) and the Southend frontage in MU J. In each case, the HtL policy, although not working with coastal processes, is required to maintain coastal communities and the historic and economic features they contain. Any alternative approach, would lead to the significant loss of established communities and the features they contain. In the context of the SMP as a whole, this is not considered to provide 'balance' and is therefore not a feasible alternative. The SMP as it stands provides this balance and there are no outstanding effects in regard to this issue, which require mitigation.

Alternative Options: It is considered that at the SMP level on this coastline, no alternative options exist to offset a minor negative effect within some frontages. In order to provide for balance across the plan as a whole, some frontages (typically urban frontages) will not be able to demonstrate a 'balance' within that assessment unit. The patterns of development across the coast in this area are not uniform, some areas have more development than others, and accordingly, blanket positive scores are not possible

for this issue. Overall, as a plan however, it is considered that the SMP would score minor positive, since this balance has been provided, and the character of the coast is provided for in the long term.

L5.3.7 ISSUE 7 – The intent to provide for sustainable coastal management by working with natural processes

This relates to working with coastal processes as a principle of sustainable coastal management. In regard to this issue, only two MUs (I and J) scored minor negative. Although containing a significant HtL frontage, the MU for Tendring Peninsula (C) did not score negatively since the effects of the HtL policy, coupled with the element of MR, are not considered to actively work against wider coastal processes (given their location on a linear coast). MUs I and J, the Foulness and Southend frontages, do however provide HtL policy which at the MU level is considered to significantly affect coastal processes.

The choice of policy on these units is essential to provide balance across the SMP by maintaining coastal communities and associated features (including heritage assets and features required for quality of life etc). The MoD land has been provided with a policy of HtL at the extent of its frontage (the areas which are not accreting) while a foreshore management approach is being developed by the MoD itself. This is to some extent a holding policy while the MoD process informs SMP3.

Since this issue relates to the sustainable management of the foreshore, the intent is that across the plan as a whole, wherever appropriate, the policy should be to work with coastal processes. In response to other drivers, on certain frontages (as illustrated above), this may not be appropriate. In these instances, there is no singular measure which will offset any environmental effect, unless impacts on coastal processes are identified which require mitigation. In the examples at MU I and MU J however, no effects have been identified on coastal processes which require such measures.

Alternative Options: As described above, the coast of Essex is not a uniform mixture of development and open coast. Therefore some policies may appear, at the MU level, not to work with coastal processes. This needs to be considered in the context of this particular coast where natural processes within the estuaries and along the coast have an element of human foreshore management (defence of community frontages etc). The alternative to the approach of the SMP, to hold key frontages would be to allow the entire frontage to develop in response to coastal processes. This would lead to the loss of coastal communities, heritage assets, habitat, coastal access etc, and could not be said to provide a balanced approach to management within the SMP. The SMP works with natural processes (where appropriate) as a principle, and the balance obtained in this respect is considered to minimise negative environmental effects. The alternative option would appear therefore to be one of not defending key areas of coast and this is not considered appropriate due to the wide ranging negative environmental effects that would occur.

L5.3.8 ISSUE 8 – The sustainable protection of the historic environment

The protection of the heritage assets is a central consideration in the SMP process. This relates to the protection of known heritage assets and unknown archaeological features.

The issue identified where the SMP may have a negative effect here relates to unknown archaeological features. In the Policy Appraisal exercise for the SMP, the avoidance of these heritage features was a central consideration in the assessment of sites for managed realignment. Indeed the SMP scores uniformly positive across all MUs for the protection of historic features.

The loss of the terrestrial area in all managed realignments within the SMP has the potential to lead to the loss of undiscovered archaeological assets. This is considered, on balance to be acceptable, given the drivers for realignment (habitat creation, coastal process management, balanced approaches to foreshore management etc) but still requires an active process to enable English Heritage to investigate such sites. The SMP has provided time for investigation through selecting epoch 2 and 3 for the realignments where possible. Nevertheless, all MUs which have a managed realignment policy need to be specified for English Heritage, so that site investigations can be planned and resources for investigation secured. All MUs with the exception of C, G and J have therefore been identified as having a potential negative effect on archaeology.

Action – The following areas (**Table 5.2**) may lead to the loss of archaeological features and will require investigation by English Heritage. In the course of such investigations, should a site be found which requires further investigation, or protection, these matters should form a core consideration of policy evaluation in subsequent SMPs. Managed realignment sites within the SMP are detailed below:

Table 5.2 Managed Realignment Areas

PDZ	Epoch
A8a	1
B4a	1
F14	1
H10	1
A3a	2
A2	2
A8b	2
B2 (without Bathside)	2
B2a	2
D1b	2
D2	2
D3	2
D5	2
D6	2
D8a	2
E2	2
E4a	2
H11a	2
H2a	2
H2b	3
B3a	3
B5	3
C2	3
C4	3
F12	3
F3	3
F5	3
H11b	3
H2b	3
I1c	3

Alternative Options: An alternative approach to management which would protect all coastal archaeology would be to defend the entire frontage and the archaeology behind defences in situ. In this approach both historical assets and archaeology would be maintained, but this would be at the expense of a wide range of other environmental factors. The principle that management of this coast is dependent on a balance of natural coastal development and fixed points within estuaries or at community frontages would be jeopardised. Equally a blanket HtL policy for all epochs is not considered either sustainable or feasible. The policy suite as it stands, in addition to the provision of mitigation in relation to historic assets, remains the preferred option.

L5.4 Overall Impacts of the Essex and South Suffolk SMP

It is the nature of the Essex and south Suffolk coast that, in order to maintain its environmental values, a balance is required (as described above) of holding on to fixed points adjacent to coastal and estuarine settlements and allowing natural processes in the areas in between. In a wider context this balance is dependent on sediment movement along the coast, within estuaries and the evolution of the coast in response to this.

The Policy Appraisal exercise within the SMP sought to provide policy which will maintain the environmental values of the coast, whilst seeking to offer a balance of dynamism for coastal evolution and security for coastal communities. In providing this balance, the SMP has typically scored minor positive in most of its effects on the environment (within the issues defined by this assessment). Where negative effects have been highlighted, no SMP options have been identified which would provide preferential approaches to management (which would reduce the environmental impacts).

The negative effects identified largely relate to the loss of some environmental features in the pursuit of managed realignment, which in itself provides for environmental benefits (habitat creation, more natural coastal development). Given the predictions for sea level rise there are clear drivers for managed realignment on this coast and, through the Policy Appraisal process, of all the potential sites only those where there will be negligible or limited negative environmental effects have been selected for realignment. Additionally, wherever possible, realignments have been phased to mid or later epochs to provide time for adaptation.

It is considered that this selection process has provided a range of managed realignment areas which have relatively limited effects, since sites which contain key environmental or community assets were 'filtered out' at an early stage. The alternative to providing realignments would lead to the provision of unsustainable foreshore management, which would not allow for the natural development of the coast or provide any balance in terms of coastal processes along the coast.

An additional effect, linked to that of managed realignment provision, is coastal squeeze of habitat located seaward of defences. This in itself is a driver for managed realignment so that, in the course of the plan, a balance of habitats types and coastal form will be maintained. The realignments themselves provide opportunities for habitat creation to offset areas lost through squeeze on HtL frontages. Although the plan has scored negatively in regard to the need to provide a mosaic of habitat type, this is associated with the extensive area of intertidal habitat which is expected to be required to address anticipated levels of coastal squeeze. The SMP has provided a range of managed realignment sites across the plan. However the number of available sites does not provide adequate levels of habitat creation to offset anticipated loss.

The assessment has indicated major negative effects where the plan will have an adverse effect on the integrity of international sites. The assessment of the effects on international sites is provided in detail in the Habitats Regulations Assessment for the SMP. In summary, the adverse effect is considered unavoidable in providing an overarching approach to the defence of settlements and agricultural land and addressing the loss of designated intertidal habitat through coastal squeeze. The actual adverse effect, loss of intertidal, freshwater and terrestrial habitat, will be offset through compensation. Compensatory measures for the SMP, under the Habitats Regulations, will be according to a programme agreed between Natural England and the Environment Agency.

Overall, the environmental effects of the plan are mainly positive, and where negative effects have been identified, this has been in the pursuit of other environmental factors, and additional actions have been provided to address this.

L5.5 Cumulative Effects

No examples were identified where the SMP would have a number of negative effects that would result in cumulative effects. The negative effects of the SMP are discrete and do not combine to offer a new or magnified impact.

L6 MITIGATION AND MONITORING

Of the minor adverse effects identified in this assessment, some are addressed within the wider context of synergies and balance in relation to the effects of other management areas, whilst some require specific mitigation (for example compensatory habitat where an adverse effect under the Habitats Regulations has been identified). Equally, some management areas work against natural processes, in order to hold key areas of coast to protect other environmental values. It is the manner in which policy is applied across the SMP in order to provide balance, that is the important factor in such examples, and mitigation is not appropriate or required. This is the critical factor in providing mitigation for the SMP.

The SMP does however require mitigation where an adverse effect has been identified. It is considered that in this context, the following measures are required to support the SMP in avoiding an adverse effect on the environmental values of the Essex and south Suffolk coast.

Due to the uncertainties in how impacts of SMP policy will manifest themselves, monitoring is a key element to scope any necessary mitigation. Actual levels of loss are typically unknown or based on estimations. The actual effect will be the composite of SMP policy and wider coastal processes. For this reason, monitoring of the response of the system is considered critical to establishing appropriate mitigation measures. The measures below therefore specify monitoring requirements. These, and required mitigation, will be provided within the SMP Action Plan.

Due to the nature of SMPs, where review is provided well within the overall timeline (three epochs) of the plan, monitoring of each SMP will need to inform the development of subsequent plans. Accordingly, as negative impacts become better understood, consideration of such effects (potentially through amendments to policy) will inform the development of later SMPs as well as the strategies and schemes which implement the preferred policies. It is anticipated however, that the negative impacts identified in this plan are not likely to be offset by policy amendment, but will require additional measures (for example, habitat creation).

L6.1 Habitat monitoring and management

Loss of BAP Habitat

A key element of the effects of SMP policy will be shifts in transitional habitat composition. There is a need therefore to ensure that existing monitoring of BAP habitat in the plan area is provided in a manner which will highlight shifts in BAP habitat extent, and inform the BAP recording process. This mechanism is required to ensure that wider mechanisms for BAP habitat creation address the emerging requirements based on the effects of the SMP. The monitoring of BAP habitat therefore needs to have specific actions in regard to the effects of SMP policy.

Impacts on SSSIs

The SMP has the potential to affect the condition of SSSIs and (due to the number of SSSIs on the coast) the high level targets relating to the percentage of SSSIs in favourable condition. It is therefore essential that monitoring of SSSI units enables an early determination of where favourable condition may be threatened by inappropriate coastal management (SMP policy). It is considered that existing monitoring by Natural England would be sufficient for this purpose, but there is a need to feed any initial findings into the SMP Action Plan and the development of subsequent SMP policy at the earliest stage.

For the two management units where a negative impact has been identified (Southend and the Tendring Peninsula) monitoring should be focussed on establishing the loss of brackish habitat (in the case of the former) and intertidal habitat in the latter. Once the actual levels of loss are established, agreement will be required with Natural England to establish the scope and nature of mitigation required.

Investigation of coastal cultural and archaeological sites
Where the implementation of SMP policy would lead to the loss of sites/features which are important to the historic environment two options are available:

1) Relocation of features to a more secure location; and
2) Provision of a site investigation to investigate and record the content and value of sites.

In the case of the Essex and South Suffolk SMP2, the identified potential negative effects related to the loss of potential archaeological features on managed realignment sites. It is essential therefore that resourcing and time is provided for English Heritage to commence site investigations where considered necessary in managed realignment areas. Within the SMP Action Plan therefore, English Heritage will be instrumental in establishing what the specific nature of losses may be, and where losses are known, a figure for investigation established so that this funding can be sought from Government. The intent of addressing this matter within the Action Plan will be to ensure that English Heritage are provided with funds, in advance, to investigate threatened sites.

L7 THE NEXT STEPS IN THE SEA PROCESS

This report is provided for consultation simultaneously with the SMP itself. Comments should be provided to:

Ian Bliss
Essex and South Suffolk SMP consultation
Environment Agency
Cobham Road
Ipswich
IP3 9JD

L7.1 The Purpose of Consultation

The purpose of consultation for this report is to establish:

- Have the environmental issues been correctly identified?
- Does the report correctly identify negative impacts on the environment?
- Is the information provided correct?
- If issues or detail have been omitted which should be a key element of the assessment?

Answers to these questions, or other issues relating to the environmental effects of the plan would be welcome as a component of consultation. All comments on this SEA Environmental Report should be received by 4pm on 18th June 2010.

L7.2 Subsequent Documents

Following the completion of this report, a Post Adoption Statement and statement of particulars will be provided to detail how the environmental considerations of this process have been integrated into the SMP and how the consultation and response to consultation has been considered within the SEA process.

L8 REFERENCES

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ANNEX I

Environmental Assessment

The assessments in the following pages are also colour-coded, as described in **Table 2.1** (above) which is duplicated here for convenience

Significance of SMP Policy	
++	SMP policy is likely to result in a major positive impact on the environment.
+	SMP policy is likely to have a positive or minor positive impact on the environment (dependant on scheme specifics at implementation).
0	SMP policy is likely to have a neutral or negligible effect on the environment.
-	SMP policy is likely to have a negative or minor negative impact on the environment (dependant on scheme specifics at implementation).
--	SMP policy is likely to have a major negative impact on the environment.
~	The relationship between the SMP policy and the environment is unknown or unquantifiable.
	The assessment criterion is not applicable

Table 1 Management Unit A Stour and Orwell Estuaries

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	Three managed realignment (MR) policies are provided which actively seek to address the loss of intertidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Nine policy development zones (PDZ) in this assessment unit have been established as having an adverse effect on the integrity of international sites (Stour and Orwell Estuaries Special Protection Area (SPA) and Stour and Orwell Wetland of International Importance especially as Waterfowl Habitat (Ramsar)) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The MR policies in this management unit (MU) provide the system with the opportunity to respond to sea level rise (SLR). In this MU, the loss of mudflat would therefore be offset by MR and the effect is therefore neutral. Port development in PDZA1 and PDZA11a requires some advance the line (ATL) policy for expansion purposes. This would lead to the loss of intertidal habitat, but the compensation for this has already been agreed through a separate assessment process. The effect is therefore neutral.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	Two Sites of Special Scientific Interest (SSSI) are affected within this MU: Stour Estuary SSSI and the Orwell Estuary SSSI. The key features of the Stour SSSI are intertidal habitats to support wintering wildfowl and marine fauna. This site also is designated for various geological reasons and SMP policy does not prevent the continued exposure of these areas. The key features of the Orwell are eelgrass (*Zostera marina*) and intertidal habitats which support nationally important breeding and non-breeding birds. As a result of the agreement between the Environment Agency (EA) and Natural England (NE) regarding habitat creation to ensure that the overall coherence of the Natura 2000 network on an individual site basis is maintained, this assessment assumes that all Public Service Agreement (PSA) targets are met

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
				throughout the lifetime of the SMP. Compensation has also been agreed for the Bathside Bay development, which will ensure favourable condition to be maintained. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan. The overall effect is therefore neutral.
Maintenance of environmental conditions to support biodiversity and the quality of life				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	*Orwell* MR2 policies for PDZA2 and PDZA8a have the potential to compromise Environmental Objectives being met in other water bodies. In this case the Orwell Tidal Fresh Water Body (GB105035040390). Realignment of the defences may result in saline inundation of this freshwater body thereby affecting freshwater Biological Quality Objectives (BQE) that may be present. However, as this water body runs immediately behind the defences at A2 (Trimley Marshes) and at PDZ 8a it may already experience saline inundation and freshwater BQE may already be compromised. Further investigation with the Environment Agency is recommended. *Stour* SMP2 policies which have the potential to cause this water body to fail one or more objectives include HTL policies for A9adf, A10ace, A11b; ATL policies for A11a; and MR1 policies for A8c, A9ce and A10df. A combination of high ground and geological constraints mean that MR2 opportunities are limited to Shotley Marshes in A8b. This also means that BQE affected through HTL policy may also contribute to the failure of the water body to meet its environmental objectives as habitat lost through coastal squeeze will not be replaced through MR2 habitat creation policies. ATL at Harwich Harbour (A11a) may also result in the loss of intertidal and subtidal BQE. Overall the effect is minor negative.
Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population	SMP policy in this MU intends to support the natural development of the estuary. However, some local intervention is specified for areas where management will provide for the protection of communities at risk from erosion or to support port development. The intent however is minimal impact on coastal processes. This will be balanced by SMP policy in a range of PDZ, which seek

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
			Communities	to move the estuary towards a more natural system. Overall the effect is considered minor positive.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		SMP policy in this MU provides enhanced protection for erosion risk areas and moves towards more sustainable approaches to management (in managed realignment areas). The effect is minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides a range of policies, the intent of which is to move towards a more natural estuarine system. This is achieved through a combination of MR policy whilst protecting existing communities from erosion and flood risk, therefore ensuring strategic approach to the management of the estuary with a minor positive effect.
Maintenance of water supply in the coastal zone				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water	There is one groundwater abstraction with a Source Protection Zone (SPZ) in the Felixstowe GWB. However, given that the location of the abstraction is a significant distance from the coast it is considered unlikely that this abstraction would be impacted by policies within the SMP. The effect is considered neutral.
		Change of salinity in the freshwater aquifer attributable to SMP policy.		
Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	This MU falls within the Suffolk Coast AONB. The MU provides for a balance of HTL to protect key assets and MR to provide or maintain levels of intertidal habitat (important to the coastal landscape). Two heritage features may be lost however – a listed building in PDZA7a (due to NAI which may be lost in epoch 3) and a listed building in PDZA7b (which may be protected by local intervention under this policy). In the wider landscape however, the MU provides for a balance of key natural, cultural and social features and the effect is minor positive.
Potential loss of historic and archaeological features on a dynamic coastline				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	As above, this MU will maintain a wide range of historic features (within or outside communities). Two heritage features may be lost however in A7a and A7b (as described above). The loss of either listed building is however not certain: in A7a it lies outside of the expected erosion line for E3; and in A7b it may be protected by intervention under the terms of the policy. On balance, with these two possible exceptions all historic features would be protected in this MU and the effect is minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with English Heritage (EH), all NAI or MR PDZs were described as having moderate or high potential effects on archaeological sites. This accounts for approximately half of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on undiscovered archaeology. In discussions with EH, it was agreed that mitigation would involve time being allowed for investigation prior to any MR scheme taking place. Overall the effect is therefore minor negative.
Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce				
Protection of coastal towns and settlements				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for sustainable flood and erosion risk management policies for all coastal communities throughout the lifetime of the SMP. As such, minor positive.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside of key coastal settlements, or maintenance of the function or utility of such features.	Populations Communities	The MU provides for the maintenance of key features to support settlements – including ports, marinas, foreshore parks and the Harwich rail line. MR and NAI areas have been actively selected to avoid the loss of such features. The Stour and Orwell footpath (which enhances the quality of life for local residents) will be interrupted by various MR policies, but it is considered that the route could be realigned and its function would not be lost. Overall the effect is minor positive.
Protection of key coastal infrastructure				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU will not lead to the interruption of any road transport systems. A minor road may be affected in PDZ A6 – Wherstead Road (due to increased flooding), However the policy provides for protection measures for this road. The effect is considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	The MU will protect the Harwich rail line. Depending on erosion levels some maintenance work may be required in E3; however policy is provided to support defence of the rail line if required. The effect is considered minor positive.
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policies have the potential to interrupt linear access along the coast (especially the Stour and Orwell Walk, an important tourist feature); however, it is not anticipated that this would lead to the loss of access along the coast. The route would simply be diverted to accommodate the MR and policy reflects this intent. The effect is considered to be neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
The need to maintain a balance of providing navigation and access to estuary communities				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The actual effect of policy is unknown, since the effects of MR and HTL policy are dependent on any schemes and associated measures. The potential effects of SMP policy may lead to siltation or erosion of channels with loss of navigational function, although it is anticipated that the implementation of SMP policy within this MU contains nothing which cannot be mitigated at the scheme level. This effect is therefore considered to be neutral.

Table 2 Management Unit B Hamford Water

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	Four MR policies are provided which actively seek to address the loss of intertidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Four PDZs in this assessment unit have been established as having an adverse effect on the integrity of international sites (Hamford Water SPA and Ramsar) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Coastal squeeze has the potential to lead to the loss of United Kingdom Biodiversity Action Plan (UKBAP) (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	MR policies in this MU provide the system with the opportunity to respond to SLR by providing intertidal UKBAP habitat over existing farmland. As the agreement between the Environment Agency and Natural England will offset habitat losses throughout the lifetime of the plan in response to SLR, additional sub-littoral habitat will be gained as SLR occurs. The effect is therefore minor positive.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSI in this area is Hamford Water which is designated for a range of birds, notably breeding terns and Brent geese. The MR PDZs will lead to the loss of some freshwater habitat but will provide intertidal habitat and the effect is considered to be neutral, since the issue provides loss of one habitat type and the gain of another. Mitigatory/compensatory habitat created to ensure no adverse effect on the Natura 2000 network will also ensure that habitat is created. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan.
Maintenance of environmental conditions to support biodiversity and the quality of life				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	MR2 is proposed in B2, B3a, B4a, and B5. The creation of new intertidal habitat supporting angiosperm, invertebrate and fish BQE means that deterioration in the overall

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
	prevent WFD environmental objectives to be met?			ecological potential of the water body is considered unlikely. WFD Environmental Objectives are likely to be supported by the proposed SMP2 policies, i.e. a minor positive.
Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of Hamford Water. Overall the PDZs reduce the reliance on management (through MR) and allow for the natural development of this system. Overall the effect is considered minor positive.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The MU provides for protection of all coastal communities such as Walton on the Naze etc. The effect is considered minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides a range of policy, the intent of which is to move towards a more natural development of Hamford Water as an embayed system. This is achieved through a combination of MR policy whilst protecting existing communities from flood risk, and allowing the coast to erode according to natural processes (adjacent to the Naze). The effect is considered minor positive.
Maintenance of water supply in the coastal zone				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water	There are no issues identified with groundwater in regard to MR SMP2 policies for this MU. The groundwater within this MU is defined as unproductive. It is considered that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall the effect is considered neutral.
		Change of salinity in the freshwater aquifer attributable to SMP policy.		
Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for a balance of HTL to protect key assets and MR to enable the natural development of Hamford Water (important to the coastal landscape). No historic features would be lost within the MU and indeed such features are protected by the HTL policy. In the wider landscape, the MU provides for a balance of key natural, cultural and social features with a minor positive effect.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Potential loss of historic and archaeological features on a dynamic coastline				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	As above, this MU will maintain a wide range of historic features (within or outside communities) with no losses expected. The effect is considered minor positive.
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP.	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, all NAI or MR PDZs were described as having moderate or high potential effects on archaeological sites. This accounts for approximately half of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on undiscovered archaeology. A key factor however is that in discussions with EH, it was stated that mitigation would be provided to allow time for site investigations and MR. PDZs have been specified across the timeline of the plan to accommodate this and time for site investigation is a requirement of MR policy and MRs are not clustered into one epoch). Overall the effect is minor negative.
Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce				
Protection of coastal towns and settlements				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for protection of all flood risk communities and the scope for intervention to protect erosion risk communities. The MU has been devised to offer a sustainable long term approach to protecting communities in this area and the effect is minor positive.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside of key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	The MU provides for the maintenance of key features to support settlements – Dovercourt Port, Walton Channel, footpaths (around Little Oakley) and Trimley Marsh Marina. Overall the effect is minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Protection of key coastal infrastructure				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU will not lead to the interruption of any road transport systems and roads in this MU are located away from the foreshore. The effect therefore is neutral.
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	Not applicable
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policies have the potential to interrupt linear access along the coast (especially the Stour and Orwell Walk), however it is not anticipated that this would lead to the loss of access along the coast. The route would simply be diverted to accommodate the MR and policy reflects this intent. The effect is considered neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
The need to maintain a balance of providing navigation and access to estuary communities				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to comities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The actual effect of policy is unknown, since the effects of MR and HTL policy are dependent on the scheme and its measures. The MR policy adjacent to Walton Channel (B5) will maintain flows and the navigability of the channel which serves Trimley Marshes Marina. The overall effect therefore is minor positive.

Table 3 **Management Unit C Tendring Peninsula**

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	The majority of this frontage is developed urban areas adjacent to Clacton and Jaywick. However two MR policies are provided which actively seek to address the loss of inter tidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	One PDZ in this assessment unit has been established as having an adverse effect on the integrity of international sites (Colne Estuary SPA and Ramsar) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable.
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The loss of brackish areas in this area to intertidal habitat will provide similar amounts of BAP habitat through transition and the effect is therefore neutral.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	This MU contains three SSSIs with a foreshore frontage: Holland Haven Marshes, Clacton Cliffs and Foreshore and Colne Estuary. The key features for Holland Haven Marshes are aquatic and terrestrial invertebrates in brackish marsh, the Clacton Cliffs are a geological site of Pleistocene deposits and River Colne is for estuary feature. The MR over the Holland Marshes would have a minor negative effect, due to the loss through erosion of brackish habitat, which would be replaced with intertidal habitat. The policy adjacent to the cliffs at Clacton will not prevent the erosion of the cliffs and the effect is therefore neutral. The PDZ within the Colne enables natural development of the estuary and the effect is neutral. Overall, due to the loss of habitat at Holland Marshes the effect is minor negative. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Maintenance of environmental conditions to support biodiversity and the quality of life				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	SMP2 policies within Holland Haven have the potential to prevent or compromise WFD Environmental Objectives being met in other water bodies. MR2 at Holland Haven will mean that the Holland and Hamford FWB (GB105037033970) and Holland Brook FWB (GB105037077810) may be affected by saline inundation. However as these water bodies run immediately behind the defences at Holland-on-sea they may already experience saline inundation and freshwater BQE may already be compromised. Further investigation with the Environment Agency is recommended. Overall the effect is minor negative.
Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to provide long term stability of this frontage to protect coastal communities in Tendring and their respective foreshore areas. To some degree this is a continuation of previous policy, but an element of MR is also provided at Holland Gap (C2) and (through the coastal masterplan being developed by Tending DC & Essex CC) adjacent to Jaywick (C4). Overall the effect of policy is minor negative since the MU provides for protection of communities as opposed to natural coastal development.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The MU provides continued protection for coastal communities, however the option is provided for MR adjacent to Jaywick (based on the outcome of the Jaywick Masterplan). The masterplan will feed SMP policy, however SMP policy currently provides for MR in E3. The approach to management adjacent to Jaywick seeks to provide long term sustainable management of this area and the effect is therefore neutral since actual flood risk will not increase under this policy.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU seeks to protect coastal communities in situ, and does not work with natural processes. The intent is to provide some stability and some dynamism in regards to coastal behaviour. Overall, the effect is considered neutral.
Maintenance of water supply in the coastal zone				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
		Change of salinity in the freshwater aquifer attributable to SMP policy.		

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for a balance of HTL to protect coastal communities and MR to provide to maintain levels of intertidal habitat (important to the coastal landscape). The coastal communities which dominate this MU are a core element within the coastal landscape and their protection is therefore a significant measure to maintain coastal landscape values. In the wider landscape however, the MU provides for a balance of key natural, cultural and social features and the effect is considered minor positive.
Potential loss of historic and archaeological features on a dynamic coastline				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	As above, this MU will maintain a wide range of historic features (within or outside communities). The MR in C2 or C4 will not lead to the loss of historic features, historic setting or undiscovered archaeology. All historic features would therefore be protected in this MU and the effect is minor positive.
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, the MR in C2 was described as having moderate or potential effects on archaeological sites. Since the MR at Jaywick is in E3, ample time is provided for the investigation of this site which is considered a sustainable approach. A key factor however is that in discussions with EH, it was stated that mitigation would be provided to allow time for site investigations and MR PDZs have been specified across the timeline of the plan to accommodate time for site investigation, which is a requirement of MR policy and MRs are not clustered into one epoch) Overall the effect is neutral.
Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce				
Protection of coastal towns and settlements				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for protection of all coastal communities (with the exception of Jaywick where local sustainable protection is sought through the Local Development Framework – with the SMP suggesting MR in E3). The MU has been devised to offer a sustainable long term approach to protecting communities in this area. The overall effect is therefore minor positive.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance	Populations Communities	The MU provides for the maintenance of key features to support settlements – including roads and the foreshore areas (beaches etc). MR in C2 will lead to the loss of the golf course, but this is not considered an 'essential' feature. Overall the effect is neutral.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
		of the function or utility of such features.		
Protection of key coastal infrastructure				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU will not lead to the interruption of any road transport systems and the effect is neutral.
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	Not applicable – the rail line into Clacton is located inland.
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policy in C2 and C4 will interrupt linear access along the coast. However, it is not anticipated that this would lead to the loss of access along the coast, the route would be diverted to accommodate the MR and policy reflects this intent. The effect is considered neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
The need to maintain a balance of providing navigation and access to estuary communities				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	Not applicable

Table 4 **Management Unit D Colne Estuary**

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	Six MR policies are provided which actively seek to address the loss of inter tidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Six PDZs in this assessment unit have been established as having an adverse effect on the integrity of international sites (Colne Estuary SPA and Ramsar) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to the loss of terrestrial habitat and agricultural land, to offset loss of intertidal areas through coastal squeeze. Since the MR to provide BAP habitat will in part be over non-BAP habitat the effect is considered minor positive.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSI in this MU is the Colne Estuary with its intertidal features. The intent of the MU is to balance loss of intertidal through SLR by MR and the effect is therefore considered neutral in this MU. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan.
Maintenance of environmental conditions to support biodiversity and the quality of life				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	This MU has an extensive MR program of SMP2 policies. Overall, the MR planned within this water body should ensure that the ecological functioning of the system is maintained despite localised losses where HTL is the preferred policy. Therefore preferred policies within this SMP2 are considered unlikely to result in deterioration in ecological potential for the Blackwater and Colne Transitional water body and Blackwater Outer Coastal water body. WFD Environmental Objectives are likely to be supported

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
				by the proposed SMP2 policies. The effect is considered minor positive.
Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of the estuary. However some local intervention is specified for areas where management will provide for the protection of communities (Brightlingsea, Point Clear) and MOD land on D8b and D8c. The intent however is minimal impact on coastal processes. This is balanced by a range of PDZs which seek to move the estuary towards a more natural system. Overall the effect is considered minor positive.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The MU provides enhanced protection for coastal communities and moves towards more sustainable approaches to management (in managed realignment areas). Overall the effect is minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides a range of policy, the intent of which is to move towards a more natural estuarine system. This is achieved through a combination of MR policy whilst protecting existing communities from erosion /flood risk – strategic management of the estuary. The effect is minor positive.
Maintenance of water supply in the coastal zone				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
		Changes of salinity in the freshwater aquifer attributable to SMP policy.		
Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for a balance of HTL to protect key assets and MR to maintain levels of intertidal habitat (important to the coastal landscape). No landscape features would be lost, and the estuary would develop into a more natural looking system. In the wider landscape context, the MU provides for a balance of key natural, cultural and social features with a minor positive effect.
Potential loss of historic and archaeological features on a dynamic coastline				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	As above, this MU will maintain a wide range of historic features (within or outside communities). On balance, all historic features, historic setting and undiscovered archaeology would be protected in this MU and the overall effect is minor positive

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, all NAI or MR PDZs were described as having moderate or high potential effects on archaeological sites. This accounts for approximately half of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on undiscovered archaeology. In discussions with EH, it was agreed that mitigation would involve time being allowed for investigation prior to any MR scheme taking place. Overall the effect is therefore minor negative.
Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce				
Protection of coastal towns and settlements				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for protection of all flood risk communities and the scope for intervention to protect erosion risk communities. The MU has been devised to offer a sustainable long term approach to protecting communities in this area, with an overall minor positive effect.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	The MU provides for the protection of all key features; adjacent to communities. A further issue however is the effects on the oyster fisheries at Brightlingsea and the Mersea channel – the effects of policy on these fisheries are not known and could be either negative or positive (this will be assessed further at the scheme level). Overall the effect is minor positive.
Protection of key coastal infrastructure				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU will not lead to the interruption of any road transport systems and the effect is considered neutral.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	The MU will protect the Colchester – Clacton rail line and the effect is therefore neutral.
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policies have the potential to interrupt linear access along the coast (especially the coastal paths within D5 and D6), however it is not anticipated that this would lead to the loss of access along the coast. The route would be diverted to accommodate the MR and policy reflects this intent. The effect is therefore neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
The need to maintain a balance of providing navigation and access to estuary communities				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The actual effect of policy is unknown, since the effects of MR and HTL policy are dependent on the scheme and its measures. It is anticipated however that policy within this MU at a strategic level contains nothing which would provide for effects on channels which cannot be mitigated at the scheme level. In addition to this MR at D5 would increase the tidal prism and help maintain the channel in the River Colne. The effect is therefore minor positive.

Table 5 **Management Unit E Mersea Island**

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	Two MR policies are provided which actively seek to address the loss of inter tidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Two PDZs in this assessment unit have been established as having an adverse effect on the integrity of international sites (Colne and the Blackwater Estuaries SPA and Ramsar sites) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable.
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to the loss of terrestrial habitat and agricultural land, to offset loss of intertidal areas through coastal squeeze. Since the MR to provide BAP will in part be over non-BAP habitat the effect is considered minor positive.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	Mersea Island lies adjacent to two SSSIs, the Colne and the Blackwater Estuaries. The overall intent of the MU is to provide a combination of HTL and MR on the island to balance loss of habitat through coastal squeeze with creation of habitat through MR. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan. Overall the effect is considered neutral.
Maintenance of environmental conditions to support biodiversity and the quality of life				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	MR policy in PDZ E2 and E4a will increase intertidal habitat around Mersea, which will be beneficial to the BQE. Overall the preferred policies for this management area are considered unlikely to result in deterioration in ecological potential. WFD Environmental Objectives are likely to be supported by the proposed SMP2 policies. The effect is considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of Mersea Island. However some local intervention is specified for areas where management will provide for the protection of communities (West Mersea) in epoch3 and at East Mersea (epoch1 and epoch2). Equally a HTL policy is provided to protect the B1025 road. The intent however is minimal impact on coastal processes and three MRs are also proposed. Overall the effect is considered minor positive.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The MU provides enhanced protection for coastal communities (East and West Mersea) and moves towards more sustainable approaches to managed area (in managed realignment areas. The overall effect is therefore minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides a range of policy, the intent of which is to move towards a more natural estuarine system. This is achieved through a combination of MR policy whilst protecting existing communities from erosion/flood risk. The effect is minor positive.
Maintenance of water supply in the coastal zone				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion. Changes of salinity in the freshwater aquifer attributable to SMP policy.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies could result in deterioration of the aquifer. It is considered that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for a balance of HTL to protect key assets and MR to provide or maintain levels of intertidal habitat (important to the coastal landscape). No landscape features would be lost, and the island/estuary would develop into a more natural looking system. The MRs result in the loss of agricultural land, but this is a small percentage of the agricultural land in this area. In the wider landscape however, the MU provides for a balance of key natural, cultural and social features with a minor positive effect.
Potential loss of historic and archaeological features on a dynamic coastline				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	This MU will maintain a wide range of historic features (within or outside communities). The HTL policies maintain communities, whilst the MR areas would not lead to the loss of any historic features or undiscovered archaeology. Overall the effect is considered minor positive since a range of Listed Buildings are located in

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
				East and West Mersea and also six SMs in the areas protected by HTL. .
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, all MR PDZs were described as having high potential effects on archaeological sites. This accounts for approximately 30% of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on undiscovered archaeology. In discussions with EH, it was agreed that mitigation would involve time being allowed for investigation prior to any MR scheme taking place. Overall the effect is therefore minor negative.
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Protection of coastal towns and settlements				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for protection of all flood risk communities (East Mersea) and erosion risk communities (West Mersea). The MU has been devised to offer a sustainable long term approach to protecting communities in this area, and an overall minor positive effect.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	There may be a localised effect on local oyster fisheries, but at present the nature of the effect is unknown. No essential features are lost elsewhere and the effect is therefore minor positive.
Protection of key coastal infrastructure				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU provides for the protection the B1025 road which is essential for access to communities on the island and the effect is therefore minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	Not applicable
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policies have the potential to interrupt linear access along the coast (especially the coastal paths within E2 and E4a), however it is not anticipated that this would lead to the loss of access along the coast. The route would be diverted to accommodate the MR and policy reflects this intent. The effect is therefore neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
The need to maintain a balance of providing navigation and access to estuary communities				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The MR E4a is likely to maintain flows in the Stroud Channel. The effect is therefore minor positive.

Table 6 Management Unit F Blackwater Estuary

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	Four MR policies are provided which actively seek to address the loss of inter tidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Four PDZs in this management unit have been established as having an adverse effect on the integrity of international sites (Blackwater Estuary and Dengie SPA and Ramsar) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to the loss of terrestrial habitat and agricultural land, to offset loss of intertidal areas through coastal squeeze. Since the MR to provide BAP will in part be over non-BAP habitat the effect is considered minor positive.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSI in this area is the Blackwater Estuary. The overall intent of the MU is to provide a combination of HTL and MR on the estuary to balance loss of habitat through coastal squeeze with creation of habitat through MR. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan. Overall the effect is considered neutral.
Maintenance of environmental conditions to support biodiversity and the quality of life				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	There will be some loss of intertidal habitat where SMP2 policies are HTL through rising sea levels and coastal squeeze but the overall ecological functioning of the system should be maintained where MR2 is proposed. Therefore, it is considered unlikely that there will be deterioration in ecological potential for the Blackwater and Colne Transitional water body as a result of SMP2 policies. WFD Environmental Objectives are likely to be supported by the proposed SMP2 policies. The effect is considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of the Blackwater Estuary. The MU provides for five MR areas (split between both shores in extent) and also protects communities at Goldhanger, Maldon, St Lawrence, Tollesbury and Bradwell. Overall the effect is considered minor positive.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The MU provides enhanced protection for coastal communities (Goldhanger, Maldon, St Lawrence, Tollesbury and Bradwell) and moves towards more sustainable approaches to managed area (in managed realignment areas. The overall effect is therefore minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides a range of policy, the intent of which is to move towards a more natural estuarine system. This is achieved through a combination of MR policy whilst protecting existing communities from erosion/flood risk. The effect is minor positive.
Maintenance of water supply in the coastal zone				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion. Changes of salinity in the freshwater aquifer attributable to SMP policy.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for a balance of HTL to protect key assets and MR to provide to maintain levels of intertidal habitat (important to the coastal landscape). No landscape features would be lost, and the estuary would develop into a more natural looking system. The MRs result in the loss of agricultural land and freshwater habitat in the case of F3 and F5 at Tolesbury Wick and Old Hall Marshes. Additionally the MR at Old Hall Marshes (F3) may result in the loss of two SMs (both decoy ponds). These features although historically significant are not considered significant in the local landscape. In the wider landscape however, the MU provides for a balance of key natural, cultural and social features with a minor positive effect.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Potential loss of historic and archaeological features on a dynamic coastline				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	This MU will maintain a wide range of historic features (within or outside communities). The HTL policies maintain communities which include several SMs at Maldon and a range of Listed Buildings (over 100). Additionally the Registered Battlefield at Maldon (Battle of Maldon) is protected by HTL policy. The MR policies would not lead to the loss of any Listed Buildings but would potentially lead to the loss of two SMs at Old Hall Marshes (F3) (both decoy ponds). Inundation may lead to a change in the form of the ponds, but not necessarily their loss. On balance, the effect of protecting features, offset against the effects on the decoy ponds remains minor positive.
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, all MR PDZs were described as having high potential effects on archaeological sites. This accounts for approximately 15% of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on undiscovered archaeology. In discussions with EH, it was agreed that mitigation would involve time being allowed for investigation prior to any MR scheme taking place. Overall the effect is therefore minor negative.
Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce				
Protection of coastal towns and settlements				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for protection of coastal communities at Tollesbury, Goldhanger, Maldon, Mayland, St Lawrence and Bradwell on Sea. The MU has been devised to offer a sustainable long term approach to protecting communities in this area, with an overall minor positive effect.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	The MU provides for the protection of key features including several sewage works and foreshore infrastructure in Maldon. The MR PDZs would not lead to the loss of any essential features apart from the loss of the caravan park at Steeple Bay Holiday Park and the adjacent sailing club in Steeple Bay (both of which could be relocated landwards to provide the same function). Overall the balance of effect is still considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Protection of key coastal infrastructure				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU provides for the protection the A414, B1026, B1018 roads and the effect is therefore minor positive.
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism, and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	The HTL policies in Maldon would maintain the location and function of the rail line and the effect is therefore minor positive.
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policies have the potential to interrupt linear access along the coast (especially the coastal paths within F3, F5, F12 and F14), however it is not anticipated that this would lead to the loss of access along the coast. The route would be diverted to accommodate the MR and policy reflects this intent. The effect is considered neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	The HTL policy in F15 will ensure the long term protection of the Bradwell Nuclear Power Station and effect is therefore minor positive.
The need to maintain a balance of providing navigation and access to estuary communities				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The MR policies in this MU are likely to provide enhanced flow in the estuary and help maintain navigable access in the estuary. The effect is therefore minor positive.

Table 7 **Management Unit G Dengie**

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	No MR policies are provided which actively seek to address the loss of inter tidal habitat through squeeze elsewhere in the frontage, the policy is for a continuation of uniform HTL policy. This continuation of management coupled with the effects of SLR (leading to loss of intertidal habitat) does not provide a balanced approach to management. The overall effect is considered major negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	The HTL policies in this assessment unit, may lead to a loss of designated intertidal habitat (on the Dengie and the Crouch and Roach SPA and Ramsar sites) This represents an adverse effect on site integrity and the overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to coastal squeeze on intertidal habitat on a frontage which is showing accretion in the central area of the MU (G3). The HTL policy in balance with the large scale accretion anticipated would have a neutral effect.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSI in this area is the Dengie. The key features on this site are tidal mudflat and saltmarsh. The overall intent of the MU is to provide HTL for this frontage which is showing ongoing accretion. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan. Overall the effect is neutral as policy is not affecting the extent of the designated features.
Maintenance of environmental conditions to support biodiversity and the quality of life				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	The section of coastline in PDZ G1 is currently eroding and HTL policy could result in the loss of habitat through sea level rise and coastal squeeze. However Blackwater Outer is presently at good ecological potential and as this defence unit will continue with present management deterioration in ecological potential is unlikely. Deterioration in ecological potential is also unlikely for G1 in the Blackwater and Colne water body due to the MR2 that is proposed in other PDZ that occur within that water body. The section of coastline in PDZ G2 and G3 along the Dengie peninsula is accreting under the present HTL policy. Therefore adopting HTL policy for this PDZ should

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
				not result in deterioration in ecological potential within the Blackwater Outer and Essex Coastal and Crouch water bodies. Overall the effect is anticipated to be neutral.
Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of the Dengue frontage which is accreting on the open coastal frontage of G2, but is witnessing coastal squeeze based localised erosion at (Sales Point) G1 and (Holliwell Point) G3. The intent of management is to allow for the development of the foreshore in G2 and part of G3, whilst HTL at the north and south. The reasons for HTL policies are to protect communities and historic features and due to the complex nature of the flood defence in those areas, which may be compromised of old waste material (with uncertainty relating to their composition). Overall the effect is considered neutral, since the HTL policies do not work with natural processes, whilst the HTL in G2 enables the natural accretion of the coast.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The MU provides for a uniform HTL policy along this frontage which will protect all coastal communities. The effect is considered minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides HTL policy in G2 which is accreting and therefore allows natural coastal development, but the HTL in G1 and G3 prevent erosion and the development of the coast. On balance the effect is therefore neutral.
Maintenance of water supply in the coastal zone				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
		Changes of salinity in the freshwater aquifer attributable to SMP policy.		
Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for the protection of all existing terrestrial areas, enables ongoing accretion of the open coastal frontage in G2, but may lead to the loss of intertidal habitat in G1 and G3 through coastal squeeze. Since the levels of accretion in G2 offset this, the overall effect is considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Potential loss of historic and archaeological features on a dynamic coastline				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	Due to the HTL policies in this MU, which are in part intended to protect historic features (such as the SMs of the Chapel of St Peters on the Wall in G1 and the WW2 minefield control towers in G3)) the effect is considered major positive.
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	As above, since the policy is HTL no negative effects are evident on this MU and areas such as the Othona Roman Fort are protected. The effect is therefore minor positive and not major positive, since it is acknowledged that there may be undiscovered assets seaward of the defences.
Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce				
Protection of coastal towns and settlements				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	Coastal communities in this MU are not at risk and the effect is therefore neutral.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	The MU provides for the protection of the beach (Bradwell on Sea beach in G1) and extensive areas of agricultural land (large areas of Grade 2 land). The effect is therefore minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Protection of key coastal infrastructure				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The roads in this frontage are minor unclassified roads (The B1021 is located out of the flood zone) and the effect is therefore neutral. .
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	Not applicable
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The HTL policies maintain access and the effect is therefore minor positive.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
The need to maintain a balance of providing navigation and access to estuary communities				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The MR policies in this MU may provide some degree of stability to the estuary mouths in G1 and G3; however this effect is considered limited. The effect therefore is considered neutral.

Table 8 **Management Unit H Crouch and Roach Estuaries**

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	Six MR policies are provided which actively seek to address the loss of inter tidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Six PDZs in this assessment unit have been established as having an adverse effect on the integrity of international sites (Crouch and Roach and Foulness SPA and Ramsar) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to the loss of terrestrial habitat and agricultural land, to offset loss of intertidal areas through coastal squeeze. Since the MR to provide BAP habitat will in part be over non-BAP habitat the effect is considered minor positive.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSIs in this area is the Crouch and Roach Estuary SSSI and the Cliff – Burnham SSSI. The cliffs are designated for the geological interests of avifaunal fossils in the Lower Eocene deposits. SMP policy will not have any impact on this site. The overall intent of the MU is to provide a combination of HTL and MR on the estuary to balance loss of habitat through coastal squeeze with creation of habitat through MR, overall the effect is considered neutral.
Maintenance of environmental conditions to support biodiversity and the quality of life				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	There will be some loss of intertidal habitat where the SMP2 policy is to HTL due to rising sea levels and coastal squeeze, but the overall ecological functioning of the system should be maintained where MR2 is proposed. Therefore it is considered unlikely that there will be deterioration in ecological status of the Crouch Transitional water body. Similarly given the size of the H16 frontage relative to

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
				Thames North Coastal and Thames Lower Transitional there is unlikely to be deterioration in ecological potential for these HMWBs. Overall the effect is anticipated to be neutral.
Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of The rivers Crouch and Roach. However, HTL policy is specified for areas where management will provide for the protection of communities (Burnham, S Woodham Ferrers, Hullbridge, North and South Fanbridge, Rochford, L & G Wakering & Canedon). This MU also includes six MR areas, including the extensive MR at Wallasea Island (H10). Overall the effect is considered minor positive.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		As above this MU provides for HTL to protect all existing communities. The overall effect is therefore minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides a range of policy, the intent of which is to move towards a more natural estuarine system. This is achieved through a combination of MR policy whilst protecting existing communities from erosion/flood risk. The effect is considered minor positive.
Maintenance of water supply in the coastal zone				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
		Changes of salinity in the freshwater aquifer attributable to SMP policy.		
Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for a balance of HTL to protect key assets and MR to provide and maintain levels of intertidal habitat (important to the coastal landscape). No landscape features would be lost, and the island/estuary would develop into a more natural looking system. The MRs result in the loss of agricultural land, but this is a small percentage of the agricultural land in this area. In the wider landscape however, the MU provides for a balance of key natural, cultural and social features. The effect is minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Potential loss of historic and archaeological features on a dynamic coastline				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	As above, this MU will maintain a wide range of historic features (within or outside communities). The HTL policies maintain communities, whilst the MR areas would not lead to the loss of any historic features. Overall the effect is considered minor positive.
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, all MR PDZs were described as having high potential effects on archaeological sites. This accounts for approximately 30% of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on archaeology. A key factor however is that in discussions with EH, it was stated that mitigation would be provided to allow time for site investigations and MR PDZs have been specified across the timeline of the plan to accommodate this and time for site investigation is a requirement of MR policy also MRs are not clustered into one epoch. Overall the effect is minor negative.
Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce				
Protection of coastal towns and settlements				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for protection of all coastal communities. The MU has been devised to offer a sustainable long term approach to protecting communities in this area, and an overall minor positive effect.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	No essential features are expected to be lost in this MU the effect is therefore minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Protection of key coastal infrastructure				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU provides for the protection of the A132, B1012 (in Epoch 3) and local unclassified roads which are essential for access to communities and the effect is therefore minor positive.
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	The MU provides for the protection of the rail line on the north shore of the Crouch and a small section of the rail line in Rochford, and the effect is therefore minor positive.
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policies have the potential to interrupt linear access along the coast, however it is not anticipated that this would lead to the loss of access along the coast. The route would be diverted to accommodate the MR and policy reflects this intent. The effect is therefore neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
The need to maintain a balance of providing navigation and access to estuary communities				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The MR in this MU will help maintain the integrity of the channels in the Crouch and the Roach. The effect is therefore minor positive.

Table 9 **Management Unit I Foulness, Potton and Rushley Islands**

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	One MR policy is provided (on this three PDZ based unit) which actively seeks to address the loss of inter tidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Two PDZs in this management unit have been established as having an adverse effect on the integrity of international sites (Foulness SPA and Ramsar) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to the loss intertidal areas through coastal squeeze. However, due to the nature of this area, which is in an accretional state, no loss of this habitat is expected and the effects are neutral.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSI in this area is Foulness SSSI. The overall intent of the MU is to provide a combination of HTL and MR on this frontage to balance loss of habitat through coastal squeeze with creation of habitat through MR. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan. Overall the effect is considered neutral due in part to the accretional nature of this MU.
Maintenance of environmental conditions to support biodiversity and the quality of life				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	SMP2 policies which have the potential to cause this water body to fail one or more objectives include those associated with a HTL policy at PDZ I1a (Foulness). HTL policy in this PDZ may result in the loss of intertidal habitat through sea level rise and coastal squeeze, which will not be countered by MR2 policies that are present in this water body. Overall the effect is considered minor negative.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of the Foulness frontage (including Potton and Rushley Islands). The MU does however take a HTL approach to the majority of the frontage with a small MR in Rushley Island. The intent being to protect MoD land through HTL. Overall the effect is considered minor negative.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The HTL policies protect all existing settlements (Church End, Courtsend and Great Potton) and the effect is therefore minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides for a large expanse of HTL policy with only minor MR to offset this in Rushley Island. It should be remembered however, that within close proximity to this MU (in the Roach system) this SMP provides for an extensive MR at Wallasea Island. On balance therefore the MU is considered minor negative, since the effects are to some degree offset be adjacent actions.
Maintenance of water supply in the coastal zone				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
		Changes of salinity in the freshwater aquifer attributable to SMP policy.		
Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for extensive HTL which will maintain all terrestrial features, Some limited areas of saltmarsh will be lost, but the extensive frontage of I1a is expected to provide consistent accretion. The overall effect is considered neutral.
Potential loss of historic and archaeological features on a dynamic coastline				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	The HTL will protect a SM (a Roman-British Burial Site) and 17 listed buildings. Overall the effect is considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, the MR PDZs were described as having high potential effects on archaeological sites. This accounts for approximately 10% of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on undiscovered archaeology. In discussions with EH, it was agreed that mitigation would involve time being allowed for investigation prior to any MR scheme taking place. Overall the effect is therefore minor negative.
Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce				
Protection of coastal towns and settlements				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU has been devised to offer a sustainable long term approach to protecting communities in this area, and an overall minor positive effect.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	No essential features are expected to be lost in this MU the effect is therefore minor positive.
Protection of key coastal infrastructure				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU provides for the protection of the local unclassified roads which are essential for access to communities and the effect is therefore minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	Not applicable
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR on Rushley Island will not lead to the loss of any established rights of way. The effect is therefore neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
The need to maintain a balance of providing navigation and access to estuary communities				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The MR in this MU will help maintain the integrity of the channels in the Roach. The effect is therefore minor positive.

Table 10 Management Unit J Southend-on-Sea

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	No policies are provided for managed realignment in this unit. The intent of policy is to hold the line in front of Southend, an urban frontage. This is a historical continuation of decades of previous management and the overall effect is considered neutral. Losses due to squeeze in this frontage are being addressed by the Thames Estuary 2100 project.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	HTL policy in this management unit have been established as having an adverse effect on the integrity of international sites through the HTL policies leading to coastal squeeze. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to the loss intertidal areas through coastal squeeze, which would be lost in this MU through the HTL policy in front of Southend. The effect therefore is minor negative.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSI in this area is Benfleet and Southend Marshes and the Foulness SSSI. The overall intent of the MU is to provide protection to Southend, and as a result intertidal features will be lost through coastal squeeze. The effect therefore is minor negative.
Maintenance of environmental conditions to support biodiversity and the quality of life				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	Under a HTL policy, there would be no cliff retreat throughout the Southend-on-Sea frontage. The position of the shoreline will be held largely at the same position, although there would be local changes to the foreshore with likely accretion of sands updrift of the groynes and conversely there could also be some localised erosion downdrift. Beach erosion/accretion rates are expected to remain unchanged. The development of the intertidal flats is not constrained by the defences. Overall the effect is anticipated to be neutral.
Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species	This MU intends to provide protection for this frontage and the Southend community. The intent of the MU is protection of this regionally important town, the location of which precludes allowing for natural coastal evolution in this area. Since this is a historical pattern of management. Overall the effect is considered minor

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
needs to be maintained albeit within a dynamic context.			Population Communities	negative.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The HTL policies will protect Southend and the effect is therefore minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		This MU works against coastal processes in protecting Southend (a historical development of this area). Overall the effect is minor negative.
Maintenance of water supply in the coastal zone				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
		Changes of salinity in the freshwater aquifer attributable to SMP policy.		
Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for the maintenance of Southend and its foreshore, which is a key element in the local and regional landscape. The effect therefore is minor positive.
Potential loss of historic and archaeological features on a dynamic coastline				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	The HTL will protect all historic features on this frontage. Overall the effect is considered minor positive.
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	Since the EMP2 policy for this MU is HTL, all archaeological features are maintained and the effect is minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce				
Protection of coastal towns and settlements				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU will protect all coastal communities and the effect is therefore overall minor positive effect.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	No essential features are expected to be lost in this MU the effect is therefore minor positive.
Protection of key coastal infrastructure				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU provides for the protection of the road network in Southend which are essential for access to communities and the effect is therefore minor positive.
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	All rail lines are maintained and the effect is considered minor positive.
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	Coastal access will be maintained and the effect is considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
The need to maintain a balance of providing navigation and access to estuary communities				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	This MU will have a negligible effect on navigation within the Thames estuary or on local channels. The effect is therefore neutral.

ANNEX II

Summary of Consultation Responses

RESPONSE TO CONSULTATION ON ESSEX SEA SCOPING REPORT

Responses Received

RICHARD ATKINS, CIVIL ENGINEER
SOUTHEND BOROUGH COUNCIL

Comments received related to the specifics of the Southend Frontage and are detailed as follows:

2.7.2 My information is that in 2008, Jubilee Beach did not have a blue flag, although Shoebury East, Shoebury Common and Three Shells Beaches did.

Table 2.10 Clacton Pier (pierlet actually) is mentioned, but Southend Pier isn't

Appendix D description. I don't recognise Southend as the most populous and densely developed community in the Plan from this description. The "fairly limited …..small sections of the seafront" within the flood zone actually cover about 9 km linearly and extend up to 1.5km inland. Similarly the "some" properties within the flood zone amount to several thousand.

RACHEL BALANTYNE, REGIONAL SCIENCE ADVISOR
ENGLISH HERITAGE

Comments received were supportive of the overall document, but made specific suggestions relating to the assessment criteria and indicators provided within the assessment framework.

A revised landscape indicator was provided, which provided a more specific account of the role of heritage features within the coastal landscape. Additionally, amendments were suggested relating to how heritage features are collectively described as heritage assets (indicators column of the assessment framework).

PHIL STURGES, PLANNING CONSERVATION ADVISOR
NATURAL ENGLAND

Natural England were supportive of the content of the document and the manner in which it addressed environmental issues on the Essex and south Suffolk coast. Natural England did however suggest that regard is given to the output of the HRA and the identified effects on international sites (as a legal requirement) in the assessment of the plan.

Response within the Environmental Report

In response to the comments of Southend Council the following changes were made in the Environmental Report:

1) **2.7.1 Paragraph 1.** Eight local planning documents now referred to and listed. List now includes Suffolk Coastal District Council and Babergh.

2) **2.7.1 Paragraph 2.** Text amended to read seven local authorities.

3) **2.7.2.** Blue Flag Beaches. Text updated with the 2009 Blue Flag list for Essex.

4) **Table 2.11**. Reference to Southend Pier included.

5) Appendix D – Unit 9. Description of Southend-on-Sea modified in line with comments to read:

'*Southend-on-Sea is the most populous and densely developed community in the Essex and south Suffolk SMP area. The land in the tidal flood zone extends 9km linearly and up to 1.5km inland of the Southend-on-Sea frontage. There are a variety of defences including sea walls, groynes and revetments.*

A significant number of properties lie within the 1 in 1000 year flood zone at Shoeburyness, South church and behind the seafront at Southend. Sections of the B1016 and the railway line at Leigh-On-Sea are within the flood zone. The golf course at Southchurch provides recreational amenity. The seafront at Southend-On-Sea has important recreational and tourism value with its attractions including the beach, pier, aquarium and museum, while Shoeburyness has military importance as a Ministry of Defence firing range.'

The suggested indicator provided for landscape has been used in the environmental report. The specific wording for indicators has been maintained to be consistent with other SMP SEAs, and retains the suite of features suggested by English Heritage.

In line with Natural England's comments the role of the Habitats Regulations has been accorded due weight in the assessment. Adverse impact on international sites is determined as major negative impact.

ANNEX III

Consideration of the Effects of SMP Policy on Environmental Receptors

Potential positive effects of SMP policy on SEA Environmental Receptors

SMP OPTION	POSITIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON S1 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
Hold the line (HTL)	Protection of communities and infrastructure located within the coastal flood zone;	The SMP is not considered likely to have any effect on parameters for air quality.	The protection of water abstraction sources	The protection of agricultural land	Protection of key features in the coastal landscape	Protection of key historical assets			Protection of key community assets
	Protection of habitat landward of defences;			The protection of soil as an integral element of habitat	Protection of key features in the coastal landscape		Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	
	Protects freshwater resources (e.g. abstractions & boreholes);		The protection of water abstraction sources	The prevention of salinisation of soils					Protection of key community assets
	Provides stability to areas of coastline, within a wider management context;				Provision of a natural and dynamic coastal landscape		Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	Protection of key community assets
	Protects economic assets located behind defences; and					Protection of key historical assets			Protection of key community assets
	Provides protection to ecological, cultural and historical assets landward of the defences.				Protection of key features in the coastal landscape	Protection of key historical assets	Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	Protection of key community assets
Advance the line (ATL)	Provides additional space for communities;			May provide for increased areas of agricultural land					Provides opportunity to increase area of land available for coastal communities
	Protection of communities and infrastructure located within the coastal flood zone;			The protection of agricultural land	Protection of key features in the coastal landscape				Protection of key community assets
	Protection of habitat landward of defences;			The protection of soil as an integral element of habitat			Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	
	Protects freshwater resources (e.g. abstractions and boreholes);		The protection of water abstraction sources						Protection of key community assets
	Protects economic assets located behind defences; and			The protection of agricultural land		Protection of key historical assets			Protection of key community assets
	Provides protection to ecological, cultural and historical assets landward of the defences.				Protection of key features in the coastal landscape	Protection of key historical assets	Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	Protection of key community assets
Managed realignment (MR)	Coastal habitats allowed to move landwards under rising sea levels				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Creation of habitat to aid UKBAP; (United Kingdom Biodiversity Action Plan) and local BAP (Biodiversity Action Plan) targets;				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	

SMP OPTION	POSITIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON S1 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
	Habitat created for juvenile fish and other aquatic organisms (benefits to environment and fishing communities);						Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	Protects the viability of commercial and recreational fishing
	Reduces flood risk;								Protection of key community assets
	Promotes natural coastal processes;		May lead to enhanced water quality		Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Contributes towards a more natural management of the coast; and		May lead to enhanced water quality		Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Creation of high tide roosts and feeding areas.				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
No active intervention (NAI)	Coastal habitats allowed to move landwards under rising sea levels;				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Promotes natural coastal processes; and		May lead to enhanced water quality		Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Contributes towards a more natural management of the coast.				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	

Potential negative effects of SMP Policy on SEA Environmental Receptors

SMP OPTION	NEGATIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON SI 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
Hold the line (HTL)	Coastal squeeze (loss of habitat);	The SMP is not considered likely to have any effect on parameters for air quality or climatic factors.			Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Interruption of coastal processes;		Adverse effects on water quality through turbidity changes etc.		Reduction in the dynamic quality of the coastal landscape		Shifts in habitat composition or function	Reduction in abundance and diversity of species	
	May increase flood and coastal erosion risk elsewhere;			Potential degradation of soil quality through intrusion		Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Increased risk to existing community features
	Promotes unsustainable land use practices with the coastal flood zone;								Impacts on sustainability of communities
	Diverts limited resources away from an adaptation response to rising sea levels; and					Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Effects on the resourcing of other community related activities
	Requires ongoing commitment to future investment in maintenance and improvement.				Introduction of defence features into the area which detract from the coastal landscape	Need for expenditure on site investigation prior to loss through inundation			Potential impacts of expenditure on flood defence and the knock on effects of this to other areas of public and private expenditure
Advance the line (ATL)	Reduction in extent of coastal habitat;				Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Change in functionality of habitat;						Shifts in habitat functionality	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Increased coastal squeeze;				Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Interruption of coastal processes;		Adverse effects on water quality through turbidity changes etc.				Shifts in habitat functionality	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Effect on marine habitat;						Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community

SMP OPTION	NEGATIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON SI 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
	May increase rate of coastal erosion either side of the advanced line.		Adverse effects on water quality through turbidity changes etc.	Potential degradation of soil quality through intrusion	Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Impacts on other features important for community purposes
Managed realignment (MR)	Reduction in extent of habitat landwards of defences;				Shifts in the habitat mosaic as a function of the local landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Change in nature of habitat to landward of defence;				Shifts in the habitat mosaic as a function of the local landscape		Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Impact upon aquifers and abstractions;		Loss of abstraction points and intrusion into aquifers						Impacts on water supply to communities
	Loss of communities or community assets;		Loss of abstraction points and intrusion into aquifers	Potential degradation of soil quality through intrusion		Loss of heritage features			Reduction in the amenity of coastal communities
	Loss of heritage and cultural features; and					Loss of heritage features			Reduction in the amenity of coastal communities
	Loss of agricultural land			Loss of agricultural land/soil					Impacts on the character of local communities and the local economy
No active intervention (NAI)	Lack of certainly of effects and time for adaptation;						Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Provision of community features in unsustainable locations
	Increased risk of inundation to landward habitats under rising sea levels;					Loss of known or undiscovered archaeological resources	Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Impact upon aquifers and abstractions;		Loss of abstraction points and intrusion into aquifers						Impacts on water supply to communities
	Loss of communities or community assets; and		Loss of abstraction points and intrusion into aquifers	Loss of agricultural land/soil		Loss of heritage features			Reduction in the amenity of coastal communities
	Loss of heritage and cultural features.					Loss of heritage features			Reduction in the amenity of coastal communities

ANNEX IV

Scoping Report

L9 INTRODUCTION AND BACKGROUND

This section includes:

- Why we are using Strategic Environmental Assessment;
- Development of the study area; and
- The scope and structure of this document.

L9.1 Why we are using Strategic Environmental Assessment (SEA)

SEA provides a systematic appraisal of the potential environmental consequences of high-level decision-making (i.e. plans, policies and programmes). By addressing strategic level issues, SEA aids the selection of the preferred options, directs individual schemes towards the most appropriate solutions and locations and helps to ensure that resulting schemes comply with legislation and other environmental requirements.

The Defra SMP guidance (Defra, 2006) states that the environmental effects of all policies must be considered before deciding which policies will be adopted. Consideration should be made with regards to both the positive and negative effects of options on wildlife and habitats, populations and health, soil, water, air, climate factors, landscape, cultural heritage and the intrinsic relationship between these.

Under Directive 2001/42/EC of the European Parliament and European Council on the assessment of the effects of certain plans and programmes on the environment, a strategic environmental assessment (SEA) must be made of plans and programmes that are required by legislative, regulatory or administrative provisions. SMPs 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 **although it is not a statutory obligation**, it is recommended (Defra, 2006) that operating authorities assess policies using the approach described in the Directive. The legislative act which transposes the Directive into domestic law is the Environmental Assessment of Plans and Programmes Regulations (SI 1633, 2004). The main aim of the EU Directive 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*".

This document represents the first stage in the process of providing an SEA for the Essex SMP.

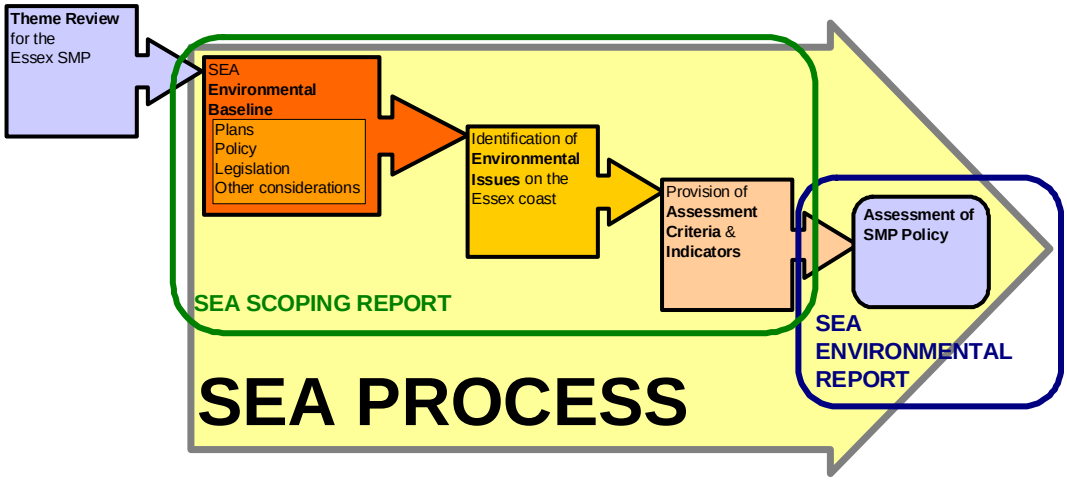
During the preparation of this document we have utilised, were applicable, the guidance provided by the following:

- Defra (2004). . . . Guidance on SEA;
- Defra (2006). . . . Shoreline Management Plan guidance: Volume 1: Aims and requirements;
- Environment Agency (2009). . . . Operational Instruction: SEA;
- Environment Agency (2005). . . . SEA Good Practice Guidelines; and
- ODPM (2005). . . . A Practical guide to the SEA Directive

Further information on the assessment methodology used for this SEA is provided in **Section 2.**

L9.2 The SMP context for the SEA

The review of SMPs is being developed to ensure that sustainable coastal erosion and flood risk management policies are provided to deal with existing and emerging factors and issues in the coastal zone. The SMP provides the opportunity to develop policy for sustainable shoreline management, which is rooted in a consideration of the environmental, social and economic issues which are evident on a given coastal cell.



The SEA process to accompany the production of the SMP is intended to ensure that consideration of the environmental issues relating to the coast is central to the development and evaluation of policy. This SMP therefore provides the mechanism to support a structured evaluation of the environmental issues relating to the Essex coast and to develop assessment criteria which are focussed on these issues. The evaluation of policy can therefore be shaped and evaluated in a targeted, specific manner. The following sections summarise the approach taken to this task, and how environmental issues have been identified and structured into assessment criteria.

This section explains the SEA process including:

- The process for the development of assessment criteria against which the environmental effects of SMP policy will be evaluated;
- The methodology for baseline data and information collection and identification of any data gaps and/or uncertainty; and
- The prediction and evaluation methodology used for assessing policy.

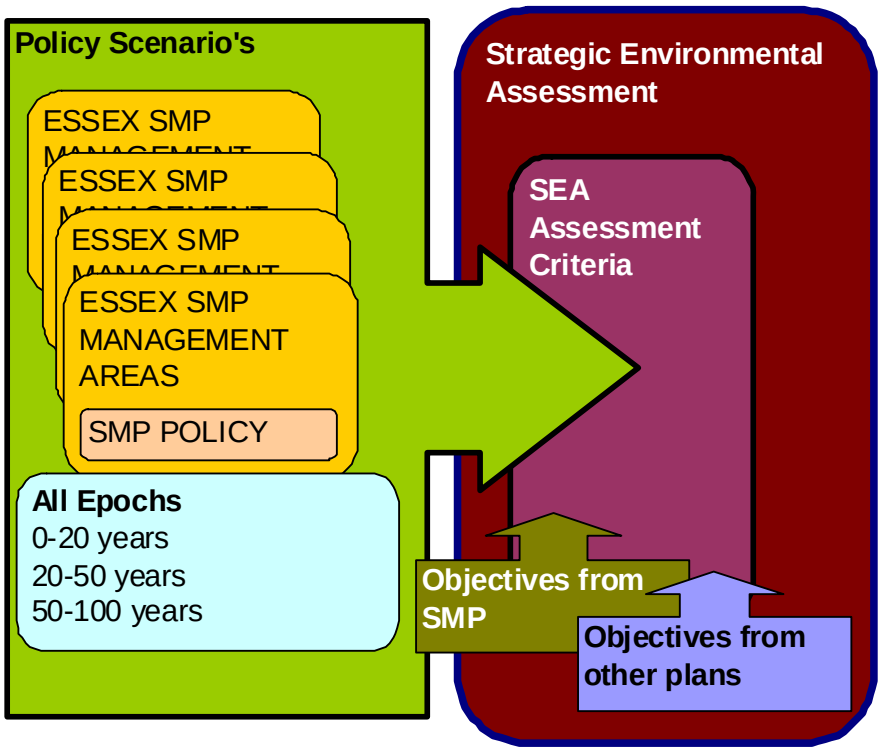
Within this SEA Scoping Report and in a manner analogous to that used throughout the SMP process (Defra, 2006), the term environment is used to cover landscape and natural beauty, wildlife, habitats, and buildings, sites and objects of archaeological, architectural or historical interest, human health, population, water air, climatic factors and material assets. In considering the effects on the environment within the SEA, assessment criteria will reflect the key environmental issues within the SMP area.

The SEA process will follow a simple process which combines the specifics of the SMP process with the stages of an SEA provided in the guidance suite. In regards to the current stage of SMP policy development for the Essex coast, the SEA will therefore be

used to determine the potential effects of policy options on the environment of the Essex coast (with a specific focus on key environmental issues).

The purpose of this scoping stage is to establish the environmental baseline and based on this identify the key environmental issues to be considered during subsequent stages of the SEA. This includes the **assessment criteria** which will provide the basis for the assessment of SMP **policy** (the assessment criteria will be harmonious and consistent with the objectives of the SMP), which will then be considered within the course of producing the SMP (i.e. the evaluation of SMP policy options).

Strategic Environmental Assessment of SMP Policy



A suite of **assessment criteria** for the SMP process will be developed in this report, based on a review of pertinent plans, policy, legislation and other environmental factors. This review will be provided in the context of the environmental baseline for the assessment. One of the key sources of information within this process will be the Theme Review and Site Characterisation Reports which were developed as a key component of the SMP process. The Theme Review and Site Characterisation Reports for the Essex coast provide a detailed account of all the features located in the coastal zone (social, economic and environmental) and provide the basis for a consideration of the key issues facing shoreline management in this area.

The actual derivation of assessment criteria is therefore a simple expression of the factors which will need to be addressed, in establishing the likely significant effects of the SMP in response to key environmental issues.

L9.3 Study Area

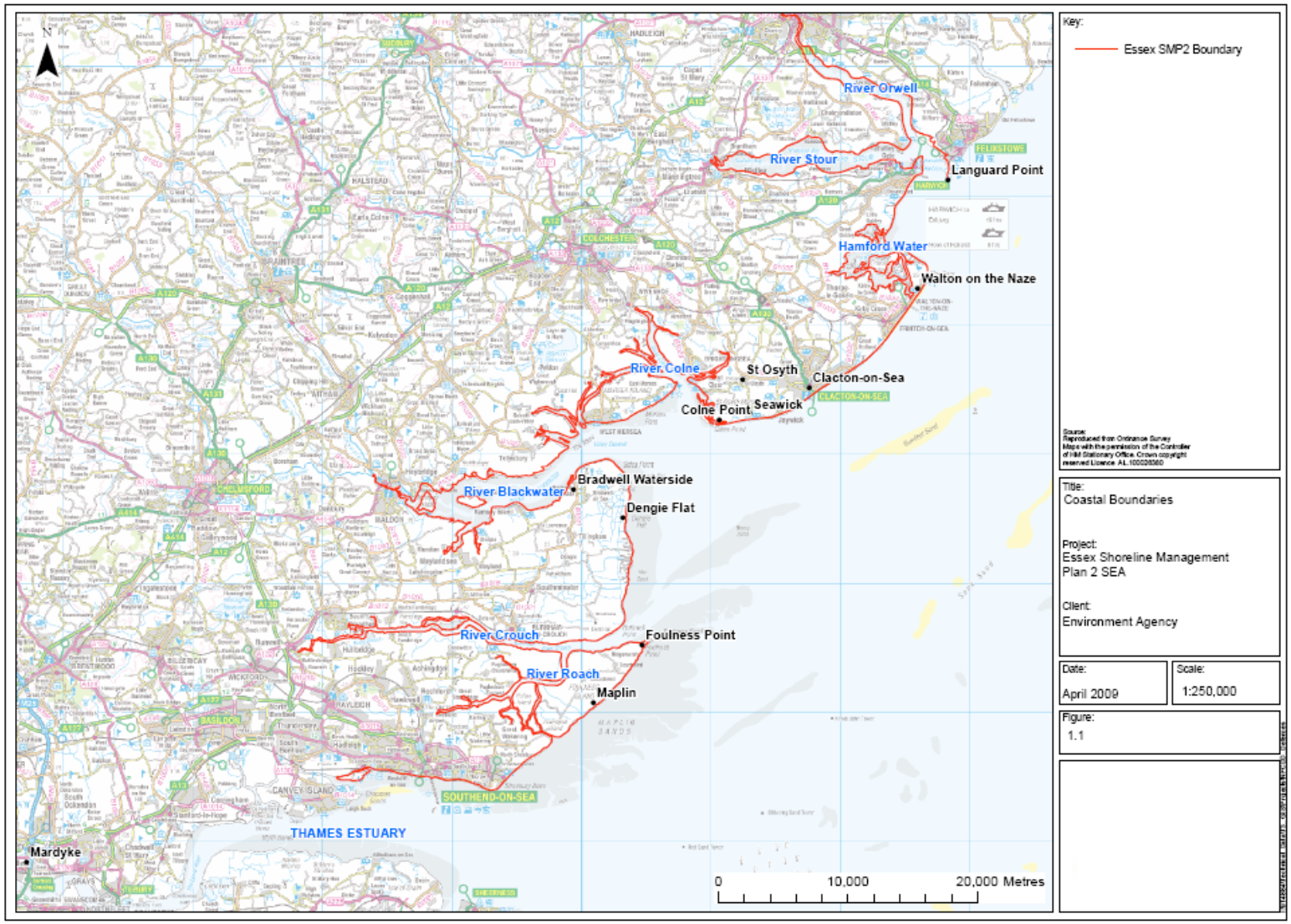
The Essex Shoreline Management Plan (SMP) study area encompasses approximately 440 km of coastline, stretching from Felixstowe Landguard Point (Ordnance Survey Grid

Reference TM 283 311) to the western tip of Two Tree Island, Southend-on-Sea (Ordnance Survey Grid Reference TQ 810 849) and is presented in **Figure 1.1**.

The SMP identifies areas potentially at risk from coastal flooding or erosion or physical coastal change over the next 100 years. The inland boundary is defined principally in relation to these areas of risk and change, but extends to areas and interests which may be affected by both directly and more indirectly by this risk and this is the rationale for selecting the 1 in 1000[†] year flood zone as the area of study. In terms of the estuaries, the SMP covers consideration of areas where management may influence or be influenced by the behaviour of the open coast shoreline.

[†] The area defined as having a 0.1% (1 in 1000) chance of inundation per annum

Figure 1.1 **Extent of coastline covered under the Essex SMP2 SEA.**



L9.4 Scope and Structure of the Document

This Scoping Report comprises six sections, of which this introduction forms **Section One**. Additional and background information is included within the **Appendices**.

> The sections within this Strategic Environmental Assessment Scoping report are as follows:
>
> **Section One** introduces this document and sets the context for the use of SEA within the SMP process. . . . In addition, this section explains rationale behind the SMP itself and describes the implication of the SMP on the wider environment;
>
> **Section Two** provides the baseline data associated with the Suffolk coastline, including pertinent policies and legislation;
>
> **Section Three** describes the relevant environmental issues and presents the derived assessment criteria;
>
> **Section Four** presents the approach for consultation and describes how key issues raised through the consultation process will be considered within the SEA process;
>
> **Section Five** provides an account of upcoming steps in this SEA process, as it aligns itself with the production of the SEA;
>
> **Section Six** provides references for this document;
>
> **Appendix A** presents plans and policy pertinent to the SEA process;
>
> **Appendix B** presents legislation pertinent to the SEA process;
>
> **Appendix C** presents information pertaining to sites of conservation importance within the study area;
>
> **Appendix D** presents further baseline information;
>
> **Appendix E** presents information for consideration of the potential effects of the SMP on environmental receptors; and
>
> **Appendix F** presents cross sectional diagrams of the study area. . . .

The purpose of this Scoping Report is to clearly express the key environmental issues to be considered within the SEA. This document therefore provides the opportunity to review and refine the issues which have been initially identified, and to therefore provide focus to the assessment stage, relevant to the Essex coast.

L9.5 Shoreline Management Plans (SMPs)

L9.5.1 SMP aims and objectives

A Shoreline Management Plan (SMP) is a large-scale assessment of the risks associated with coastal processes and aims to reduce the risks to the social, economic,

natural and historical environment. An SMP aims to manage risk by using a range of methods which reflect both national and local priorities, to (Defra, 2006):

- Reduce the threat of flooding and erosion to people and their property; and
- Benefit the environment, society and the economy as far as possible, in line with the Government's 'sustainable development principles'.

The first generation of SMPs were produced for the coastline of England and Wales in the late 1990s and were based on sediment cell boundaries which related to the movement of sand and shingle along the coast. The boundaries of these cells were originally set at locations where the net 'along shore' movement of sand and shingle changed direction. In some instances, the area covered by an SMP differed from these sediment cell boundaries, due to different requirements, such as the area covered by a coastal authority. However, for the SMP reviews a behavioural systems[‡] approach was recommended, leading to slightly different boundaries to the first generation (Defra, 2006).

The objectives of an SMP must be in line with the Government's strategy for managing risks from floods and coastal erosion and should (Defra, 2006):

- Set out the risks from flooding and erosion, to people and the developed, historic and natural environment within the SMP area;
- Identify opportunities to maintain and improve the environment by managing the risks from floods and coastal erosion;
- Identify the preferred policies for managing risks from floods and erosion over the next century;
- Identify the consequences of putting the preferred policies into practice;
- Set out procedures for monitoring how effective these policies are;
- Inform others so that future land use, planning and development of the shoreline takes account of the risks and the preferred policies;
- Discourage inappropriate development in areas where the flood and erosion risks are high; and
- Meet international and national nature conservation legislation and aim to achieve the biodiversity objectives.

The most appropriate option for shoreline management will depend on the section of coastline in question and on technical, environmental, social and economic circumstances. The four options considered for shoreline management in the second generation SMPs are presented in **Table 1.1**.

Table 1.1 Options used in SMP development

SMP option	Description of option
Hold the line (HTL)	Hold the existing defence line by maintaining or changing the standard of protection. This policy will cover those situations where work or operations are carried out in front of the existing defences (such as beach recharge, rebuilding the toe of a structure, building offshore breakwaters and so on), to improve or maintain the standard of protection provided by the existing

[‡] The current program of SMPs around the coast is a review of the first generation of reports produced in the 1990s and reflects the availability of new coastal processes information, new considerations (site designations etc) and less uncertainty about climate change.

SMP option	Description of option
	defence line. You should include in this policy other policies that involve operations to the back of existing defences (such as building secondary floodwalls) where they form an essential part of maintaining the current coastal defence system.
Advance the line (ATL)	Advance the existing defence line by building new defences on the seaward side of the original defences. Using this policy should be limited to those policy units where significant land reclamation is considered.
Managed realignment (MR)	Managed realignment by allowing the shoreline to move backwards or forwards, with management to control or limit movement (such as reducing erosion or building new defences on the landward side of the original defences).
No active intervention (NAI)	No active intervention, where there is no investment in coastal defences or operations.

Within the development of an SMP, an epoch (time periods) based approach is used for planning purposes, with the three epochs being 0 – 20 (2005 – 2025), 20 – 50 (2025 – 2055) and 50 – 100 (2055 – 2105) years hence.

L9.5.2 Implications of SMP policy on the wider environment

Each of the SMP policies presented in **Table 1.1** has the potential to impact the wider environment in one or more ways. **Table 1.2** presents potential implications of each option.

Table 1.2 Potential generic implications of each SMP option

SMP option	Positive impacts	Negative impacts
Hold the line (HTL)	• Protection of communities and infrastructure located within the coastal flood zone; • Protection of habitat landward of defences; • Protects freshwater resources (e.g. abstractions & boreholes); • Provides stability to areas of coastline, within a wider management context; • Protects economic assets located behind defences; and • Provides protection to ecological, cultural and historical assets landward of the defences.	• Coastal squeeze (loss of habitat); • Interruption of coastal processes; • May increase flood and coastal erosion risk elsewhere; • Promotes unsustainable land use practices with the coastal flood zone; • Diverts limited resources away from an adaptation response to rising sea levels; and • Requires ongoing commitment to future investment in maintenance and improvement.
Advance the line (ATL)	• Provides additional space for communities; • Protection of communities and infrastructure located within the coastal flood zone; • Protection of habitat landward of defences; • Protects freshwater resources (e.g. abstractions & boreholes);	• Reduction in extent of coastal habitat; • Change in functionality of habitat; • Increased coastal squeeze; • Interruption of coastal processes; • Effect on marine habitat; and • May increase rate of coastal erosion either side of the advanced line.

SMP option	Positive impacts	Negative impacts
	• Protects economic assets located behind defences; and • Provides protection to ecological, cultural and historical assets landward of the defences.	
Managed realignment (MR)	• Coastal habitats allowed to move landwards under rising sea levels • Creation of habitat to aid UKBAP; (United Kingdom Biodiversity Action Plan) and local BAP (Biodiversity Action Plan) targets; • Habitat created for juvenile fish and other aquatic organisms (benefits to environment and fishing communities); • Reduces flood risk; • Promotes natural coastal processes; • Contributes towards a more natural management of the coast; and • Creation of high tide roosts and feeding areas.	• Reduction in extent of habitat landwards of defences; • Change in nature of habitat to landward of defence; • Impact upon aquifers and abstractions; • Loss of communities or community assets; and • Loss of heritage and cultural features;
No active intervention (NAI)	• Coastal habitats allowed to move landwards under rising sea levels; • Promotes natural coastal processes; and • Contributes towards a more natural management of the coast.	• Lack of certainly of effects and time for adaptation; • Increased risk of inundation to landward habitats under rising sea levels; • Impact upon aquifers and abstractions; • Loss of communities or community assets; and • Loss of heritage and cultural features.

L9.5.3 Implications of SMP policy on environmental receptors

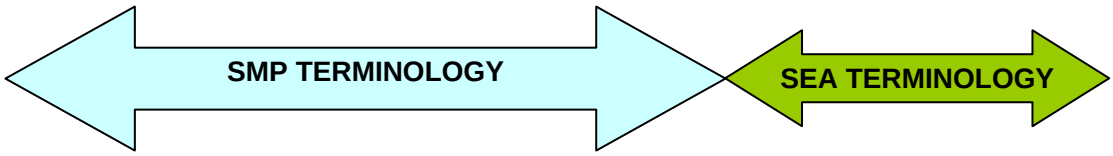
Defra SEA guidance (Defra, 2004) identifies a series of environmental receptors, which should form the initial basis and scope of the SEA. The receptors are the environmental features which may be impacted by the effects of the SMP.

The SMP guidance requires that the SMP is developed in response to a consideration of the environmental features of the coast, features which need to be assessed to determine the nature and characterisation of the coast. There is a difference of language here between the building block of the SEA and the SMP. It is necessary therefore to clarify how SMP features relate to SMP receptors, and to then establish how the SMP may impact on the receptors. A cross reference of the manner in which SEA receptors relate to SMP terminology is provided below in **Table 1.3**.

The SEA Regulations require that for each environmental receptor, and initial appraisal is provided relating to how the SMP may impact each specific receptor. This is provided in **Appendix E**. A summary of the overall potential effects of the SMP on the environment is provided in Table 1.3 below. The receptors developed for the Essex SMP SEA have been aggregated from the SEA Regulations receptors due to the nature of the SMP process and its application across the coast; hence, biodiversity, fauna and flora has been separated into two receptors, habitats and species, as the assessment of impacts upon these receptors can be better quantified by this division

Table 1.3 SMP and SEA Terminology

SMP Issues & Objectives	SMP Thematic Review	SEA Receptor
Environment	**Natural environment**	**Habitats**
		Species
		Air, climatic factors and water
	Agriculture	**Soil**
	Landscape and character	**Landscape**
		Material assets
		Population
Heritage	**Historic environment**	**Cultural heritage**
Commercial	**Current and future land use**	**Population and communities**
Recreation		**Population and communities**
Hard assets		**Population and communities**



Collectively, the impacts on receptors can then be traced back, to establish how the SMP may influence the environment. This step provides clarity relating to how the environment has been a consideration in SMP production and assessed in the context of the SEA. Simply, the SMP process therefore provides an integral element in the development of SMP policy, and how policy options are evaluated and developed.

The assessment in **Appendix E** provides an illustration that all SMP policy options have the potential to have an impact on all SEA receptors, with the exception of air. Air has been scoped out as a receptor potentially effected by the SMP, since no pathway was identified for this effect. SMP policy concerns itself with land, water and the tidal interface as a spatial area, no instances were identified were SMP policy could have any impact, positive or negative on air quality.

The identification of receptors which may be impacted by the SMP will provide the focus for the subsequent assessment.

L9.6 Appraisal methodology

Due to the nature of the Essex SMP area, policy appraisal will be undertaken across eleven areas of coastline, as defined by the coastal cross-section diagrams (Royal Haskoning, 2008a). Undertaking the analysis in this manner will allow for a systematic and integrated appraisal of SMP policy across the Essex coastline. The cross-sections are based upon estuarine and open coast areas and will allow a holistic interpretation of the impacts of SMP policy. These cross-sections are presented in **Appendix F** and characterise the following areas of coastline:

- River Orwell;
- River Stour;
- Hamford Water;
- Tendring Peninsula;
- Colne Estuary;
- Blackwater Estuary;

- Dengie Flat;
- River Crouch;
- River Roach;
- Foulness; and
- Southend.

L10 BASELINE DATA

The scale and level of detail in a SEA (particularly with regard to baseline information) is different to that of a project-level Environmental Impact Assessment (EIA), principally due to its position in the decision making hierarchy. As a SMP is a high level plan, this SEA considers the key features and characteristics of the study area that would influence decisions at a strategic level. As such, it is less detailed and quantitative than an EIA and is focused on broad directions of change. We have based this SEA on environmental data collected from our own records and through liaison with other bodies including Natural England, the Environment Agency and others.

The Theme Review (Royal Haskoning, 2008b) and Cross-section diagrams (Royal Haskoning, 2008a), which have been produced as part of the SMP process have been a key source of information in providing the basis and focus of the baseline provided below and in shaping the consideration of environmental issues. The SMP process requires a detailed assessment of the key features of the coastline, and the Theme Review and Site Characterisation reports provide an extensive tabulated and narrative based account of this. Accordingly the Theme Review and Site Characterisation reports should be considered by extension a critical element of the SEA process.

During the consultation process on the Scoping Report, any additional information relevant to this assessment will be collected (i.e. information not covered in the work described above). The forthcoming section describes the key features and legislation considered within the assessment, with the main subject areas for data collection being presented below:

- Pertinent policy relating to the Essex Coast;
- Legislation relating to the management of the Essex coast;
- Designations for environmental reasons relating to the Essex coastal area; and
- Wider environmental issues which are considered central to a consideration of SMP policy.

Baseline data has been provided in the following sections, based upon the themes which have emerging in the course of SMP production to date (Theme Review and Site Characterisation) and the receptors identified in the SEA Guidance (ODPM, 2006). The collation of data in this manner is representative of the issues identified within the SEA area and aids understanding of the relationship between receptors. For each heading, the relevant receptors have been identified from the list of receptors provided in Defra guidance (Defra, 2004) and specified in **Section 5.**

L10.1 Air Quality

It is considered that given the nature of SMP policy, air quality is not a receptor of the effects of the plan, and air quality has therefore not been considered further in this assessment. No pathway has been established between SMP policy and air quality. Construction which may be required to implement policy will be subject to a range of environmental assessment procedures, where direct affects will be addressed. Accordingly baseline data has not been provided for air quality.

L10.2 Climatic impacts

In a manner analogous to air quality, no tenable pathways were established between the SMP and climatic impacts, due to the high level and aspirational nature of the SMP. Again, where construction may be required to implement SMP policy, this will be subject to a range of environmental assessment procedures, where the direct affects will be addressed and therefore baseline data has not been provided for climatic impacts, with this receptor not being considered further.

L10.3 Water

L10.3.1 Designated shellfish waters 2004

As described in further detail in **Appendix B**, certain waters are designated under the Shellfish Waters Directive (2006/113/EC). The areas designated as such are intended to support the directive by protecting or improving shellfish waters in order to support shellfish life and growth, therefore contributing to the high quality of shellfish products directly edible by man. Within the SMP area designated shellfish waters are presented below:

- Walton Backwaters;
- Osea Island;
- Blackwater;
- Strood Channel;
- Salcott Channel;
- Tollesbury Channel;
- Pyefleet;
- Colne;
- Dengie;
- Roach and Lower Crouch;
- Upper Crouch;
- Upper Roach;
- Foulness;
- Outer Thames; and
- Southend

L10.3.2 Hydrology & water resources

The geology of coastal Essex is a complex array of varying marine, alluvial and glacial drift sediments that overly or border the thick deposits of the London Clay and terrace gravels. The characteristic fringing marshlands protected by sea walls were traditionally grazing marsh, composed of varied marine sediments lying at the seaward foot of the low clay hills or terrace gravels. The river catchments within the Essex CAMS comprise of the Rivers Orwell, Stour, Colne, Chelmer, Blackwater, Crouch and Roach.

L10.3.3 Borehole and water abstraction

Two groundwater protection zones lie within the SMP area, these being along the River Orwell around Ipswich and along the River Stour to the west of Manningtree. **Figure 2.1** presents groundwater protection areas within the wider Essex area (Environment Agency, 2008).

As can be seen from **Figure 2.1**, these groundwater protection zones are limited in extent and therefore SMP policy is unlikely to have a significant impact upon these areas. Licensed abstraction information for the Essex coastline is presented in **Figures 2.2 – 2.5**. There are numerous abstraction points in the flood zone along the coast, however the critical factor is there their specific location (i.e. providing access to water) does not need to be restricted to a coastal location. In simple terms, abstraction points could be moved to more landward locations (if required by coastal policy or processes) without any risk to interruption of the water supply.

Figure 2.1 **Groundwater sources protection zones within the wider Essex area (Environment Agency, 2008)**

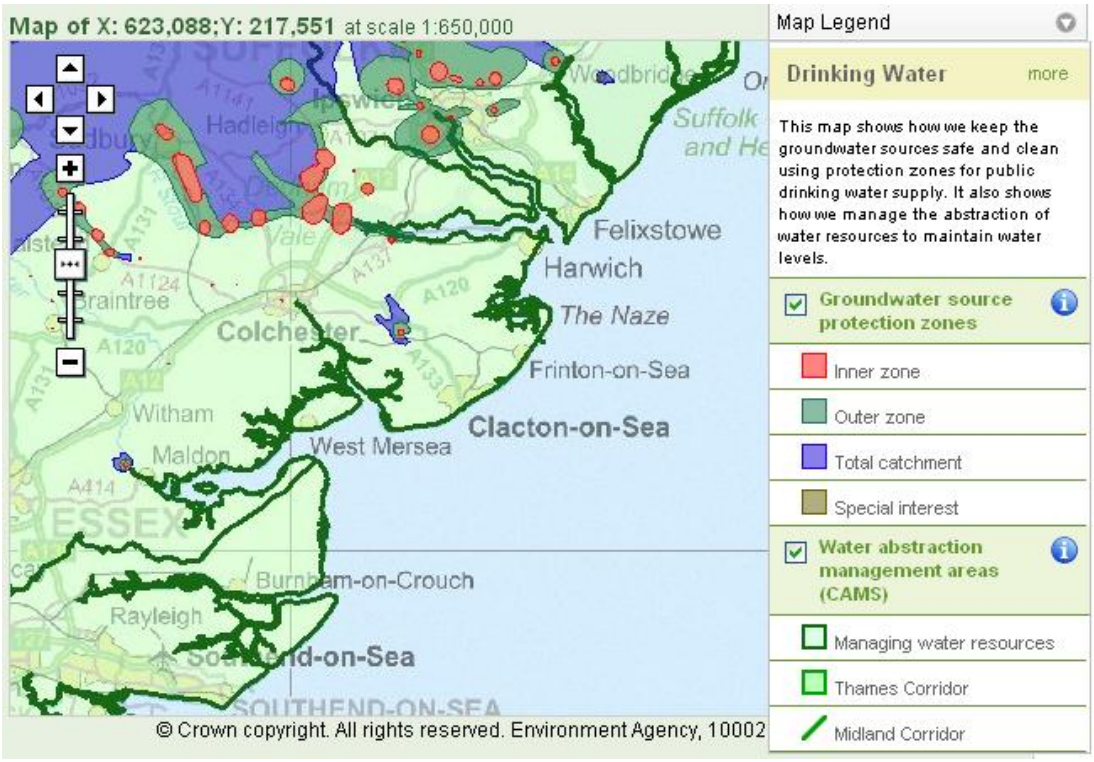


Figure 2.2 **Licensed Abstraction locations of the Essex coastline (Section 1)**

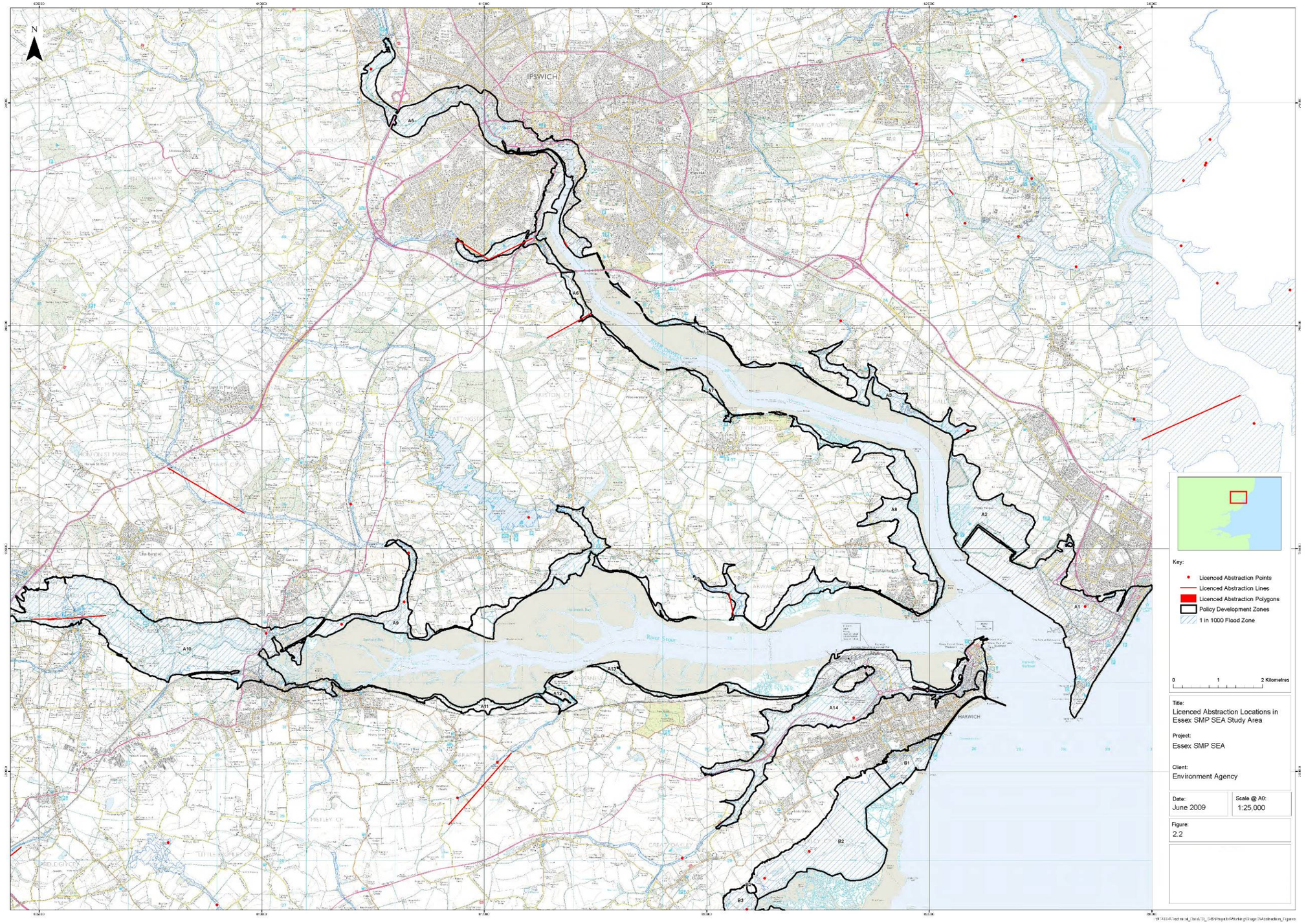


Figure 2.3 **Licensed Abstraction locations of the Essex coastline (Section 2)**

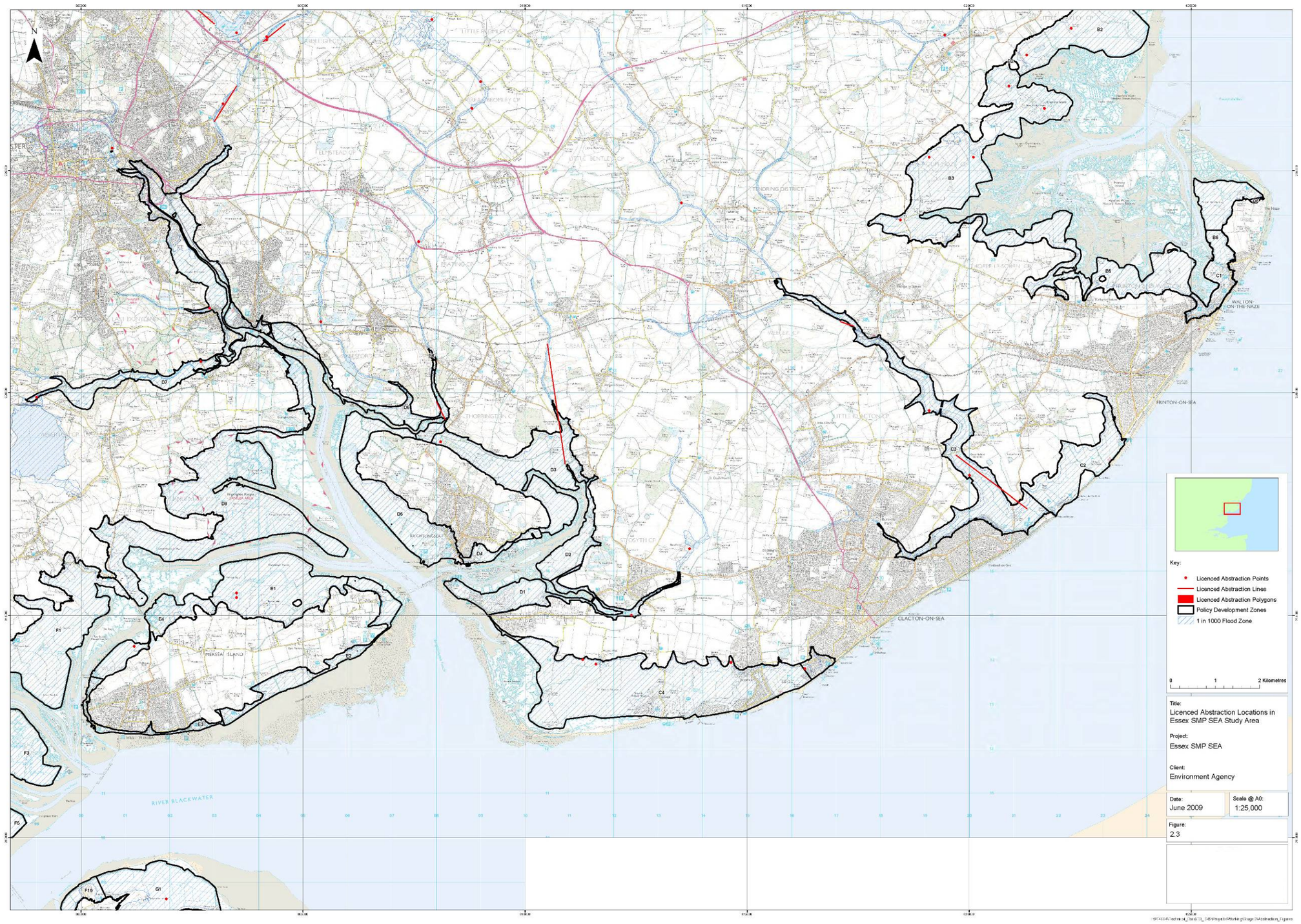
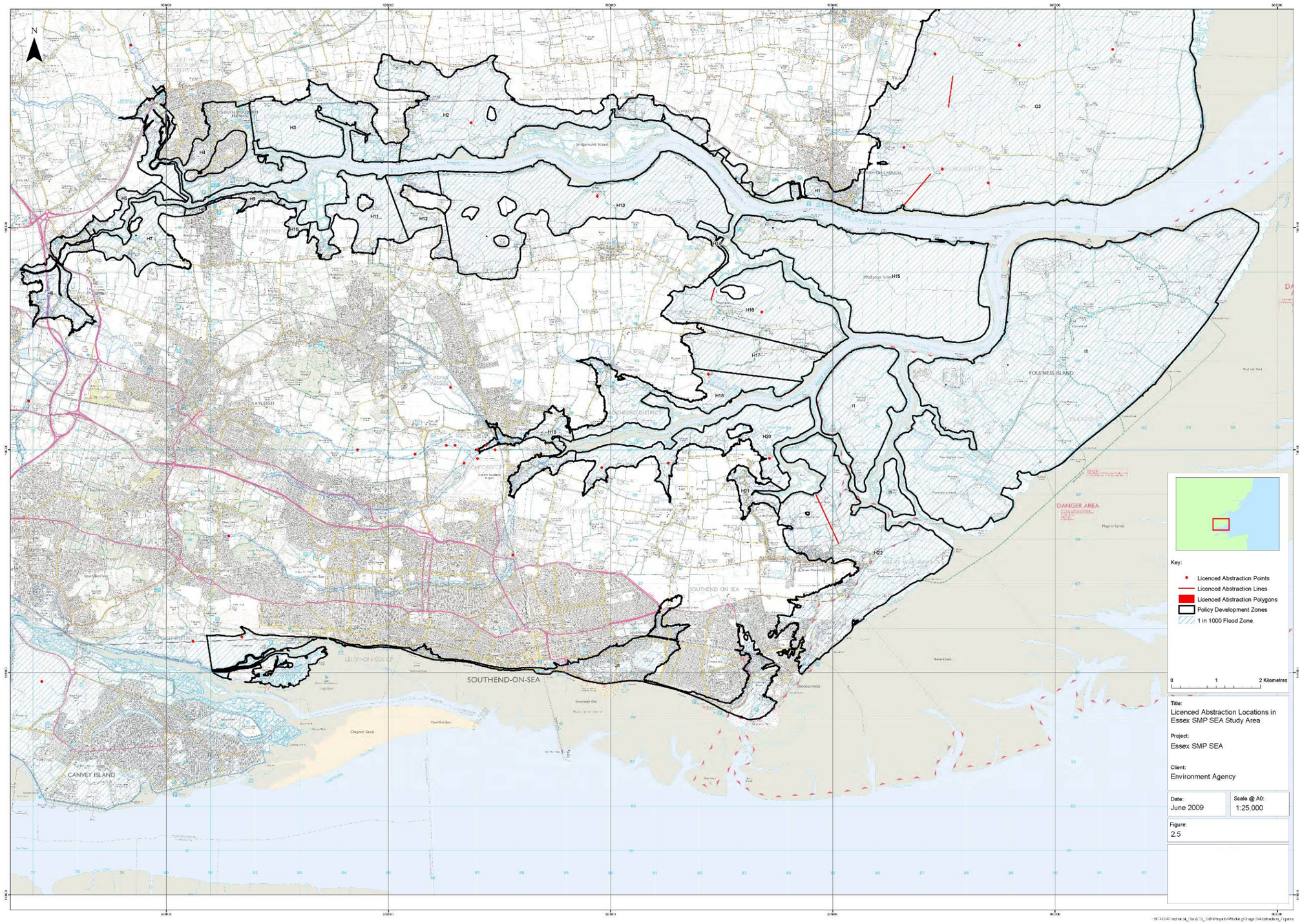


Figure 2.4 **Licensed Abstraction locations of the Essex coastline (Section 3)**

Figure 2.5 **Licensed Abstraction locations of the Essex coastline (Section 4)**



L10.4 Landscape

L10.4.1 Landscape Character Assessment

Essex has one of the longest coastlines of any county in England comprising complex estuary systems, extensive salt marsh and intertidal areas of international conservation importance. It still has a small but active fishing fleet and, largely due to its proximity to London, has been a traditional holiday area for over a century (Essex County Council, 2005).

Large scale reclamation has taken place over the recent past, with large areas of grazing marsh being at or below sea level. Overall the coastline is predominantly low lying and protected by earth clay flood embankments with sea facing revetment works or sea walls together with groynes. Essex has an unusual coastline, which is formed of a series of interlinked estuaries, these being the Stour and Orwell, Hamford Water, Colne and Blackwater, the Crouch / Roach and the Thames. These estuary systems are interrupted by discrete units of open coast - Walton to Colne Point, the Dengie Peninsula and the Maplin / Foulness shore. Much of the estuarine areas are dominated by muddy intertidal flats and saltmarshes, whereas in areas of open coast there is a mixture of features including London Clay sea cliffs and shingle, sandy and muddy beaches.

In places the junction between the coastal marshlands and the low hills is perceived as a gradual transition, such as the marshland at St Osyth and southeast of Maldon. Elsewhere, as at Fingringhoe, above the Mersea Flats at Cudmore Grove and above St Lawrence Bay, the land rises more steeply to around 20m AOD, to give a distinct backdrop to the horizontal planes of the coastal marsh (Essex County Council, 2005). This topographical difference is most striking at Creeksea, where the higher land comes to the river's edge as low cliffs, and behind Bridgemarsh Island where the land rises steeply to 50m.

The undeveloped coast of Essex exhibits a strong relationship between its ecology and landscape, perhaps more than anywhere else in the county (Essex County Council, 2005). More than any other attribute apart from landform, the ecology of the coastland gives it a unique and distinctive quality. The Landscape Character Assessment of the Essex coast (Essex County Council, 2005) provides the following list of features characteristic of the Essex coastline:

- A dynamic system of muds, sands, shingle and shells between the tides;
- Rich habitat for invertebrates and molluscs;
- Extensive feeding grounds for wildfowl and waders; basking areas for seals;
- Archaeological and historic remains;
- A large-scale open landscape with extensive views of estuary and coast;
- Big skies giving keen sense of the weather; and
- A sense of remoteness.

The Landscape Character Assessment of the Essex coast (Essex County Council, 2005) also provides the following list of key issues in regards to the Essex coastline:

- Danger of pollution of intertidal habitat;
- Disturbance of habitat by inappropriate recreation;

- Loss of traditional commercial maritime trade and distinctive sailing craft;
- Erosion of diversity and distinctiveness of seaside beach huts;
- Need for recording or conservation of archaeological and historic features;
- Restricted access;
- Views inland cluttered by scattered development; and
- Night-time remoteness damaged by lighting at urban fringes.

L10.4.2 Area of Outstanding Natural Beauty (AONB)

There are two Areas of Outstanding Natural Beauty in the study area:

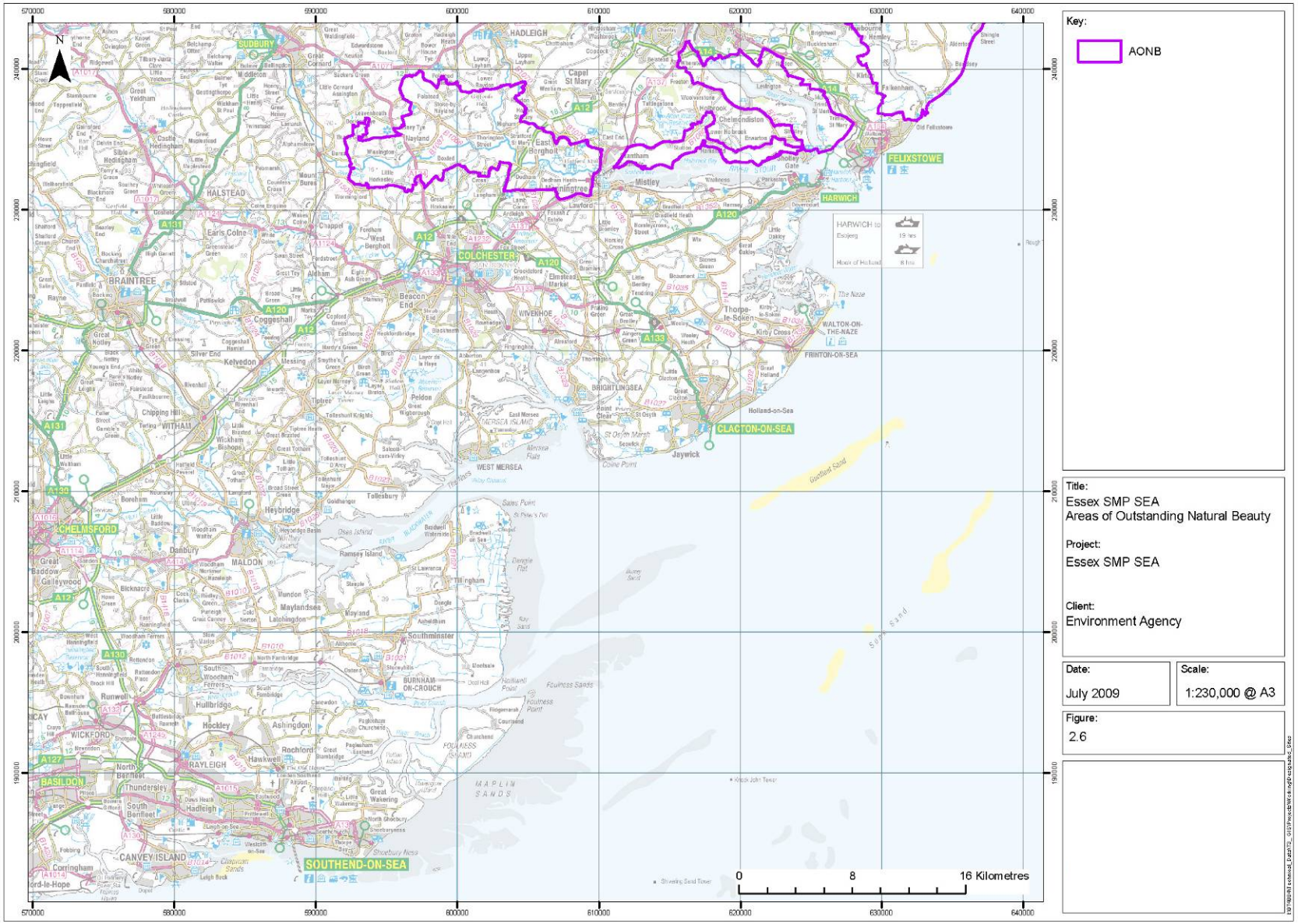
- Dedham Vale; and
- Suffolk Coasts and Heaths

Dedham Vale, on the Suffolk-Essex border is an exceptional example of a lowland river valley. Undulating slopes fall gently to the slow-flowing, meandering River Stour and in its hedged water meadows, copses and riverbank willows, the landscape has been described as the epitome of the farmed English countryside. The designated area of the AONB stretches upstream from Manningtree to within one mile of Bures. However, the landscape quality of the remainder of the Stour Valley has resulted in its designation as a potential AONB or Special Landscape Area and countryside management takes place within this wider framework.

The landscape was famously captured by John Constable over 200 years ago and is in part due to a desire to maintain the landscapes he painted and wrote about that led to the creation of the AONB. It was designated as an AONB in 1970 and covers approximately 90km^2. The Dedham Vale AONB and Stour Valley Management Strategy sets out the management actions to be taken by the relevant local authorities and organisations between 2004 and 2009, as well as containing a “vision up to 2030” (Dedham Vale AONB, 2004-2009).

The Suffolk Coast and Heaths AONB covers an area of 405km^2 and like Dedham Vale, was designated in 1970. It runs from Kessingland in the north to just south of the River Stour near Manningtree, and includes the towns of Southwold and Aldeburgh, Orford Ness and Rendlesham Forest. The Suffolk Coast and Heaths AONB Management Plan seeks to co-ordinate the action of the organisations that make up the AONB Partnership, while setting a framework for any organisation or individual whose activities will have an impact on the objectives for the area. In addition, the Management Plan also has a role in supporting the Local Development Frameworks (LDFs) of the local authorities, identifying issues, aims, objectives and actions that are relevant to the AONB and that can be underpinned by planning policy. Both management plans have been used within this assessment to provide direction for the development of SEA criteria (Suffolk Coasts and Heaths AONB, 2009). The AONBs within the study area of the Essex Coastline are shown in **Figure 2.6**.

Figure 2.6 Areas of Outstanding Natural Beauty on the Essex coastline



L10.5 The historic environment

From the end of the last glaciation, a combination of rising sea levels and subsidence of the North Sea basin led to submergence of former coastal lowlands. Rising and falling sea levels from 10,000 years ago led to the inundation of previously occupied sites by estuarine sediments, thus protecting the sites from further weathering. Archaeological surveys of the area have revealed some of the best quality, and most extensive, evidence of prehistoric settlements in England. In particular there are extensive areas of Neolithic land surface preserved within the intertidal zone.

Land use has historically been agricultural with archaeological evidence indicating that the production of wool and dairy produce was common from the Bronze Age. In the later Iron Age and Roman periods extensive salt production resulted in the creation numerous 'Red Hills' low mounds on the marshes composed of the debris from salt manufacture. These mounds were reused for hundreds of years as the location of camp sites for shepherds and dry areas for stock compounds.

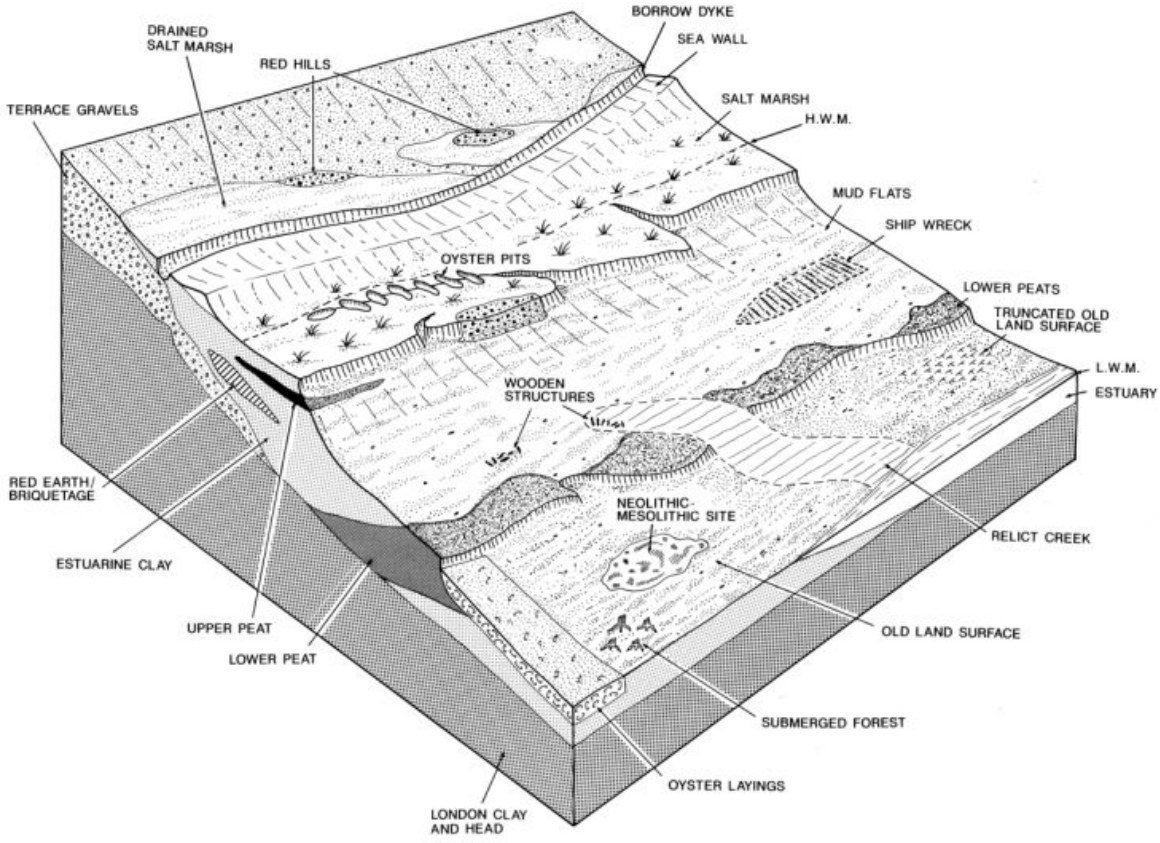


***Plate 1**. An example cross section of the Essex and south Suffolk coast showing the underlying geology and archaeological features that are found along this section of coastline.*

Settlement was historically largely sited on the higher ground, close to the interface with the marsh, in order to maximise access to resources, with some farms, fishing villages and small ports being established within the marshland itself. The Essex and south

Suffolk coast was a centre of oyster production in the Roman period. In the Saxon period very large timber fish-traps, whose remains can be seen at low tide at many locations, were constructed at a time when urban ports first develop, most notably at Ipswich at the head of the Orwell. Throughout later prehistory - the Roman and Saxon periods - the marshes were used for grazing. This was on the open saltmarsh; it was not until the medieval period that they began to be enclosed by sea walls and converted to managed grazing marshes, a process that continued for centuries. Thus by the late 18th century almost the whole of the coastline was fringed by embanked and managed grazing marsh. Grazing was the dominant farming pattern for centuries although areas were used at times for arable agriculture. Fishing, hunting wildfowl and the harvesting of shellfish have also been practiced for centuries. It has been estimated that in the region of 80% of the coastal grazing marsh has been lost since the end of the Second World War, some of which is being restored through agri-environment schemes.

Almost every village and farm in the coastal region was connected to the creeks and estuaries; many were provided with their own wharfs or landing stages. In a 16th century survey of 'all the Ports Creeks and Landing Places in England and Wales' Essex was recorded as having 135 compared with 29 in Sussex, 18 in Kent, 17 in Suffolk and 12 in Norfolk. The proximity of this coast to the European mainland has resulted in a wide range of fortifications, defences and military infrastructure being built, from Roman times to the Cold War.

In Essex there are over 300 Scheduled Monuments (SMs), of which 27 are cited by English Heritage as being at risk. Although protected by law, scheduled monuments are threatened by a wide range of human activities and natural processes. SMs within the study area are presented in **Table 2.1**. It must be recognised that this represents only a tiny fraction of the archaeological sites and deposits present, and by no means all that are most significant. In recognition of the significance and complexity of the historic environment of the Essex coast; the whole of the Blackwater estuary, and upper Crouch estuary, have recently been included on the English Heritage list of nationally significant sites as part of its *Heritage Management of England's Wetlands initiative.*

Table 2.1 Scheduled Monuments within the 1 in 1000 year flood zone (MAGIC, 2008)

Name	Easting	Northing
Landguard Fort and associated field works	628452.613349	231782.541217
Area of middle and late Saxon town	616526.77499	244147.283559
Shotley Battery	625039.330501	233960.63118
Martello Tower 'L'	624830.055248	233655.768502
Ring Ditches south west of Reed Island	608621.520682	232704.46818
Napoleonic coastal battery at Bath Side, 400m west of Tower Hill	625873.712856	232441.358846
Harwich Lighthouse	626116.041222	232436.962
The Harwich Treadwheel Crane	626215.181816	232468.603682
The Dovercourt Lighthouses and causeway	625384.588263	230822.020861
Beaumont Quay, Hamford Water: 19th Century quay & lime kiln	618964.772389	224004.877658
Martello Tower 'K' and associated battery south west of Walton Mere	625078.16506	222007.128186
Martello Tower 'K' and associated battery south west of Walton Mere	625149.124419	222048.167563
Lion Point Decoy 810m SE of Cockett Wick Farm	613941.065847	213291.882531
Martello Tower 'C', St Osyth Beach, Clacton-on-Sea	613618.313692	212752.986822
Martello Tower 'A' & associated battery, Stone Point	608299.517748	215691.959609

Martello Tower 'A' & associated battery, Stone Point	608235.812851	215669.78953
Coastal Fish Weirs at West Mersea, 570m south of St Peter's Wall	600995.320932	211931.420825
Coastal Fish Weir at northern end of the Nass	599953.799625	211038.435533
Square Decoy Pond 260m south of Pennyhole Fleet, Old Hall Marshes	598661.893456	211804.663933
Decoy Pond immediately north of Pennyhole Fleet, Old Hall Marshes	598280.540836	212339.328615
Gore Decoy 760m south of East Lauriston Farm	592600.224062	208247.758999
Mound E of Basin Road	587165.93785	207514.433412
Coastal Fish Weir 440m North West of Pewet Island	598750.7171	208132.961674
Saxon Coastal Fish Weir	603354.586317	209376.442142
Saxon shore fort and Anglo-Saxon monastery, Bradwell-on-Sea	603117.033578	208188.311166
Decoy Pond 700m north of Marsh Farm House	601942.573663	204201.393608
Medieval Saltern adjacent to Hawbush Creek	582338.011299	196297.468501
Romano-British burial site on Foulness Island	597910.18613	190520.399983

None of the SMs listed in **Table 2.1** are deemed to be at risk from coastal processes (English Heritage, 2009). Other historic environment features of interest are presented in **Figures 2.7** – **2.10**, with these figures showing the following features:

- Scheduled Monuments (SMs);
- Listed Buildings;
- Registered parks and gardens; and
- Battlefields

As highlighted by **Figures 2.7** – **2.10** this area does include a number of Listed buildings in areas that may be at risk through coastal processes. Such features are typically found in existing settlements, which are therefore likely to be protected (both historically and via SMP policy), however it is evident that along the entire coast, examples can be found of isolated Listed Buildings near to the foreshore. Clearly therefore, SMP policy evaluation will need to have regard to the effects on local Listed Buildings wherever a policy of managed realignment or no active intervention is considered.

In addition to the features listed above, the marshes of Essex and estuarine areas are considered to contain a variety of non-designated historical features. Such features may currently be unknown/undiscovered and may be at risk where the foreshore is expected or intended to move landward (through realignment or erosion). The typical approach to this issue in the SMP process is to include English Heritage in the process of evaluating areas that may be lost, so that a process of investigation and evaluation is provided (with adequate time and resources).

L10.5.1 Conservation areas

Conservation areas vary greatly in their nature and character, ranging from the centres of our historic towns and cities, through fishing and mining villages, eighteenth and nineteenth century suburbs, model housing estates, and country houses set in their historic parks, to historic transport links and their environs, such as stretches of canal.

Conservation areas give broader protection than listing individual buildings: all the features listed or otherwise, within the area, are recognised as part of its character.

Local authorities have the power to designate as conservation areas in any area of

'special architectural or historic interest' whose character or appearance is worth protecting or enhancing. This 'specialness' is judged against local and regional criteria, rather than national importance as is the case with listing. Conservation areas within the SMP areas are presented in **Table 2.2**.

Table 2.2 **Conservation areas along the Essex coast and lying wholly or partially within the 1 in 1000 flood zone**.

District Council	Conservation area
Tendring District Council (10 in total)	Brightlingsea
	Brightlingsea Hall & All Saints Church
	Clacton Sea Front
	Frinton
	Harwich
	Manningtree & Mistley
	Thorpe-le-Soken Station & Maltings
Maldon District Council (10 in total)	Burnham on Crouch
	Goldhangar
	Heybridge basin
	Langford
Colchester District Council	Wivenhoe
Rochford District Council (10 in total)	Foulness Churchend
	Great Wakering
	Paglesham East End
	Paglesham Church End
	Rochford
Southend Borough Council	Leigh Old Town
	Seafront
	Shoebury Garrison

Further background information on the Essex coastline which has been used in this assessment is provided as **Appendix D.**

Figure 2.7 **Historic environment map of the Essex coastline (Section 1)**

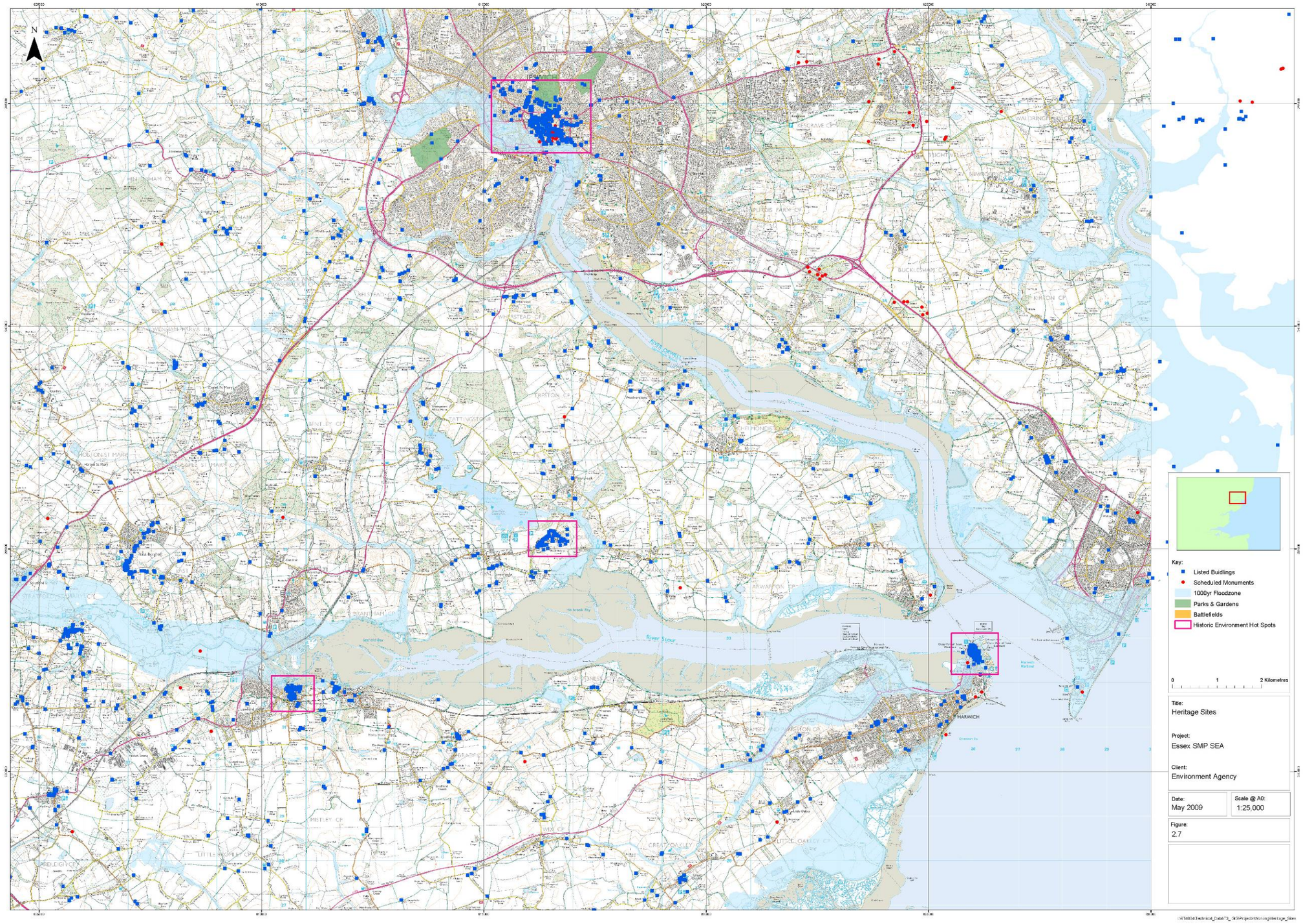


Figure 2.8 **Historic environment map of the Essex coastline (Section 2)**

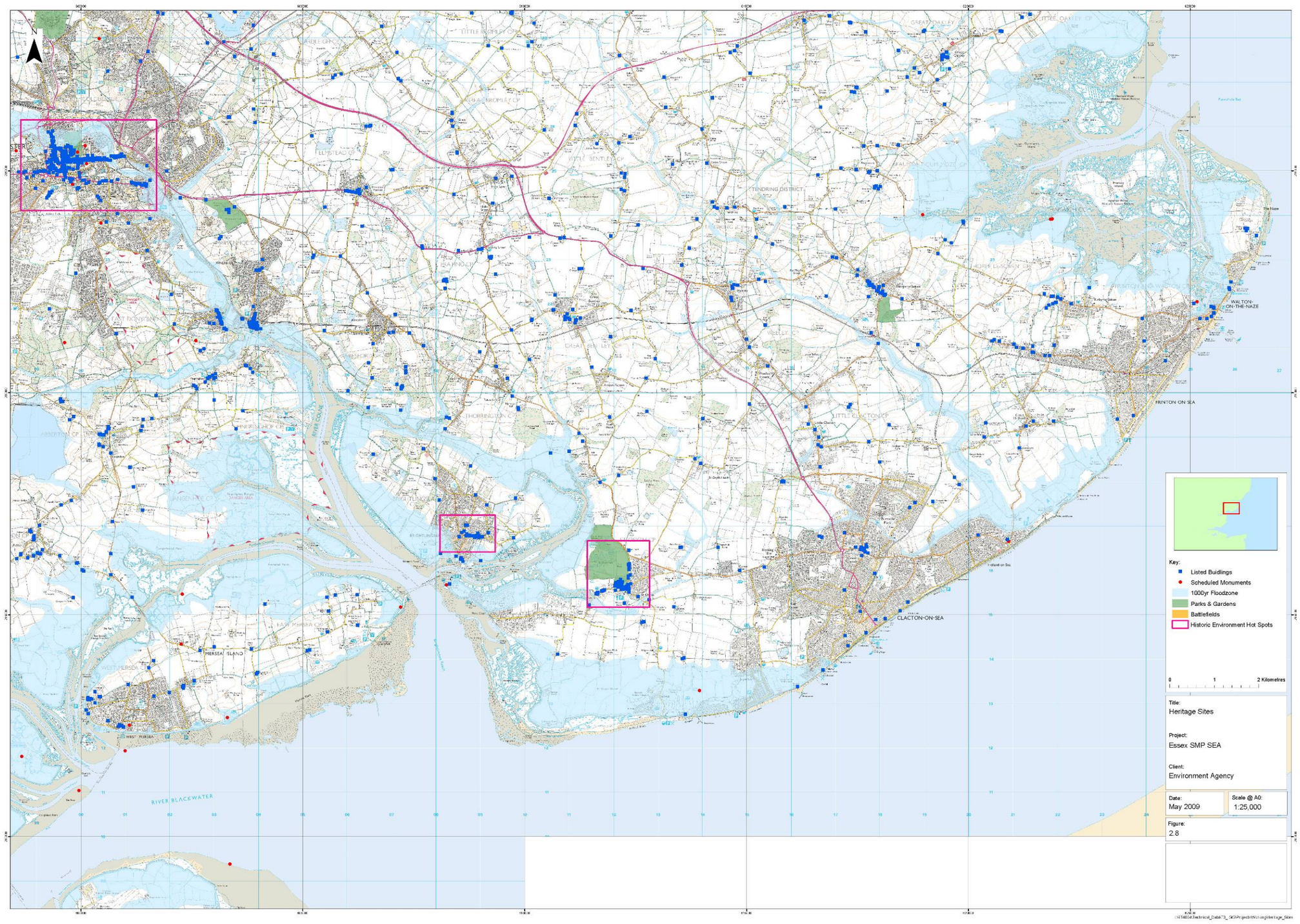


Figure 2.9 **Historic environment map of the Essex coastline (Section 3)**

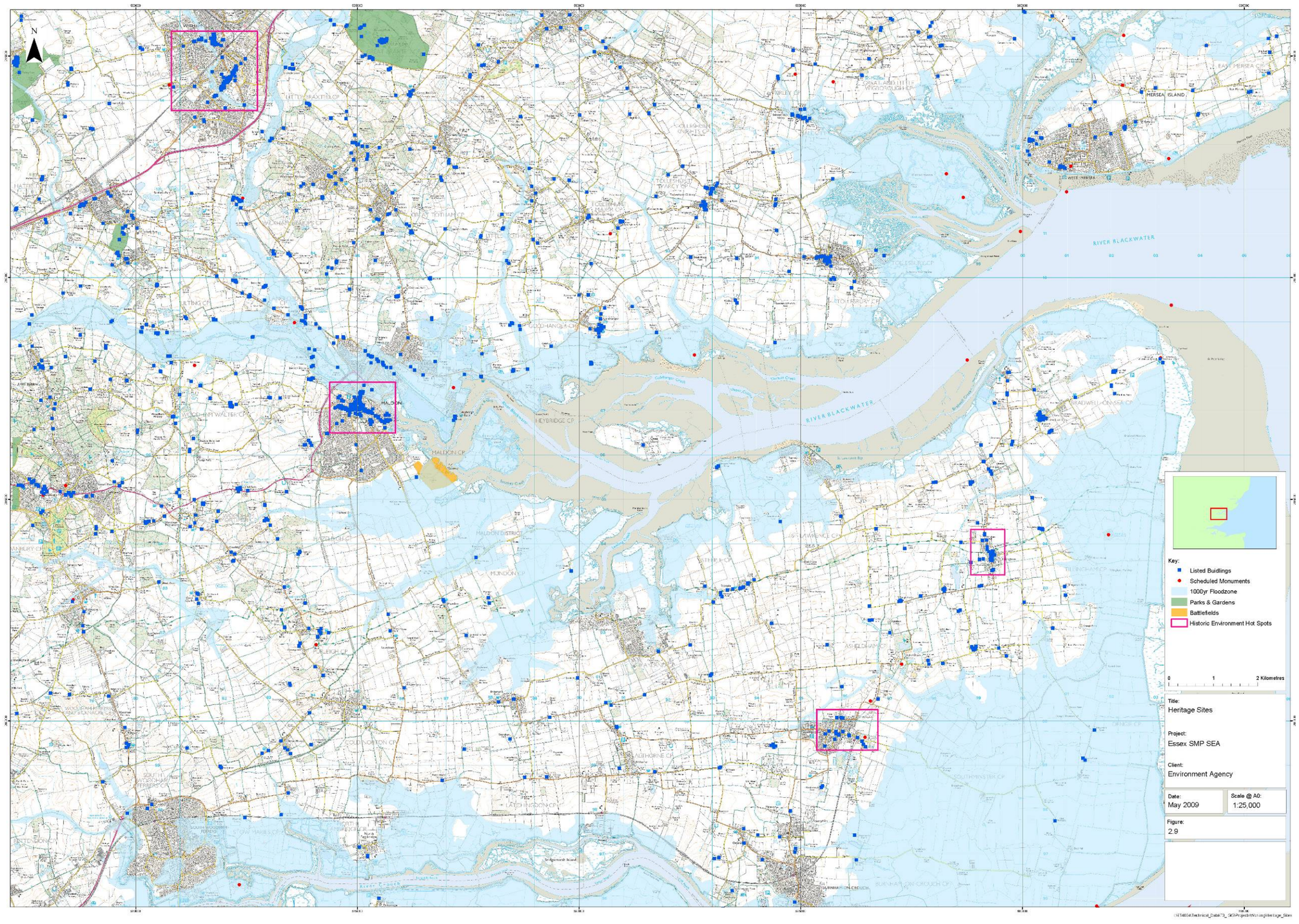
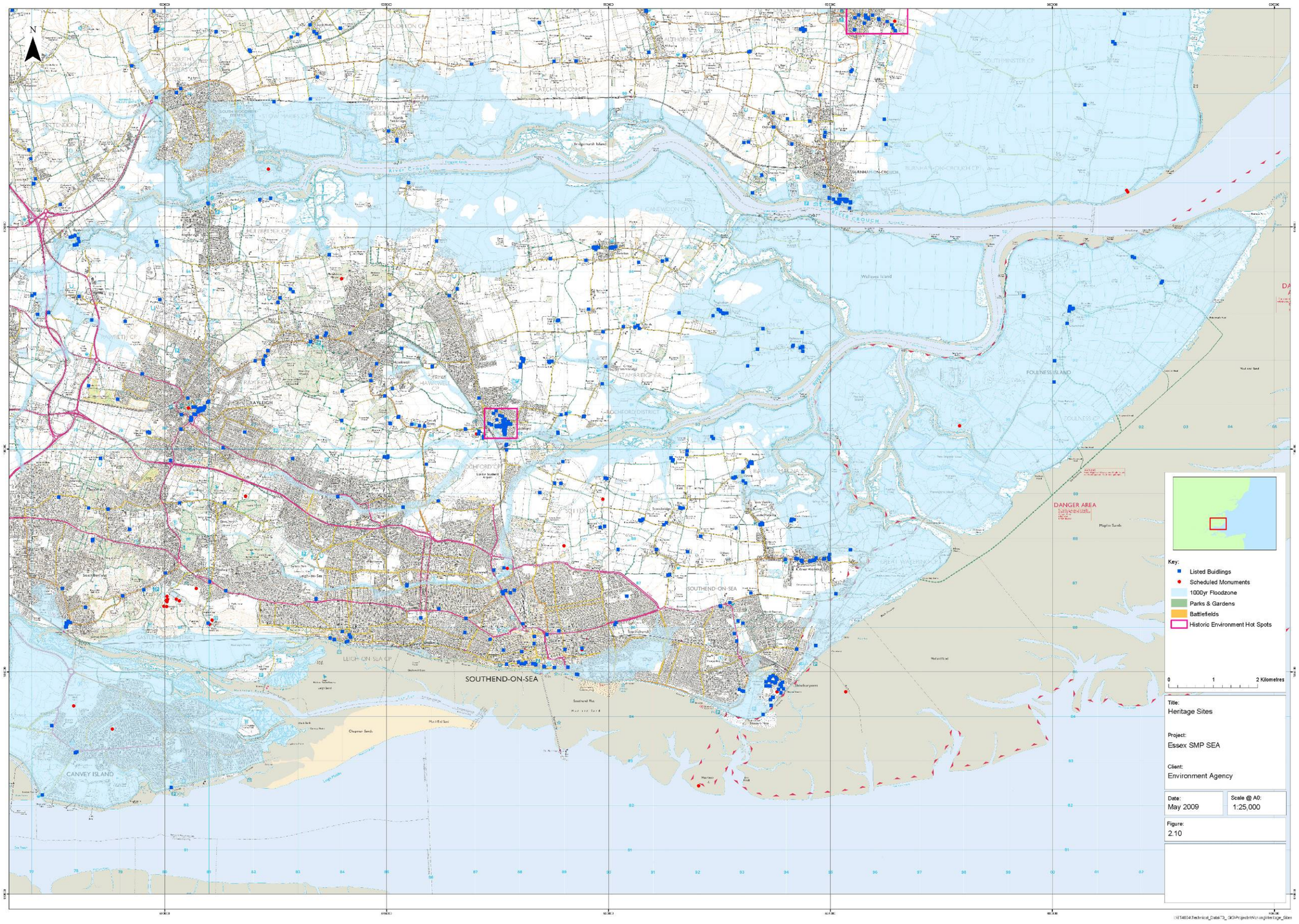


Figure 2.10 **Historic environment map of the Essex coastline (Section 4)**



L10.6 Habitats & species

L10.6.1 Statutory International Designations

The largely undeveloped Essex coast is home to a wide range of species and habitats and is of particularly high conservation value. It is also a vulnerable coastline. Sections of coastline are suffering from 'coastal squeeze' where the intertidal zone is trapped between the coastal defence (flood bank or sea wall) and rising sea levels. As a result many of the salt-marshes are in decline, exposing the defences to increased wave attack and causing concern for engineers and environmentalists alike. Each of these habitats in turn supports a range of species of high conservation value, including birds, plants and invertebrates. The high conservation value is reflected in the fact that the majority of the coastline is subject to statutory nature conservation and landscape designations. These designations have important implications for any prospective developments, management or policies relating to the Essex Coast.

Broadly speaking, nature conservation designations seek to conserve designated areas and the habitats and species which are the basis of their statutory designations. However, different designations are derived from different pieces of legislation, which each vary in the nature and mechanisms of their protection. The statutory designations which apply to the Essex Coast SMP2 area, their implications and requirements, are detailed in the forthcoming section. Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites are covered by the provisions of the Conservation Regulations 1994 (the Habitat Regulations). This entails stringent requirements that 'plans or projects' not directly connected with or necessary for the management of the (SAC, SPA or Ramsar) site, can only proceed where it can be demonstrated by the competent authority for consenting the plan or project that it will not adversely affect the integrity of the site. Shoreline Management Plans come under the definition of 'plan or project', and must therefore pass this test, via an 'appropriate assessment'.

The inherently dynamic nature of coastal environments, and the potential of flood risk management structures and practices to both constrain (e.g. by holding or advancing the line) and create (e.g. from no active intervention or managed realignment) habitat means that SMP policy has a highly significant bearing on natural habitats and designated sites. Where plans or projects (policies within the SMP in this context) can not be determined as having no adverse effect on site integrity, they may nonetheless proceed if no alternative solutions exist, and they are deemed necessary on the basis of having imperative reasons of over-riding public importance (IROPI). Where projects are allowed to proceed on this basis, compensatory measures must be secured to ensure that the overall coherence of the Natura network (SPAs and SACs) is maintained. In the context of coastal habitats, this might include the creation of new habitat on adjacent coastal areas by managed realignment.

All Internationally designated sites within the study area (either coastal or within the 1 in 1000[§] year coastal flood zone) are presented in **Table 2.3**.

[§] The 1 in 1000 year flood zone indicates that any land within this zone has a 0.1% probability of tidal inundation per annum.

Table 2.3 Internationally designated sites within or adjacent to the study area

International site type	Legislation site designated under	Site name	Area (ha)
Ramsar	Ramsar Convention	Stour & Orwell Estuaries	3,672.64
		Hamford Water	2,185.76
		Colne Estuary	2,713.99
		Crouch & Roach Estuaries	1,745.11
		Blackwater Estuary	4,395.15
		Dengie	3,134.01
		Benfleet & Southend Marshes	2,283.96
		Foulness	10,942.13
		Abberton Reservoir	726.2
Special Area of Conservation (SAC)	Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive)	Essex Estuaries	46,109.95
Special Protection Area (SPA)	Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive)	Stour & Orwell Estuaries	3,672.64
		Hamford Water	2,185.76
		Colne Estuary	2,719.93
		Blackwater Estuary	4,403.40
		Dengie	3,134.01
		Benfleet & Southend Marshes	2,283.96
		Foulness	10,942.13
		Abberton Reservoir	726.2

The Stour Estuary forms the south-eastern part of Essex/Suffolk boundary. The Orwell Estuary is a relatively long and narrow estuary with extensive mudflats and some saltmarsh, running from Ipswich in the north, southwards towards Felixstowe (JNCC, 2008a). The Stour and Orwell Estuary is a wetland of international importance, comprising extensive mudflats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. It provides habitats for an important assemblage of wetland birds in the non-breeding season and supports internationally important numbers of wintering and passage wildfowl and waders. The area also forms an important habitat for seven nationally scarce plants and five British Red Data Book invertebrates (JNCC, 2008a).

Hamford Water is a large, shallow estuarine basin comprising tidal creeks and islands, intertidal mud and sand flats, and saltmarsh supporting rare plants and internationally important species and populations of migratory waterfowl (JNCC, 2008b).

The Colne Estuary lies about 3 km south-east of Colchester on the north Essex coast (JNCC, 2008c). The Colne Estuary is a comparatively short and branching estuary, with five tidal arms which flow into the main river channel. The estuary has a narrow intertidal zone predominantly composed of flats of fine silt with mudflat communities typical of south-eastern estuaries. It is a site of international importance for wintering Brent geese *Branta bernicla bernicla* and black-tailed godwit *Limosa limosa*, as well as being of

national importance for breeding little tern *Sterna albrifrons* and five other species of wintering waders and wildfowl. The variety of habitats which include mudflat, saltmarsh, grazing marsh, sand and shingle spits, disused gravel pits and reedbeds, support outstanding assemblages of invertebrates and plants (JNCC, 2008c).

Abberton Reservoir is a large, shallow, freshwater storage reservoir built in a long, shallow valley and is the largest freshwater body in Essex. It is one of the most important reservoirs in Britain for wintering wildfowl and waders feeding in adjacent estuarine areas. The site is also important for winter feeding and autumn moulting of waterbirds. The margins of parts of the reservoir have well-developed plant communities that provide important opportunities for feeding, nesting and shelter. Abberton Reservoir is also important especially as an autumn arrival area for waterbirds that subsequently spend the winter elsewhere (JNCC, 2008d).

The Blackwater Estuary is the largest estuary in Essex north of the Thames and is one of the largest estuarine complexes in East Anglia. A large number of nationally and internationally important species are supported by the saltmarsh-fringed mudflats found along the Blackwater. Of additional conservation interest are the surrounding terrestrial habitats including ancient grazing marsh with its associated fleet and ditch systems and semi-improved grassland. This rich mosaic of habitats supports an outstanding assemblage of nationally scarce plants and a nationally important assemblage of rare invertebrates. There are 16 British Red Data Book species and 94 notable and local species (JNCC, 2008e).

Dengie is a large and remote area of tidal mudflat and saltmarsh at the eastern end of the Dengie peninsula, between the Blackwater and Crouch Estuaries. The saltmarsh is the largest continuous example of its type in Essex. The foreshore, saltmarsh and beaches support an outstanding assemblage of rare coastal flora. The site hosts internationally and nationally important wintering populations of wildfowl and waders, and in summer supports a range of breeding coastal birds including knot *Calidris canuta*, hen harrier *Circus cyaneus* and brent goose. The formation of cockleshell spits and beaches is of geomorphological interest (JNCC, 2008f).

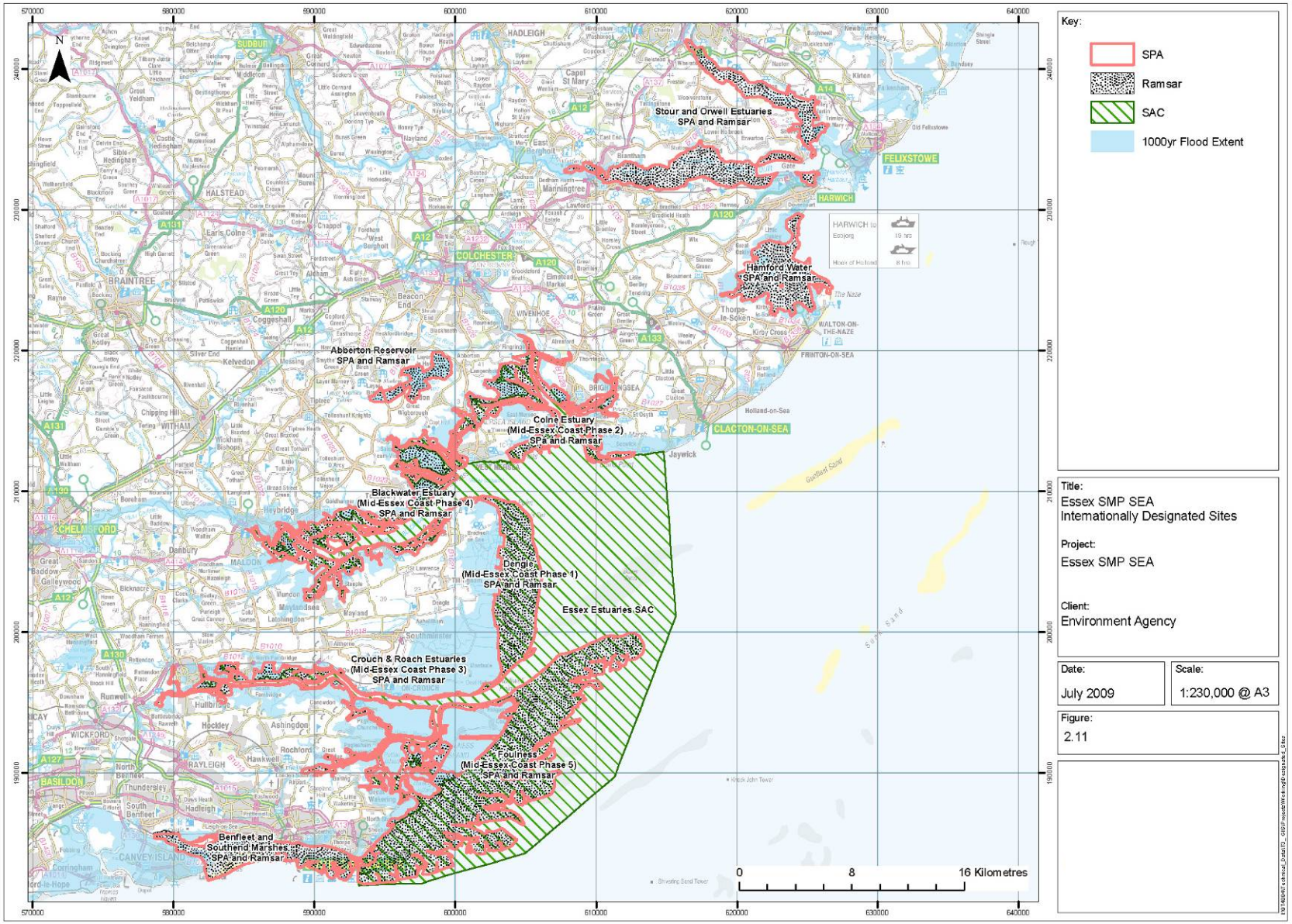
The River Crouch and the River Roach are between the Dengie Peninsula and Southend-on-Sea (JNCC, 2008g). The River Crouch occupies a shallow valley between two ridges of London Clay, whilst the River Roach is set predominantly between areas of brick earth and loams with patches of sand and gravel. The intertidal zone along the Rivers Crouch and Roach is 'squeezed' between the sea walls of both banks and the river channel. This leaves a relatively narrow strip of tidal mud that provides important habitat for a significant numbers of birds. The site is an internationally important location for the hen harrier and brent goose. Additional interest is provided by the aquatic and terrestrial invertebrates and by an outstanding assemblage of nationally scarce plants (JNCC, 2008g).

Foulness is part of an open coast estuarine system at the wide northern mouth of the Thames estuary comprising grazing marsh, saltmarsh, intertidal mudflats and sandflats. The site includes one of the three largest continuous sand-silt flats in the UK. These habitats support nationally rare and nationally scarce plants, and nationally and internationally important populations of breeding, migratory and wintering waterfowl (JNCC, 2008h).

Benfleet and Southend Marshes comprise an area of foreshore with a tidal creek system and an area of grazing marsh. The marshes form an important internationally designated habitat for species including the brent goose, knot and ringed plover *Charadrius hiaticula*. The south-facing slopes of the downs of composed of London Clay capped by sand, and represent the line of former river cliffs with several re-entrant valleys.

The effect of the designations listed in **Table 2.2** is that large areas of the Essex coastline are covered by one designation or more. **Tables 1** – **19** in **Appendix C** present the qualifying features for all statutory internationally designated sites within the Essex SMP area. **Figure 2.11** presents an overview of the designated conservation areas along the Essex coastline.

Figure 2.11 Internationally designated sites along the Essex coast SMP SEA study area



L10.6.2 Statutory National Designations

The Essex coastline also contains several sites designated under national legislation, with these being presented in **Tables 2.4** – **2.5** and **Figure 2.12** with qualifying information for these sites being presented in **Table 2.6**.

Table 2.4 Sites designated SSSI under national conservation legislation on the Essex coast

SSSI name	Area (ha)
Landguard Common	30.49
Orwell Estuary	1335.52
Stour Estuary	2248.01
Cattawade Marshes	89.22
Stour & Cooperas Woods, Ramsey	78.17
Harwich Foreshore	10.32
Little Oakley deposit channel	2.95
Hamford Water	2185.76
The Naze	24.06
Holland Haven Marshes	210.63
Holland On Sea Cliff	0.09
Clacton Cliffs and Foreshore	26.28
Colne Estuary	2986.46
St Osyth Pit	0.06
Upper Colne Marshes	113.19
Blackwater Estuary	4403.46
Dengie	3132.43
Sandbeach Meadows	29.38
Foulness	10946.14
Crouch and Roach Estuaries	1745.98
Benfleet & Southend Marshes	2373.68

Table 2.5 Sites designated NNR under national conservation legislation on the Essex coast

NNR name	Area (ha)
Blackwater Estuary	1031
Colne Estuary	576
Dengie	2366
Hamford Water	1448
Leigh	257

Figure 2.12 Nationally designated sites within the Essex SMP SEA study area

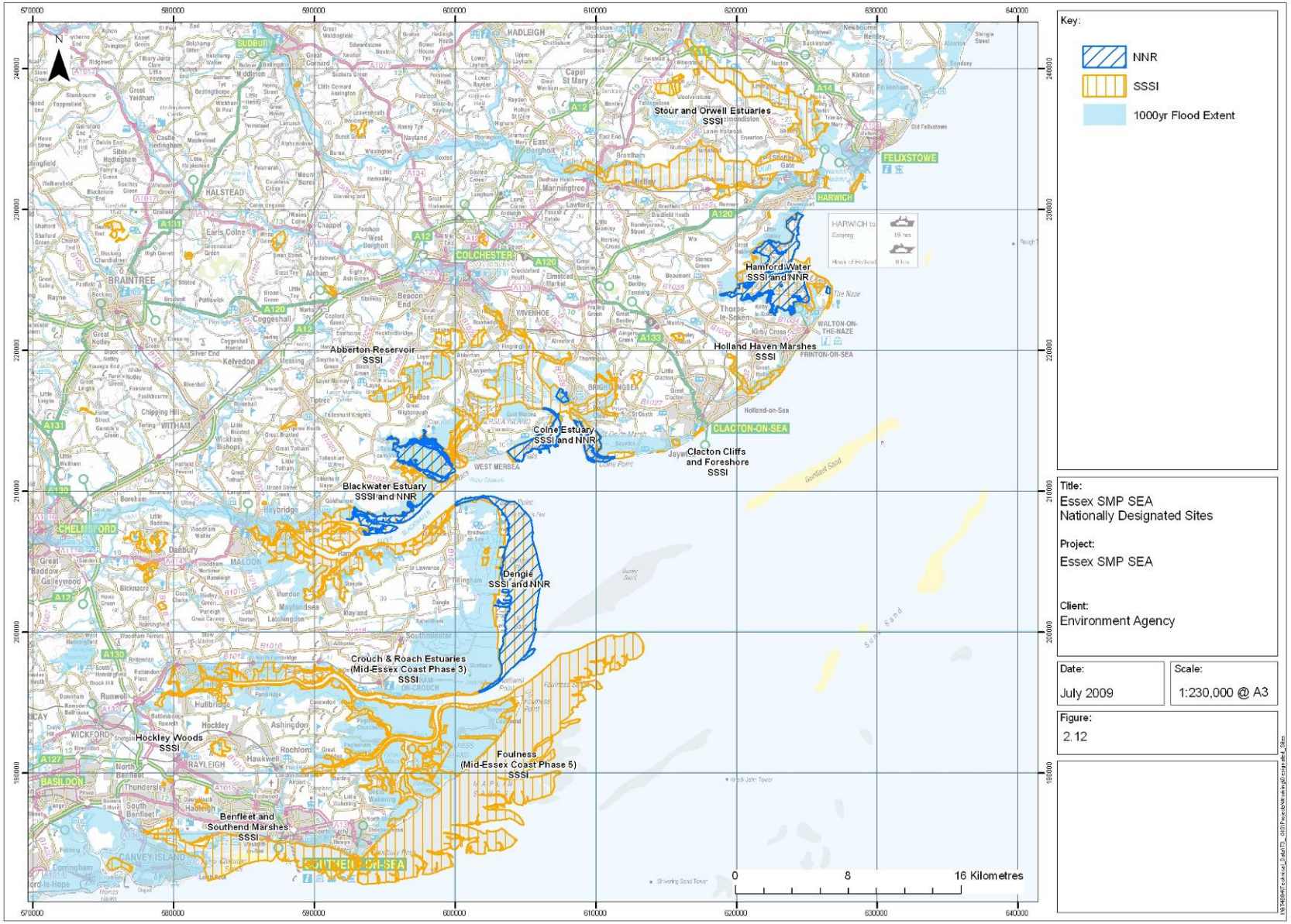


Table 2.6 Qualifying information for sites designated under national conservation legislation on the Essex coast

SSSI name	Site Features
Landguard Common	Landguard Common is a sand and shingle spit protecting the northern entrance to the haven ports of Harwich and Felixstowe. It consists of a loose shingle foreshore backed by a stabilized, vegetated beach, earth banks and scrub. Pioneer shingle plants and vegetated shingle beaches are fragile and nationally scarce habitat type. The site is also of some ornithological interest as a landfall site for passage migrants and for breeding shorebirds. The north part of the foreshore is protected by sea defences but this and the beach crest further south is sea washed and provides bare shingle for colonizing shingle species. This includes a large population of Sea Kale *Crambe maritima* as well as Sea Pea *Lathyrus japonicus*, Yellow-Horned Poppy, Sea Sandwort and Sea Campion. The bare shingle is also used by nesting Little Tern and Ringed Plover.
Orwell Estuary	The Orwell Estuary is of national importance for breeding avocet *Recurvirostra avosetta*, its breeding bird assemblage of open waters and their margins, nine species of wintering waterfowl (including black-tailed godwit *Limosa limosa islandica*), an assemblage of vascular plants and intertidal mud habitats.
Stour Estuary	The Stour Estuary is nationally important for 13 species of wintering waterfowl and three species on autumn passage. The estuary is also of national importance for coastal saltmarsh, sheltered muddy shores, two scarce marine invertebrates and a vascular scarce plant assemblage. The Stour Estuary includes three nationally important geological sites. These provide exposures of early Eocene sediments containing the volcanic ash formations between Harwich and Wrabness. The same rocks are also important for the fossil fruits and seeds that they contain. At Stutton, much younger Pleistocene sediments have yielded an important and rich fossil vertebrate fauna.
Cattawade Marshes	At the head of the Stour Estuary, between freshwater and tidal channels of the river Stour. These grazing marshes with associated open water and fen habitats are of major importance for the diversity of their breeding bird community, which includes species that have become uncommon throughout lowland Britain as a result of habitat loss. The site has benefited from a sympathetic management regime aimed at enhancing the ornithological interest. The marshes are also of value as a complement to the adjacent Stour Estuary SSSI where breeding habitats for birds are relatively scarce.
Stour & Cooperas Woods, Ramsey	Stour and Copperas Woods together comprise the largest area of woodland in north-east Essex. They are ancient woods lying on glacial sands and gravels on the southern shore of the Stour Estuary between Wrabness and Ramsey. They have a coppice-with standards structure and contain the only example in the county where coastal and woodland habitats meet. The woodland is mainly Chestnut *Castanea sativa* coppice with Pedunculate Sessile Oak *Quercus robur* and *Q. petraea* standards and some ash *Fraxinus excelsior*. Hornbeam *Carpinus betulus*, hazel *Corylus avellana* and small-leaved lime *Tilia cordata* form the other coppice species with maple *Acer campestre* on the woodland edge. The chestnut stools are exceptionally large. Holly *Ilex aquifolium* and butcher's broom *Ruscus aculeatus* occur near the margins. Copperas Wood, whose seaward boundary is an eroding wooded cliff, contains in addition an area of cherry *Prunus avium* and aspen *Populus tremula*. The ground flora of the woods is dominated by bramble *Rubus fruticosus agg*. with bluebell *Hyacinthoides non-scripta*, wood anemone *Anemone nemorosa* and honeysuckle *Lonicer periclymenum* widespread. There are large patches of yellow archangel *Lamiastrum galeobdolon* and dog's mercury *Mercurialis perennis* is found locally.
Harwich Foreshore	This locality yields the only fossil flora that is with certainty attributable to the lowest division of the Eocene London Clay. Its composition is typical of the formation and specimens are abundant. Association of the plants with ash bands within the Clay may aid correlations

SSSI name	Site Features
	elsewhere in the basin since they form useful marker horizons. It is a recently discovered site with great research potential.
Little Oakley Deposit Channel	Little Oakley Channel Deposit provides a reserve of Pleistocene interglacial channel-fill sediments, unique in Britain, and currently attributed to part of the Cromerian complex of interglacials recognized in the Netherlands. Excavations and borings at Little Oakley have yielded abundant faunal and floral remains, including numerous mammalian bones (many of extinct species), molluscs, ostracods, as well as a fine pollen record. The site is of great importance for Quaternary studies, not only because it seems to represent an early Middle Pleistocene interglacial unknown elsewhere in Britain, but also because it is associated with the early Thames drainage system, and therefore assists in the establishment of a link between the Pleistocene successions in the Thames Valley and East Anglia.
Hamford Water	Hamford Water is a tidal inlet whose mouth is about three miles south of Harwich. It is a large and shallow estuarine basin comprising tidal creeks, intertidal mud and sand flats, saltmarshes, islands, beaches and marsh grasslands. The site is of international importance for breeding Little Terns and wintering dark-bellied Brent Geese, wildfowl and waders, and of national importance for many other bird species. It also supports communities of coastal plants which are rare or extremely local in Britain, including Hog's Fennel *Peucedanum officinale* which is found elsewhere only in Kent.
The Naze	The main interest of this site is in the excellent cliff exposures of the earliest (Waltonian) sub-division of the Pleistocene Red Crag, which is here rich in marine Mollusca and other invertebrate fossils. This overlies older Tertiary sediment. This is the type of site for the earliest recognised stage of the British Pleistocene sequence, the Waltonian. The site provides unrivalled sections in the Waltonian Crag essential to studies of Pleistocene stratigraphy, particularly with relevance to the lower limit of that period. The site yields abundant plant material from the Tertiary London Clay. Sections here in the A1 and A2 divisions of the formation offer a unique opportunity to study the flora in situ. This is the only locality to yield angiosperms preserved as carbonaceous compressions, invaluable for the study of small seed fossils. A key Tertiary palaeobotanical locality.
Holland Haven Marshes	Holland Haven Marshes in an area of reclaimed estuarine saltmarsh and freshwater marsh situated between Holland-on-Sea and Frinton-on-Sea. The site is bisected by Holland Brook and its tributaries, from which an extensive ditch system radiates. The ditch network represents an outstanding example of a freshwater to brackish water transition intimated by the aquatic plant communities, which include a number of nationally and locally scarce species. The adjoining grasslands are of botanical importance in their own right as well as acting as a buffer zone to the ditch system. Further interest is provided by the aquatic and terrestrial invertebrates and the birds which frequent the area, especially in winter.
Holland-On-Sea Cliff	Cliff exposures at Holland-On-Sea comprise an important stratigraphic site closely related to the diversion of the Thames. The latter event, of great significance to the geomorphological evolution of the London Basin, was the result of blocking of the early Thames Valley across central Essex by the Anglian Glaciation. At Holland two gravels are exposed, the site representing the type locality of both and therefore representing a stratigraphic site of considerable importance.
Clacton Cliffs and Foreshore	Foreshore and cliff exposures and excavations in the Clacton district have provided opportunities for the study of one of the most important Pleistocene interglacial deposits in Britain. The celebrated Clacton channel deposits are a sequence of freshwater and estuarine sediments occupying a channel cut into an earlier gravel accumulation and the underlying Tertiary London Clay. They have yielded abundant molluscan and mammalian fossil remains, fossil plants and pollen, all of which indicate a Hoxnian interglacial age. The deposits also contain the type site of the internationally significant Clactonian Industry which, based on a crude working technique, is believed to be stratigraphically earlier than the

SSSI name	Site Features
	Acheulian culture. The relationship between the Clacton Channel deposits and the other Pleistocene sediments of the area is poorly understood. There is need for further study of this critical site, which provides important comparisons, in a British context, with Hoxne and Swanscombe.
Colne Estuary	The Colne Estuary is comparatively short and branching, with five tidal arms which flow into the main river channel. The estuary is of international importance for wintering Brent Geese and Black-tailed Godwit and of national importance for breeding Little Terns and five other species of wintering waders and wildfowl. The variety of habitats which include mudflat, saltmarsh, grazing marsh, sand and shingle spits, disused gravel pits and reed beds, support outstanding assemblages of invertebrates and plants. Two areas of foreshore at East Mersea are of geological importance. Colne Point and St. Osyth Marsh are of geomorphological interest.
St Osyth Pit	St. Osyth Pit comprises an important sequence of Pleistocene deposits related to the diversion of the Thames during the Anglian glacial period. The lower part of the succession consists of Thames gravel of the pre-diversion 'Kesgrave' type i.e. deposited before the Thames was diverted by Anglian ice. This is overlain by sand and very fine gravel, the composition of the latter showing it to be distal outwash (deposited by meltwater from ice which had therefore arrived in the Thames catchment). The recognition of a comparable sequence elsewhere and of its relation to the terraces of the Tendring Plateau has shown that the outwash at St. Osyth reflects a brief period when the Thames was actually blocked by ice. The site is therefore of considerable stratigraphic importance in reconstructing the events of the Anglian glacial period.
Upper Colne Marshes	The Upper Colne Marshes lie along both sides of the River Colne and Roman River, south east of Colchester. The site consists of grazing marshes with associated ditch and open water habitats, a series of tidal salt marshes behind old flood defence walls following a number of breaches, the sea walls themselves, and a small area of intertidal mud. It is considered to be of special interest as it supports an outstanding assemblage of nationally scarce plants and an unusual diversity of brackish ditch-types. Additional interest is provided by the terrestrial and aquatic invertebrates found within the site, and breeding and wintering birds.
Blackwater Estuary	The Blackwater Estuary is the largest estuary in Essex north of the Thames and, indeed, is one of the largest estuarine complexes in East Anglia. Its mud flats, fringed by saltmarsh on the upper shores, support internationally and nationally important numbers of waterfowl which overwinter here. Shingle and shell banks and offshore islands are also a feature of the tidal flats. The surrounding terrestrial habitats - the sea wall, ancient grazing marsh and its associated fleet and ditch systems, plus semi-improved grassland - are also of high conservation interest. This rich mosaic of habitats supports an outstanding assemblage of nationally scarce plants and a nationally important assemblage of rare invertebrates, with 16 Red Data Book species and 94 notable and local species.
Dengie	Dengie is a large and remote area of tidal mudflat and saltmarsh at the eastern end of the Dengie peninsula, between the Blackwater and Crouch Estuaries. The saltmarsh is the largest continuous example of its type in Essex. Foreshore, saltmarsh and beaches support an outstanding assemblage of rare coastal flora. It is a resort for internationally and nationally important wintering populations of wildfowl and waders, and in summer supports a range of breeding coastal birds including rarities. The formation of cockleshell spits and beaches is of geomorphological interest.
Sandbeach Meadows	Sandbeach Meadows lie on alluvial deposits at the north-eastern end of the Dengie peninsula. The area of grassland is virtually all that remains of the once extensive grazing marshes which formed the hinterland of the nearby Dengie coastline. The seven fields are

SSSI name	Site Features
	sympathetically managed and support nationally important number of dark-bellied brent geese during the winter.
Foulness	Foulness lies on the north shore of the Thames Estuary between Southend in the south and the Rivers Roach and Crouch in the north. It comprises extensive intertidal sand-silt flats, saltmarsh, beaches, grazing marshes, rough grass and scrubland. The flats are of national and international importance as winter feeding grounds for nine species of wildfowl and wader, with the islands, creeks and grazing land forming an integral part as sheltered feeding and roosting sites. The shell banks support nationally important breeding colonies of Little Terns, Common Terns and Sandwich Terns. The complex matrix of habitats also supports nationally important numbers of breeding Avocets along with plants and invertebrates. Numerous species are locally restricted in their distribution and nationally uncommon or rare.
Crouch & Roach Estuaries	The rivers Crouch and Roach are situated in South Essex. The River Crouch occupies a shallow valley between two ridges of London Clay, whilst the River Roach is set predominantly between areas of brickearth and loams with patches of sand and gravel. The intertidal zone along the rivers Crouch and Roach is 'squeezed' between the sea walls on both banks and the river channel. This leaves a relatively narrow strip of tidal mud in contrast with other estuaries in the county. This however is used by significant numbers of birds, and together with the saltmarsh and grazing marsh which comprise the Crouch and Roach Estuaries SSSI regularly support internationally important numbers of one species, and nationally important numbers of three species of waders and wildfowl. Additional interest is provided by the aquatic and terrestrial invertebrates and by an outstanding assemblage of nationally scarce plants.
Benfleet & Southend Marshes	Benfleet and Southend Marshes comprise an extensive series of salt marshes, mudflats, scrub and grassland which support a diverse flora and fauna. The south-facing slopes of the downs, composed of London Clay capped by sand, represent the line of former river cliffs with several re-entrant valleys. At their foot lies reclaimed marshland, with its associated dyke system, based on alluvium. Outside the sea walls there are extensive salt marshes and mud-flats, on which wintering wildfowl and waders reach both nationally and internationally important numbers. Nationally uncommon plants occur in all of the habitats and parts of the area are of outstanding importance for scarce invertebrates.
NNR name	**Site Features**
Blackwater Estuary	Blackwater Estuary NNR is approximately 15 km south of Colchester and comprises two main areas: Tollesbury Flats and Old Hall Marshes. Tollesbury Flats is managed by Natural England and consists of a coastal strip close to the town of Tollesbury. This part of the reserve is closed to the public as it is a sensitive intertidal zone. Old Hall Marshes is managed by the RSPB and comprises the Old Hall Marshes Peninsula close to the village of Salcott. The marshes surround a lagoon called Pennyhole Fleet. The two areas are separated by an estuary, the Tollesbury Fleet. Tollesbury Flats supports a variety of invertebrates and is an important feeding area for many waterfowl including cormorants, brent geese, oystercatchers and plovers. Old Hall Marshes is home to a range of breeding and over-wintering waterfowl and a population of breeding bearded tits. The site also supports a number of nationally important plant and invertebrate species.

SSSI name	Site Features
Colne Estuary	Colne Estuary NNR comprises of three areas: Brightlingsea Marsh, East Mersea and Colne Point. Brightlingsea Marsh is an area of low-lying grazing marsh. The largest part of the site comprises unimproved grassland which is interspersed with a series of fleets (shallow creeks) and dykes. East Mersea is part of Mersea Island (separated from Brightlingsea by the Colne River estuary). The NNR area is a strip of coastal land that has been shaped by erosion and deposition. Cliff erosion has exposed important fossil remains and the site (which includes areas of saltmarsh) supports a number of rare plant species and large numbers of wintering wildfowl and waders. Colne Point comprises an extensive shingle spit system, a saltmarsh that has formed in the lee of the spit, and large areas of shell beds and shingle banks that are only exposed at low tide. The Point is important as a geomorphological feature and for the diverse plant and animal populations it supports.
Dengie	The Dengie peninsula consists of shall and gravel banks and an extensive area of saltmarsh. Amongst the species found at the site are Oystercatcher, Ringed plover, Redshank, Reed bunting, Hen harrier, Marsh harrier and Meadow pipit. The site is currently closed to the public.
Hamford Water	The reserve is a large estuarine basin comprising tidal creeks, intertidal mud and sand flats, and saltmarshes. Hamford Water is home to wintering populations of Dark-bellied brent geese, Black-tailed godwit, Redshank, Ringed and Grey Plover, Shelduck, Teal and Avocet. There is also a large breeding colony of Little Terns. During severe winter weather the area is an important refuge for wildfowl and waders. The reserve's saltmarshes support one of Britain's rarest coastal plants; Sea hogs fennel.
Leigh	The mud flats at Leigh NNR have a dense, vigorous growth of eel grass species which, together with their invertebrate populations, support large numbers of Dark-belled brent geese and waders such as Knot and Grey Plover. The saltmarshes are noted for their abundant plant life, in particular the five species of glasswort that grow there. The lower marshes are home to Sea aster, Small cordgrass and Glasswort species, while the upper marshes are dominated by Sea Purslane.

L10.6.3 Vulnerable freshwater / terrestrial sites

Much of the Essex coast is low lying and consists of reclaimed marshland, being protected from tidal inundation by a series of coastal defence structures. As a high proportion of this land is at or below mean sea level (MSL), it is at risk in the face of rising seas levels. **Table 2.7** presents those freshwater marshes which are either located wholly or partially within the 1 in 1000 year flood zone.

Table 2.7 Freshwater marshes located within the 1 in 1000 year flood zone within the study area.

Name	Designation
Trimley Marshes	Orwell Estuary SPA / SSSI
Holland Haven Marshes	Holland Haven Marshes SSSI
Horsey Island	Hamford Water SPA / SSSI
St Osyth Marsh	Colne Estuary SPA / SSSI

Name	Designation
Wick Marsh	Colne Estuary SPA / SSSI
Brightlingsea	Colne Estuary SPA / SSSI
Lagenhoe Marsh	Colne Estuary SPA / SSSI
Maydays Marsh	Not in SSSI – north Mersea Island Defined by the Essex Coast Environmentally Sensitive Area designation. Potential habitat for waders, geese and ducks both overwintering and on passage.
Reeveshall Marsh	Not in SSSI – north Mersea Island Noted for its reedbed, providing suitable habitat for marsh harriers. Also provides potential habitat for waders, geese and ducks both overwintering and on passage.
Feldy Marshes	Not in SSSI – just west of West Mersea Level grazing marshes and potential habitat for overwintering waders, geese and ducks.
Old Hall Marshes	Blackwater Estuary SPA / SSSI
Tollesbury Wick Marshes	Blackwater Estuary SPA / SSSI
Ramsey Marshes	Blackwater Estuary SPA / SSSI
Bradwell Marshes	Sandbeach Meadows SSSI
Tillingham Marshes	Not in SSSI – 3 km east of Tillingham Potential nesting, roosting and feeding ground to 18 bird species of both national and international importance which visit the Dengie peninsula.
Dengie Marshes	Not in SSSI – 4 km east of Southminster Potential nesting, roosting and feeding ground to 18 bird species of both national and international importance which visit the Dengie peninsula.
Fambridge Marshes	Crouch and Roach Estuaries SPA / SSSI
Foulness	Foulness SPA / SSSI
Hadleigh Marsh	Not in SSSI - 1.5km southwest of Leigh-on-Sea Potential habitat for waders, geese and ducks both overwintering and on passage.

L10.7 Population & communities

L10.7.1 Land Use Planning Policy

The environmental issues on the Essex coast are central to the development of land use planning policy at the regional and local level. In regard to this, the three planning documents critical to identifying the environmental issues in this context are:

- Tendring District Council Adopted Local Plan (to be replaced by the Tendring District Council Local Development Framework in 2010);
- Maldon District Council Local Development Framework Core Strategy Document (in progress – expected mid 2009);
- Rochford District Council Local Plan 2006. Scheduled to be replaced by the Rochford Local Development Framework in June 2009.
- Colchester District Council Local Development Framework Core Strategy 2008;
- Southend-on-Sea Borough Local Development Framework; and
- East of England Plan 2008 (East of England Regional Assembly, May 2008).

Plans and pertinent policy is presented in further detail in **Appendix A**.

The main issues for land use plans on the Essex coast are flood risk, sustainable development and designated sites (for nature conservation). A further key issue for land use plans in the context of an SMP relates to their compatibility with the Habitats

Regulations, especially where land is allocated for housing, employment or other uses which may prejudice SMP policies. For example, housing allocations in areas currently prevented from flooding by flood defence structures or practices would make it more difficult to undertake managed retreat or abandon existing defences. Managed realignment or no active intervention options may be preferred, or necessary in response to coastal squeeze, which may be adversely affecting international sites.

Planning Policy Statement (PPS) 25 sets out government policy on development in relation to flood risk. Broadly speaking, this seeks to avoid development in flood prone areas, or undertaking any development which may lead to enhanced flood risk. PPS 25 requires local authorities to undertake Strategic Flood Risk Assessments (SFRAs) to assist in developing LUPs and LDFs, such that they achieve these objectives.

Adherence to PPS 25 guidance will ensure that the likelihood of development occurring which will prejudice SMP policies is minimised. However, it does not entirely preclude the possibility that detrimental impacts may result and individual local plans thus need to be examined to identify any constraints which may act “in combination” with SMP policies. This is particularly relevant in the case of the two Local Authorities concerned, given that large amounts of their coastal fringe is within Flood Zone 1. Flood Zone 1 is defined as an area within which there is a 1 in 200 year (0.5% per annum) or greater probability of coastal, or 1 in 100 year (1% per annum) or greater probability of fluvial flooding (assuming the absence of defences). PPS 25 states that in Flood Zone 1, there should be a presumption against non-essential development but that this may be acceptable in already developed areas.

L10.7.2 Catchment Flood Management Plans (CFMPs)

The Catchment Flood Management Plans for this area provide a strategic approach to the management of flood risk in fluvial areas adjacent to the coast. The two relevant CFMPs for the Essex Coast are the North Essex and the South Essex plans (which were published in 2008).

Both plans provide a suite of common broad objectives, which relate to the approach of policy to social, economic and environmental objectives. The objectives offered, which are pertinent to SMPs are as follows:

SOCIETY: To minimise risk to human life;
To minimise community disruption;
To maintain critical infrastructure; and
To protect and improve cultural heritage.

ECONOMY: To minimise economic harm through flooding.

ENVIRONMENT: To protect and enhance habitats and species.

Under these objectives the CFMPs have identified a series of features which are considered critical to management of the catchments. Each feature is then described in terms of the opportunities for policy. Relevant elements of this process have been fed into the SMP assessment criteria contained within this document. Whilst differences remain in the issues facing fluvial and coastal management, some common features and opportunities exist. The CFMPs both contain a series of objectives, including:

Biodiversity: The need to maintain or enhance biodiversity.

Fisheries: To improve the size, condition and recreational value of natural fish stocks.

Landscape: To safeguard, enhance and reduce flooding of regionally & nationally important landscape features.

Geomorphology: To restore the natural appearance and processes of rivers.

Cultural, Architectural and Archaeological: To safeguard, enhance and reduce flooding of important heritage sites.

Damage to Agricultural Land: To reduce flooding and degradation of important soils and agricultural land

Water Quality: To help improve chemical and biological water quality in line with regional, national and international targets.

The identification of objectives in this way, coupled with the specification of opportunities to address issues, has been used to aid in the development of assessment criteria for use in this SEA Scoping Report.

L10.7.3 Blue Flag beaches

The Blue Flag award is given to coastal destinations which have achieved the highest quality in water, facilities, safety, environmental education and management. Since its inception, it has acted as an incentive to many beach managers to improve the quality of the coast, leading to a revival of the UK coastline and beaches around the world, being particularly important for tourism. The 2008 Blue Flag beaches in Essex are listed below:

- Brightlingsea Beach;
- Dovercourt Bay; and
- Jubilee Beach.

L10.7.4 Coastal communities

Several communities are located along the Essex coastline, with SMP policy having the potential to impact these areas. Due to the low-lying nature of much of the Essex coast, many of these communities are located within the 1 in 1000 flood zone and therefore are at risk of coastal inundation or coastal erosion. Areas likely to be subject to erosion will be defined in the various scenarios within the SMP. The risk to settlements is considered in the wider context, so the loss due to flooding of key areas or assets of a settlement would clearly have an effect on population located outside the floodplain, but within the band of coastal settlements. The communities located along the Essex coast and within the 1 in 1000 flood zone are listed in **Table 2.8 (Note –** Not all of the population of the settlements below necessarily live in the flood zone).

Table 2.8 **Coastal communities along the Essex coastline and within the 1 in 1000 flood zone (population statistics from National Statistics, 2001)**

Coastal Community	District Council	Population estimates (2001 census)
Felixstowe	Suffolk Coastal	24,052
Ipswich	Ipswich Borough Council	121,000
Sproughton	Ipswich Borough Council	No information available
Maidenhall	Ipswich Borough Council	No information available
Shotley Gate	Ipswich Borough Council	2,380
Chrurch End	Braintree District	No information available
Harwich	Tendring District	20,130
Parkeston	Tendring District	No information available
Manningtree	Tendring District	5,628
Mistley	Tendring District	1,684
Walton-on-the-Naze	Tendring District	12,000
Kirkby-le-Soken	Tendring District	1,488
Holland-on-Sea and Clacton-on-Sea	Tendring District	51,284
Jaywick and Seawick	Tendring District	4,665
Brightlingsea	Tendring District	8,146
Ramsey	Tendring District	No information available
Point Clear	Tendring District	1,438
St Lawrence	Tendring District	No information available
Colchester	Colchester Borough	104,390
West Mersea	Colchester Borough	6,792
Tollesbury	Colchester Borough	2,680
Rowhedge	Colchester Borough	1,591
Burnham-on-Crouch	Maldon District	7,636
Maylandsea	Maldon District	3,604
Maldon and Heybridge	Maldon District	20,731
North Fambridge	Maldon District	700
Bradwell Waterside	Maldon District	No information available
Goldhanger	Maldon District	No information available
South Woodham Ferrers	Chelmsford District	16,629
Hullbridge	Chelmsford District	6,050
Battlesbridge	Chelmsford District	No information available
Southend-on-Sea	Southend-on-Sea Borough	160,257
Courtsend	Southend-on-Sea Borough	No information available
Canvey Island	Castlepoint District	37,479
Benfleet	Castlepoint District	48,539
Great and Little Wakering (including Barling)	Rochford District	5,248
Ridgemarsh	Rochford District	No information available
Rochford	Rochford District	16,374

L10.7.5 Wealth & deprivation

The 2001 census data gives a total population for Essex of 1,310,835 people. There are 39 small areas within the county that are designated 'seriously deprived' that fall into the 20% most deprived areas nationally. Jaywick in Tendring is the third most deprived area in England. Overall, Essex falls just inside the 20% least deprived counties in England in terms of overall deprivation. Of the districts within the county, Tendring is the one with the highest overall level of deprivation. The figures in **Table 2.9** below show the percentage of small areas that are considered seriously deprived with regard to employment and income.

Table 2.9 Percentage of small areas that are seriously deprived in terms of employment and income

District	% areas income deprived	% areas employment deprived
Tendring	**12**	**18**
Maldon	**2**	**0**
Colchester	**4**	**3**
Rochford	**2**	**2**
Southend-on-Sea	**Not listed – unitary authority**	**Not listed – unitary authority**

L10.7.6 Key tourism features

Key tourism features along the Essex coast and within the 1 in 1000 year flood zone are listed in **Table 2.10**.

Table 2.10 Key tourism features along the Essex coast and within SEA study area

Location	Attraction
Suffolk Coast and Heaths AONB	Stretching south from Lowestoft to the river Stour, the AONB protects heathland, reed beds, salt-marsh and mud-flats, a rich mixture of unique and vulnerable lowland landscapes.
Dedham Vale AONB	AONB protects an exceptional example of a lowland river valley. The designated area of the AONB stretches upstream from Manningtree to within one mile of Bures.
Stour Estuary RSPB Reserve	Popular site for birdwatchers. The site receives a large number of migratory birds in the autumn and large flocks of feeding birds in the winter.
Brightlingsea	Blue flag beach. Popular tourist destination in the summer. Yachting activities are widespread in the area.
Southend-on-Sea	Important tourist destination. Southend-on-Sea has 3 blue flag beaches. There are also adventure parks, nature reserves, museums and galleries.
Clacton-on-Sea	Clacton has a pleasure pier, arcades, a golf course and caravan parks. The beaches are popular with tourists in the summer.
Old Hall Marshes RSPB Reserve	Extensive grazing marshes with brackish water fleets, reedbeds, saltmarsh and two offshore islands. In winter, thousands of wildfowl come here and in the summer the sight is popular for its breeding waders.

L10.7.7 Critical Infrastructure

Critical infrastructure within the Essex SMP SEA study area is presented in **Table 2.11**. Many of the larger coastal settlements are served by a network of "B" class roads, with much of the remaining road network being single-track roads. Additionally, the study

area includes Bradwell power station which has an active remaining timeline within Epoch 1 of the SMP

Table 2.11 Critical infrastructure within the Essex SMP SEA study area

Critical Infrastructure	Description
A154	Road which links the port of Felixstowe to the A14. Important route for commercial usage.
A14 (T)	Vital road linking Felixstowe peninsula to Ipswich and the rest of the country, but very prone to congestion due to lack of alternate routes.
A137	Connects Ipswich to Colchester. Not a major route but is used to get to smaller settlements such as Manningtree.
A120	Main road leading into Harwich, important route for holidaymakers using the port.
A414	Connects Maldon to Chelmsford, but not a heavily used route.
A132	Small road that connect South Woodham Ferrers to the A130 which leads to Southend-on-Sea. Not a heavily used route.
Harwich International Port	Multipurpose port, the port is primarily involved with ferry operations.
Felixstowe Port	The largest container port in the UK and 5th largest in Europe, employs over 2,700 people. The port is recognised as a strategic employment site of regional and national importance.
Railway line between Burnham-on-Crouch and South Woodham Ferrers	Railway connects small settlements together, ultimately leading to Southend-on-sea. Is not on the main route so is mainly used by commuters and local people.
Railway line in Manningtree and Harwich	This railway connects Manningtree to Harwich and thus connects Harwich to the rest of the country. This rail link connects to the port which is a key destination for holidaymakers going abroad.
Railway and freight line in Southend-on-Sea	The railway connects Southend-on-Sea to London. Easy access route for tourists.
Railway line into Felixstowe port	Important commercial link for businesses to the port.
Railway in Ipswich	Connects Ipswich to Norwich and Cambridge.
Bradwell nuclear power station	Provides electricity for the national grid and has a lifespan within epoch 1.

L10.8 Soil

Soil types found along the coast of Essex reflect closely the underlying drift deposits, and Tertiary London Clays and sands. The soils most commonly found along the coast are associated with marine alluviums. Such soils tend to be deep and largely clayey and tend to be found forming the marshlands of the Colne and Blackwater estuaries, the Rivers Roach and Crouch, the length of the Dengie and Foulness as well as much of the Roach archipelago. A more silty and calcareous soils is more evident on the seaward

side of Dengie and Foulness and gives rise to good quality soils that have been traditionally used for arable farming.

Marsh hinterlands are formed on the clayey soils and loams that have developed on the London Clay and terrace gravels. Finer loamy soils are found on Mersea that have given rise to grasslands and some arable usage. Gravels underlie the well-drained, dark brown loams evident in the Tollesbury area, supporting small areas of woodland and arable and horticultural crops.

Slightly higher terrain exists above the London Clays, leading to clayey soils and where overlain by river terrace gravels, loamy soils. Clayey, frequently waterlogged soils sit on higher ground behind the marshes along the Blackwater and Crouch.

In areas where London Clays and drift deposits are overlain by river terrace gravels, for example around Heybridge, in the Dengie hinterlands and between the Crouch and the Roach, good quality soils are evident supporting crops and horticultural activities. Large amounts of the gravel have been removed for commercial use.

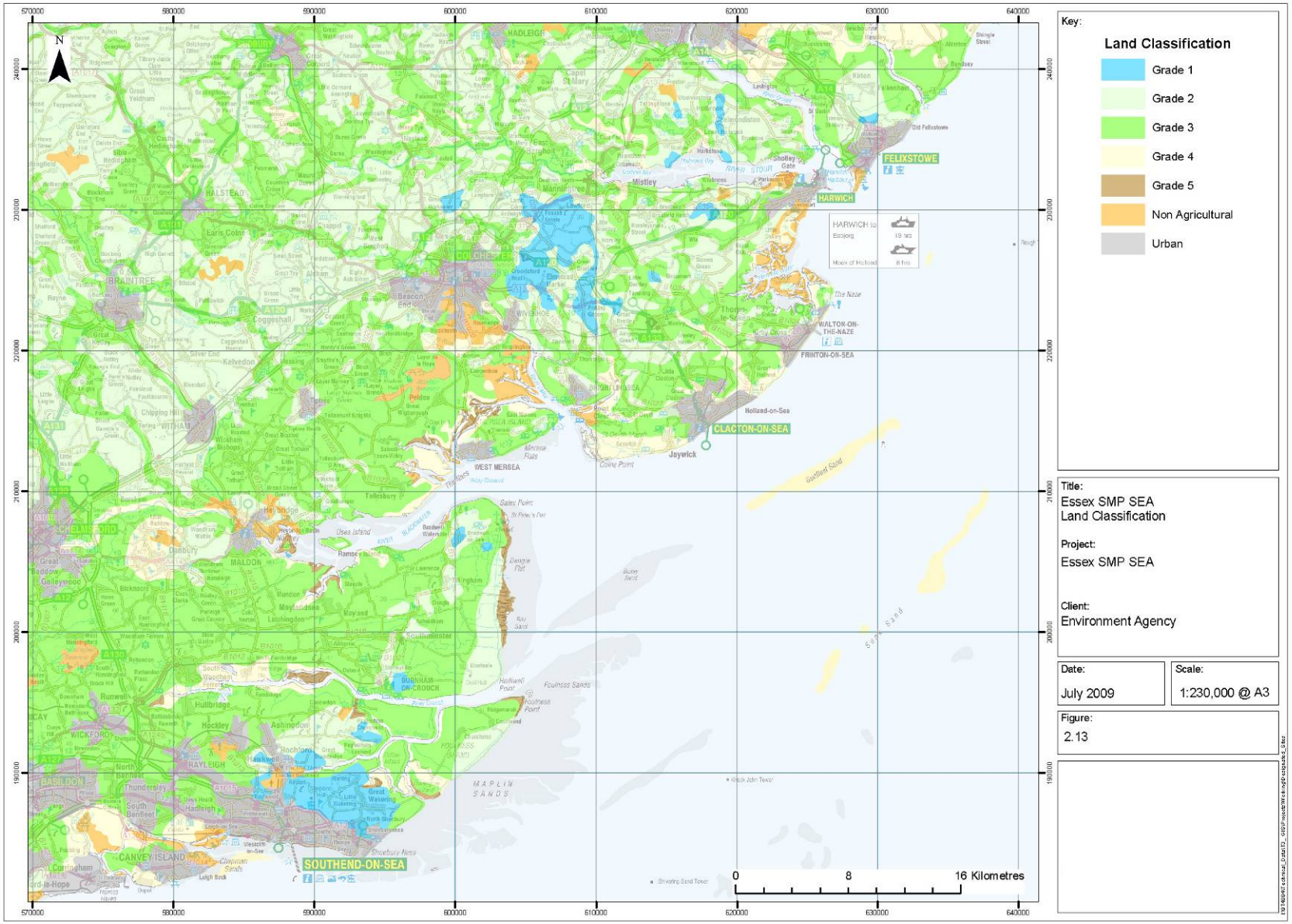
The majority of agricultural land within the 1 in 1000 year flood zone along the Essex coast is classified as Grade 3 land. Due to a favourable combination of climate and soils, subsidised production and national/international policies, the agricultural land in Essex is dominated by intensive cereal production. The location of different sectors is largely related to the distribution of soil types across the county (Essex County Council, 2006). Some of the most productive agricultural land in Essex lies on the Dengie peninsula and surrounds (CLA, 2009).

Table 2.12 provides information relating to land classification within the 1 in 1000 year flood zone, which is graphically presented in **Figure 2.13**.

Table 2.12 **Quantification of land classification within the 1 in 1000 year flood zone along the Essex coastline**

Land Grade	Area in hectares
Grade 1	838.5
Grade 2	5964.7
Grade 3	22803.9
Grade 4	5718.9
Grade 5	308.2
Non Agricultural	2284.7
Urban	1781.7

Figure 2.13 Land classification map for the Essex SMP SEA study area



L11 ENVIRONMENTAL ISSUES AND ASSESSMENT CRITERIA

In this section the environmental issues for the Essex coast are identified and a series of corresponding assessment criteria provided which will form the basis of the assessment of SMP policy.

L11.1 Environmental Issues

From a consideration of the policy, legislation and designations relevant to the Essex coast and supported by discussions with key stakeholders as part of the SMP process, a series of **environmental issues** have been identified. These issues are an expression of the environmental considerations relating to coastal areas which the SMP needs to address in the delivery of providing policy for coastal erosion and flood risk management. The issues suite has been developed to avoid a reliance on generic coastal management issues (although some issues are the same around the coast and are therefore included) and has provided an account of what other plans, management obligations and stakeholders consider to be the most critical environmental issues on the Essex Coast.

The suite of issues provided is as follows:

1. **The need to maintain a balance of providing navigation and access to estuary communities;**
2. **Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce;**
3. **Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast;**
4. **Potential loss of historic and archaeological features on a dynamic coastline;**
5. **Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types;**
6. **Maintenance of Balance of Coastal Processes on a Dynamic Linear Coastline with Settlements Along Estuaries;**
7. **Maintenance of Water Supply in the Coastal Zone;**
8. **Threat to the environmental conditions to support biodiversity and the quality of life; and**
8. **Maintenance of coastal processes required for sustainable coastal management and the integrity of critical coastal habitat and species.**

The issues and assessment table (**Table 3.1**) provides a detailed account of how these issues are explicitly evident on the Essex coast. **Table 3.1** clearly illustrates these issues in detail and specifies matters that will be scoped in and scoped out of the assessment, subject to the conclusions of this scoping consultation.

In response to each specific issue a series of **assessment criteria** have been developed, which will ensure that the assessment of SMP policy is focussed on the key environmental issues of this area.

Table 3.1 Issues and Assessment Table

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS
Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types			
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitat Species
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitat
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitat Species
Maintenance of coastal processes required for sustainable coastal management and the integrity of critical coastal habitat and species			
The effects of coastal processes on land quality/use and land sediment derived on the Essex Coast.	Not applicable.	Not applicable.	Soil
Maintenance of environmental conditions to support biodiversity and the quality of life			
The need to ensure that water quality is not adversely affected as a result of SMP policy.	To be established in the context of the ongoing WFD assessment of the Essex SMP	To be established in the context of the ongoing WFD assessment of the Essex SMP	Water
Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries			
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).	
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.	
Maintenance of water supply in the coastal zone			
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS
boreholes at risk from erosion.		Changes of salinity in the freshwater aquifer attributable to SMP policy.	
Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast			
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities
Potential loss of historic and archaeological features on a dynamic coastline			
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment
Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce			
Protection of coastal towns and settlements			
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities
Protection of key coastal infrastructure			

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the national interest and the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities
The need to maintain a balance of providing navigation and access to estuary communities			
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to comities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities

L11.2 Assessment criteria

As stated above, assessment criteria have been developed in response to the key environmental issues identified for the Essex SMP area. The use of assessment criteria is a recognised way of considering the environmental effects of a plan or programme and comparing the effect of alternatives. Assessment criteria are used to:

1. Help show whether the objectives of the SMP are beneficial to the study area's environment;
2. Compare the environmental effects of alternative options under consideration; and
3. Identify and recommend mitigation and enhancement.

The overarching assessment criteria for this SEA have been derived from the environmental considerations and issues identified within the scope of this SEA and the SMP process itself. The SMP process has a clearly articulated measured approach which provides for the consideration of environmental issues at the core of the process.

NOTE As stated above, in the course of producing the objectives for the SMP, a review of other plans relevant to the study areas was undertaken. From this, the objectives of these supporting plans fed the process of producing objectives for the SMP. It therefore follows, that the SMP objectives are inclusive of the environmental objectives of the other plans discussed in **Appendix A**.

The Scoping Report should set out the following and through consultation seek agreement on:

- The baseline environment for the SMP and how it might develop over the study period (No Active Intervention and With Present Management scenarios);
- The role of relevant plans and projects in this area;
- To identify the key issues for this SEA which relate to the SMP objectives (listed in **Section 1.5.1**); and
- To define the assessment criteria which relate to the key issues / objectives and allow the policy options to be judged for performance against the SMP objectives.

For all Assessment Criteria, the relevant **Receptors** are identified (as defined in Section 1) and specified in **Tables 1.3** and **Table 3.1** to ensure that the assessment stage has regard to the key issues of the Essex Coast in a manner targeted towards the actual receptors of possible effects.

L12 CONSULTATION

In this section, the consultation which is planned to be undertaken throughout the SEA is summarised. It outlines:

- The purpose of consultation and the methods used; and
- The manner in which feedback will be included into the SEA process.

L12.1 Approach

The consultation for this SEA will be based on an initial consultation period for the Scoping Report (this document) followed by a period of consultation for the draft SMP which will be supported by the information in the Environmental Report (and other documents).

This report represents **STEP 1** of the consultation process and is intended to ensure that the methodology, baseline and draft assessment criteria are appropriate for the strategic assessment of the SMP. This report will be provided for five weeks of consultation to:

- Environment Agency;
- English Heritage;
- Natural England;
- Tendring District Council;
- Chelmsford Borough Council;
- Suffolk Coastal District Council;
- Ipswich Borough Council;
- Babergh District Council;
- Colchester Borough Council;
- Maldon District Council;
- Braintree District Council;
- Rochford District Council
- Southend-on-Sea Borough Council; and
- Essex County Council.

Following the consultation on **STEP 1**, the Draft SEA key issues list and assessment criteria will be refined and will be used in the evaluation of SMP policy.

The key purpose of this report is to gain feedback from the agencies listed above to address the following questions:

1. **Has the Scoping Report correctly identified the environmental issues on the Essex Coast? (i.e. are there additional issues which need to be addressed?)**
2. **Has the baseline (in combination with the Theme Review and Characterisation report) provided an appropriate level of detail to support the assessment?**
3. **Do the Assessment Criteria provide an appropriate mechanism for the assessment of the environmental effects of the SMP?**

4. **Is the suggested methodology considered robust and appropriate to the assessment of the environmental effect of the SMP?**

Once the SMP desired policy has been selected and offered in draft form for consultation, an **ENVIRONMENTAL REPORT** will be provided which shows a detailed assessment of the selected scenario and feasible alternatives. Consultation on SMP process will therefore support **STEP 2** of the SEA consultation process, and SMP consultation is expected to be provided in October 2009.

Following approval of the SMP a Post-Adoption Statement will be produced with will identify how public response to the Environmental Report has been taken into account. If changes are required to the draft SMP, following consultation, a revised **ENVIRONMENTAL REPORT** will be provided for consultation which will also include details of monitoring the effect of SMP policy on the SEA objectives. This will be **STEP 3** of the consultation process.

L12.2 Key Issues raised through Consultation

Key issues raised through the consultation process on this Scoping Report will feed back into the SEA (as an iterative process).

Key issues from this consultation exercise will be detailed in the **ENVIRONMENTAL REPORT**.

L13 NEXT STEPS

In this section the process of providing the SEA alongside the SMP process will be described through to the production of the **ENVIRONMENTAL REPORT**.

L13.1 Active use of the SEA within the SMP Process

Following consultation on this **SCOPING REPORT**, the assessment criteria will be used to evaluate policy scenarios for the SMP. The SEA will therefore provide a key instrument in the assessment and refinement of SMP policy. This active use of the SEA will happen alongside the use of:

- The Appropriate Assessment under the Habitats Directive for the SMP; and
- Consideration of the requirements of the Water Framework Directive.

Suggested policy will be developed as a preferred option; at this stage the SEA will be used to clearly demonstrate how environmental considerations have been addressed within the SMP process. To this end, the SEA will provide a transparent account of how environmental matters have been addressed and how this has shaped policy selection. This will culminate in the provision of the **ENVIRONMENTAL REPORT**.

As a component of the Environmental Report, the SEA Monitoring Plan will provide a series of actions, based on the indicators provided, which will ensure that unexpected consequences of the plan will be identified.

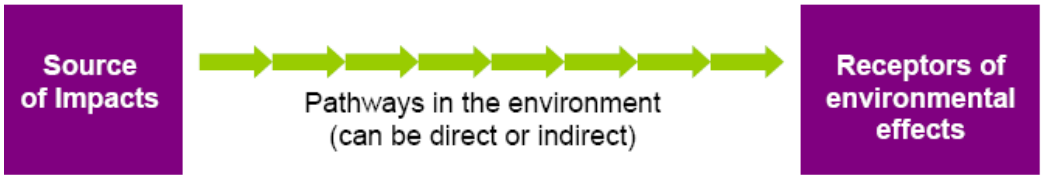
L13.2 Context and methodology

The SEA process is clearly defined in the SEA Regulations and guidance suite. The basic process follows the provision of a Scoping Report (this document) which provides the baseline, identifies key environmental issues, outlines the methodology and offers a series of assessment criteria. Following consultation on this document and the development and assessment of SMP policy, an Environmental Report will be produced which details and records the actual assessment. Subsequent to this, a Post Adoption Statement will be provided which will details the manner in which the assessment will be used to ensure that the actual effects of the SMP are accounted for through monitoring and response.

L13.3 Prediction and Evaluation Methodology

The methodology we will use to identify and predict the likely significant environmental effects of implementing the plan is described below. To assess the environmental effects of implementing the SMP, we will adopt an evidence based expert judgement system. This approach is based on the widely accepted Source-Pathway-Receptor model (SPR) (**Figure 12.1**).

Figure 12.1 The Source-Pathway-Receptor model as applied to SEA



The appraisal will be a qualitative exercise based on professional judgment and supported by peer-reviewed literature where possible. It is important to stress that given the nature of SMP policy, which is high level and therefore lacks the detail of an actual scheme, the assessment will be based on established effects wherever possible, but will rely heavily on expert judgement of anticipated effects. The performance of each SMP policy against each assessment criteria will be given a significance classification in addition to a short descriptive summary (e.g. widespread negative effects with no uncertainty). For each SMP policy, the assessment table will also include a more comprehensive rationale of the judgment process used for determining the environmental effects and likely significance of each SMP policy. In particular, the following considerations will be paramount in determining environmental effect and likely significance:

- Value and sensitivity of the receptors;
- Is the effect permanent / temporary;
- Is the effect positive / negative;
- Is the effect probable / improbable;
- Is the effect frequent / rare;
- Is the effect direct / indirect;
- Will there be secondary, cumulative and / or synergistic effects.

Table 12.2 Environmental Impact Significance Categorisation

Significance of SMP Policy	
	SMP policy is likely to result in a significant positive impact on the environment.
	SMP policy is likely to have a positive or minor positive impact on the environment (dependant on scheme specifics at implementation).
	SMP policy is likely to have a neutral or negligible effect on the environment.
	SMP policy is likely to have a negative or minor negative impact on the environment (dependant on scheme specifics at implementation).
	SMP policy is likely to have a significant negative impact on the environment.
	The relationship between the SMP policy and the environment is unknown or unquantifiable.

The assessment will be recorded on a series of assessment tables (**Table 12.3**), with each SMP policy benefiting from a clear and transparent account of its likely effects on the environment and the significance of such effects.

Table 12.3 Method of impact derivation for environmental effect and likely significance

Environmental issue	Scoped in	Indicator	Receptor	Assessment

Data will be required to support the assessment of likely effects on a range of environmental receptors. This assessment will be based on available information and will have regard to the relatively abstract nature of SMP policy (in comparison to scheme level data).

The use of appropriate receptors has been considered in the development of assessment criteria, whereby the manner in which each receptor (in response to the environmental issues of the Essex coast) is affected by SMP will be clearly described. Where gaps in knowledge exist (relating to the information required to support an assessment of the link between policy and receptor), expert judgement will be used or a decision of unquantifiable effect recorded.

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Appendix A

Plans and pertinent policy

Source	Objective
East of England Regional Spatial Strategy (RSS): Objectives of the sub-regional strategy	In the northern part of the region: • major change in the Cambridge sub-region, to achieve a more sustainable balance between job growth and housing development • a matching focus on other key regional centres (Norwich, Peterborough and Ipswich) and other regionally significant towns (Bury St Edmunds and King's Lynn) to provide economic and urban development • priority for the economic regeneration of Great Yarmouth and Lowestoft, for localised pockets of deprivation in all the above centres and the rural areas and market towns. In the southern part of the region: • consideration of major growth pressures and potential in the Stansted/M11 area, and around Milton Keynes (immediately outside but affecting the region) • national and regional priority for regeneration of the Thames Gateway (RPG9 extended this in south Essex up to Southend-on-Sea) and the definition of additional 'priority areas for economic regeneration' at Luton/Dunstable, Harlow and the Lee Valley, and the Harwich/Clacton area.
	Policy SS1: achieving sustainable development • The spatial strategy aims to achieve a sustainable relationship between jobs, homes and services at the strategic and local level. It requires a sequential approach to the location of major development as a core component of sustainable development. Conserving the region's environment, quality of life, local character and natural resources, whilst adapting to climate change, together with tackling the problems of social inclusion and deprivation are also key strands in achieving sustainable development; and • Local development documents will first consider the reuse of land and buildings within urban areas, then extensions to those areas, and finally other locations where there is good accessibility to public transport, or where proposed development can contribute to improving public transport access.
	Policy SS2: overall approach to the spatial strategy • In order to achieve a close correlation between homes, jobs and community facilities, urban areas will be the main focus for development and redevelopment in the region; • A sequential approach to the location of new development will be adopted to deliver the quality of life improvements set out in the vision; and • Local development documents will ensure a balanced and deliverable supply of land for employment, housing, and supporting services, by encouraging the change of use of land where alternative development would represent a more sustainable land-use and allow for proposals that would make more efficient use of vacant and underused land and property
	Policy SS3: development in and adjoining urban area • Greenfield land releases should be appropriate in scale to the adjoining urban area. Significant urban extensions should be large enough to provide a sustainable form of development, in relation to employment, public transport provision, and social, health, education, and community facilities provision.

Source	Objective
	Policy SS4: use of previously developed land and buildings • At least 60% of all new development in the region will take place in or using previously used land or buildings. Local development documents will identify and allocate suitable previously developed land and buildings for new development with a view to contributing to this target.
	Policy SS5: town centres • Thriving, vibrant and attractive town centres are fundamental to the sustainable development of the East of England and they will continue to be the focus for investment, environmental enhancement and regeneration.
	Policy SS6: transport strategy • Transport delivery agencies will improve accessibility and support the economic and spatial development of the region; • Improving accessibility to jobs, services and leisure/tourist activities; • Reducing the need to travel, while addressing the problems of congestion, economic regeneration and further housing growth as well s strategic movement to neighbouring regions, ports and airports; and • Minimising environmental damage and improving safety and security
	Policy SS7: green belt • The broad extent of green belts in the East of England Is considered to be appropriate, and will be maintained; • Some urban area green belts need reviewing as part of an appraisal to identify the most sustainable locations for new development; and • In order to maintain the broad extent of green belts in the region, reviews will consider if compensating additions to the green belts are needed.
	Policy SS8: land in the urban fringe Local development documents will: • Ensure that new development contributes to enhancing the character, appearance, recreational and biodiversity value of the urban fringe; • Seek to provide connected networks of accessible green space linking urban areas with the countryside; and • Set targets for the provision of green space for planned urban extensions.
	Policy SS9: development in rural areas In order to sustain the viability and secure revitalisation of the region's market towns, local authorities will consider the need to: • Accommodate additional housing, employment growth and economic diversification; • Enhance the environment of the town centre; • Improve the accessibility of the town by public transport from surrounding rural areas; • Extend provision for shopping facilities and services in the town centre; and • Improve access to high-speed communications technology to assist economic diversification.
	Policy SS10: the regional economy • The regional economy will be supported and developed to ensure that it contributes fully to national, regional and local prosperity in order to improve quality of life for those who live and work in the Region. Opportunities provided by the relationship with the European economy, the London economy and other neighbouring economies will be exploited and will follow the principles of sustainable development.

Source	Objective
	Policy SS11: priority areas for regeneration • The spatial strategy aims to secure sustainable economic, social and environmental development across the whole of the East of England, in both urban and rural areas. • The priority areas are therefore concentrated on some of the larger urban areas and on the more peripheral north and east of the region.
	Policy SS12: health, education and social inclusion • Seek early provision of services and facilities closely coordinated with development, particularly in the Government's Sustainable Communities Plan growth areas and in the priority areas for regeneration
	Policy SS13: overall housing provision • Within the regional provision for 23,900 units, social rented housing should be provided at a regional annual average rate of at least 7,200 net additional dwellings, or 30% of overall provision. In addition to this, at least 760 net additional units per year should be provided for key worker housing. The region will also aspire to provide higher provision in the period up to 2015 to reduce the level of unmet housing need and address intermediate housing needs.
	Policy SS14: development and flood risk • Coastal and river flood risk is a significant factor in the East of the England. The priority is to defend existing properties from flooding, and where possible locate new development in locations with little or no risk of flooding; and • Promote the use of strategic flood risk assessments to guide development away from floodplains, areas at risk or likely to be at risk in future from flooding, or where development would increase the risk of flooding elsewhere
Planning Policy Statement (PPS) 25: Development and Flood Risk	• The aims of planning policy on development and flood risk are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. Where new development is, exceptionally, necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall. • In areas at risk of river or sea flooding, preference should be given to locating new development in Flood Zone 1.If there is no reasonably available site in Flood Zone 1, the flood vulnerability of the proposed development can be taken into account in locating development in Flood Zone 2 and then Flood zone 3.Within each Flood Zone new development should be directed to sites at the lowest probability of flooding from all sources *Zone 1 (Low Probability)* • This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%). • All uses of land are appropriate in this zone *Zone 2 (Medium Probability)* • This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year. • The water-compatible, less vulnerable and more vulnerable uses

Source	Objective
	of land and essential infrastructure are appropriate in this zone.* *Zone 3a (High Probability)* • This zone comprises land assessed as having a 1 in 100 or greater annual probability of flooding from the sea (>0.5%) in any year. • The water-compatible and less vulnerable uses of land are appropriate in this zone.* • The highly vulnerable uses should not be permitted in this zone.* • Essential infrastructure permitted in this zone should b e designed and constructed to remain operational and safe for users in time of flood.* *Zone 3b (The Functional Floodplain)* • This zone comprises land where water has to flow or be stored in times of flood. It has an annual probability of 1 in 20 (5%) or greater in any year or is designated to flood in an extreme (0.1%) flood. • Only the water-compatible uses* and the essential infrastructure* that has to be there should be permitted in this zone. It should be designed and constructed to: o Remain operational and safe for users in times of flood; o Result in no net loss of floodplain storage; o Not impede water flows; and o Not increase flood risk elsewhere
Tendring District Council Local Plan (2007)	**Policy QL1 - Spatial Strategy** The spatial strategy for Tendring to 2011 follows established national and regional principles for sustainable development. • Most new development will therefore be concentrated at the larger urban areas of Clacton and Harwich, where accessibility to employment, shops, and other facilities and services is maximised, and there is a choice of means of transport. These towns also contain the largest supply of previously developed land, for use in general preference to greenfield sites. • In the smaller towns and villages, limited development consistent with local community needs will be permitted. Development will be concentrated within the following settlement development boundaries.
	Policy QL3 – Minimising and Managing Flood Risk The Council will ensure that flood risk is taken into account at all stages in the planning process, to avoid inappropriate development in areas at risk of flooding. Development will only be permitted in areas of flood risk when there are no reasonably available sites in areas of lower flood risk and the benefits of development outweigh the risks of flooding. Therefore for all proposed sites within Flood Zones 2 and 3, it must be demonstrated that there are no reasonably available sites in a lower flood risk area. The flood vulnerability of the proposed use must match the flood risk probability of the site. Higher vulnerability uses must be located on the part of the site of the lowest probability of flooding. Where development is shown to be required in Flood Zone 2 or 3, compliance with the exception test should be demonstrated for the required development types. Only where the exception test is passed will planning permission be exceptionally granted.

Source	Objective
	A Flood Risk Assessment is required to be submitted with all planning applications for new development on land within Flood Zones 2 and 3. Within Flood Zone 1 proposals on sites of 1 hectare or more will be required to submit a Flood Risk Assessment to consider drainage and flooding from other sources.
	Policy QL5 – Economic Development and Strategic Development Sites The following strategic employment sites are allocated for development in order to encourage new economic activity and employment opportunities: • Bathside Bay (122ha) as an extension to Harwich International Port – for the development of a deep water quayside, container handling area, rail terminal, logistics facility and associated infrastructure; Land East of Pond Hall Farm (27ha gross) is allocated for the development of a new business park for storage and distribution, along with general and light industrial uses
	Policy QL6 – Urban Regeneration Areas The following areas are identified on the Local Plan Proposals Maps as Urban Regeneration Areas: a) Clacton Seafront and Town Centre b) West Clacton and Jaywick c) Dovercourt Town Centre and adjoining areas d) Harwich e) Walton Seafront and Town Centre f) Brightlingsea Waterfront; and g) Mistley Waterfront and Village. Within these Urban Regeneration Areas permission will be granted for development that reinforces and/or enhances the function, character and appearance of the area and contributes towards regeneration and renewal. In particular, the Urban Regeneration Areas will be the focus for: • Investment in social, economic and transportation infrastructure; and Initiatives to improve vitality, environmental quality, social inclusion, economic prospects, education, health, community safety and accessibility.
	Policy ER1 – Employment Sites Land is allocated for employment development (Class B1 [(b) and (c)], B2 and B8) at the following locations: • Harwich Area: 24.57ha • Brightlingsea Area: 2.67ha
	Policy ER16 – Tourism and Leisure Uses Proposals for tourism and leisure uses will be permitted provided that: • the development is accessible to all potential visitors and users; • there is suitable vehicular and public transport access to the site and parking provision, especially where the proposal is likely to generate large traffic volumes. Proposals should be located close to the main road network and link to other public rights of way wherever possible; • the type of use proposed would not cause undue disturbance by reason of noise. Uses creating high levels of noise should be located well away from residential property and sensitive wildlife areas; • there will not be an adverse effect on agricultural holdings and the proposal would not result in an irreversible loss of high quality agricultural land; and where appropriate opportunities are taken to improve damaged and despoiled landscapes and enhance the landscape character of the area.
	Policy COM32 - Sea Defences In order to maintain and enhance the interests of marine and coastal habitats the District Council will, where appropriate, require the use of soft engineering sea defences such as wider and deeper beaches or the rehabilitation of salt marshes,

Source	Objective
	as a means of sea defence, rather than the installation of or raising of sea walls or other hard defences. Planning permission will not be granted for development, which would adversely affect the integrity of tidal or fluvial defences, unless the removal or alteration to those defences is necessary to achieve the purpose of the development.
	Policy HG1 - Housing Provision Provision is made for a net dwelling stock increase of 6,250 dwellings in Tendring District in the period 1 April 1996 to 31 March 2011 in accordance with Policy H1 of the Adopted Essex and Southend-on-Sea Replacement Structure Plan. Future general housing needs in the Tendring District Local Plan 2007 Period 2004 to 2011 will be met by the development of sites allocated for residential or mixed use development and appropriate unidentified sites that meet PPG3 paragraph 31 sustainability criteria and are located within the defined development boundaries of towns and villages. A recycling target of 80% of the Plan's provision between 2004 and 2011 is proposed on previously developed land.
	Policy COM15 - Coastal Water Recreation Facilities Proposals for new water-based recreational facilities or the renewal or extension of existing facilities will be permitted in coastal towns and resorts where the following criteria are met: a) the size and location of the development is appropriate to its setting; b) there will be no undue harm to the amenity of neighbouring residents; c) the surrounding highway network and access to the site is satisfactory; d) the site is accessible by a choice of means of transport; e) no undue harm will be caused to the townscape; f) no undue damage will be caused to local landscape, nature conservation or biodiversity; and g) there will be no safety hazard created by the users either to each other, to bathers or other users of the seafront amenities. When considering such proposals the Council will require a full noise impact assessment to be submitted in relation to the proposed use of powered watercraft.
	Policy COM16 - Hamford Water, the Stour Estuary and the Colne Estuary No further extension of areas currently used for boat moorings, the establishment of new marina/boat facilities or other water recreation facilities will be permitted outside existing Settlement Development Boundaries in the undeveloped estuaries and inlets of Hamford Water, the Stour Estuary or the Colne Estuary unless it can be demonstrated that there will be no damaging impact on the relevant SSSI, SAC, SPA and Ramsar sites. In exceptional cases where consent may be granted any adverse impact on the environment must be satisfactorily mitigated.
	Policy COM35 – Managed Re-Alignment Proposals for alternative "soft" or "natural" engineering methods of sea defence, including managed re-alignment and foreshore recharge will be encouraged where appropriate to ensure sustainable flood management. Schemes should be designed so as to maximise nature conservation benefits with respect to local landscape impact considerations. Access to and along the coastline will be maintained by ensuring that public rights of way affected by managed re-alignment are diverted by formal Public Path Orders to the 'new coastline' in order to maintain recreational access along the coastline in accordance with the aims of the Essex Heritage Coastal Trail. The protection of sites of archaeological importance will also be an important consideration. In providing managed realignment areas which are located in or adjacent to

Source	Objective
	international sites, new access arrangements must not increase the nature or degree of accessibility to the international sites such that it will increase physical or non-physical disturbance to designated international features, or otherwise adversely affect site integrity. Proposals should ensure that areas of newly designated/ created SAC is at least the same as the original habitat, taking into account any land take required by new access infrastructure (i.e paths).
	Policy EN3 - Coastal Protection Belt New development which does not have a compelling functional need to be located in the Coastal Protection Belt, as defined on the Proposals Map, will not be permitted. The onus will be on the applicant to prove such a need, by showing that by reason of its critical operational requirements the development cannot be located outside the Coastal Protection Belt. Even where a compelling functional need is demonstrated, the development should not significantly harm the landscape character and quality of the undeveloped coastline.
	Policy EN11a - Protection of International Sites: European Sites and Ramsar Sites Development, which may affect a European Site, a proposed European Site or a Ramsar site, will be subject to the most rigorous examination. Development that is not directly connected with or necessary to the management of the site for nature conservation, which is likely to have significant effects on the site (either individually or in combination with other plans or projects) and where it cannot be ascertained that the proposed would not adversely affect the integrity of the site, will not be permitted unless: • There is no alternative solution; • There are imperative reasons of over-riding public interest for the development; and • And in the event that (i) and (ii) above are met, an appropriate compensatory habitat is provided. Where the site concerned hosts a priority natural habitat type and/or a priority species, development or land use changes will not be permitted unless the Council is satisfied that it is necessary for reasons of human health or public safety or for beneficial consequences of primary importance for nature conservation.
	Policy EN11b – Protection of National Sites: Sites of Special Scientific Interest, National Nature Reserves, Nature Conservation Review sites, Geological Conservation Review sites. Development in or likely to affect Sites of Special Scientific Interest will be subject to special scrutiny. Where such development may have an adverse effect, directly or indirectly on the special interest of the site it will not be permitted unless the reasons for the development clearly outweigh the nature conservation value of the site itself and the national policy to safeguard such sites. Where the site concerned is a National Nature Reserve (NNR) or a site identified under the Nature Conservation Review (NCR) or Geological Conservation Review (GCR) particular regard will be paid to the individual site's national importance. Where development is permitted the Council will consider the use of conditions or planning obligations to ensure the protection and enhancement of the site's nature conservation interest.
	Policy EN11c – Protection of Local Sites: Local Nature Reserves, County Wildlife Sites, Regionally Important Geological/Geomorphological Sites Development likely to have an adverse effect on a Local Nature Reserve, a

Source	Objective
Rochford District Council Local Plan (2007)	County Wildlife Site or a Regionally Important Geological/ Geomorphological Site, will not be permitted unless it can be clearly demonstrated that there are reasons for the proposal which outweigh the need to safeguard the substantive nature conservation value of the site. In all cases where development is permitted which would damage the nature conservation value of the site or feature, such damage will be kept to a minimum. Where appropriate the Council will consider the use of conditions and/or planning obligations to provide appropriate mitigation and compensatory measures.
	Policy COM33 - Flood Protection In order to minimise the effects of tidal flooding, permission will be refused for development on land to the seaward side of sea defences, including the siting of temporary structures such as holiday chalets and caravans. On land between the first line of sea defence and the main defence, the siting of temporary structures may be permitted following consultation with the Environment Agency. Time limited occupancy conditions will be imposed and enforced preventing occupancy during the winter period from November to March inclusive when the risk of tidal inundation is greatest.
	Policy NR5 – European and International sites Proposals for development which may affect a Special Area of Conservation (either candidate or designated), Ramsar site or Special Protection Area will be subject to the most rigorous examination. Development not directly connected with or necessary to the management of the site, and which would have significant effects on the site (either singly or in combination with other plans and projects), and where it cannot be ascertained that the proposals would not adversely affect the integrity of the site, will not be permitted unless it can be clearly demonstrated that there is no alternative solution and that the development is necessary for imperative reasons of overriding public interest.
	Policy NR6 – Sites of Special Scientific Interest Proposals for development which is likely to have an adverse impact, either directly or indirectly, on a Site of Special Scientific Interest (SSSI) will not be permitted unless the justification for the development clearly outweighs the national nature conservation interest of the site. If there is risk of damage to a designated site from development the Local Planning Authority will endeavour to enter into a planning obligation with the developers to secure future site management or to make compensatory provision elsewhere for losses expected when development occurs.
	Policy NR10 – Coastal protection belt Within the Coastal Protection Belt priority will be given to the protection of the rural and undeveloped coastline. Applications for development will not be granted planning permission unless it can be shown that the development would not adversely affect the open and rural character of the coastline, or its historic features, wildlife or geological features.
	Policy NR11 – Development within flood risk areas Applications for development within flood risk areas will be accompanied by full flood risk assessments to enable the Local Planning Authority to properly consider the level of risk posed to the proposed development throughout its lifetime, and the effectiveness of flood mitigation and management measures. Within developed areas of a flood risk area development may be permitted, subject to the conclusions of the flood risk assessment and the suitability of the flood mitigation and management measures recommended therein. Within sparsely developed and undeveloped areas of a flood risk area, commercial, industrial and new residential development will not be permitted except in exceptional cases. Other applications (including applications for the

Source	Objective
	replacement of existing dwellings on a one-for-one basis) will be considered on their merits, having regard to the conclusions of the flood risk assessment and the suitability of the flood mitigation and management measures recommended therein. Within the functional floodplain buildings will not be permitted except in wholly exceptional cases. Other applications will be considered on their merits, having regard to the conclusions of the flood risk assessment and the suitability of the flood mitigation and management measures recommended therein.
	Policy NR13 – Creation of intertidal habitats The creation of new intertidal habitats will be permitted provided it can be demonstrated through consultation with the appropriate bodies that the benefits of the proposed new habitats clearly outweigh the resultant loss of other natural habitats, agricultural or other land.
Maldon District Council Local Development Framework Core Strategy	**Strategic Objectives (relevant to SMP SEA)** • S ii. To protect and enhance the coast and countryside, recognising the contribution of their intrinsic character and beauty and the diversity of their landscapes, heritage and wildlife, the wealth of natural resources and the character, ecology and economy of the District. • S v. To retain and protect the existing retail base in urban and rural areas. • S vi. To improve access to and the provision of sport and leisure facilities and enhance tourism for all. • S vii. To create a sustainable and accessible environment in which living, working and leisure encourage pride in the District, recognising its important historic qualities. • S ix. To control development within the natural, man-made and statutory constraints that exist in and apply to the District.
	POLICY S2 Development outside development boundaries Outside development boundaries defined in the Local Plan, the coast and countryside will be protected for their own sake, particularly for their landscape, natural resources and areas of ecological, historical, archaeological, agricultural and recreational value.
	POLICY CON1 Development in Areas at Risk from Flooding Development in areas at risk of flooding as shown by the latest Flood Risk Maps will only be permitted where: 1) There are no alternative sites suitable for the type of proposed development at lower risk of flooding as set out in Table 1 of PPG 25, taking account of all sustainability criteria; and 2) It would not have an adverse impact on the function of the flood zone; 3) It would not increase the risk of flooding elsewhere.
	POLICY CON3 Coastal Defence Proposals for soft engineering methods of coast protection or flood defence will only be permitted where they will ensure sustainable flood management of the estuary, taking into account: 1) the protection of life, agricultural land, homes and places of work; 2) nature conservation and archaeological interests; and 3) habitat creation.
	POLICY CC1 Development Affecting an Internationally Designated Nature Conservation Site Development likely to have a direct or indirect effect on a Ramsar site, Special

Source	Objective
	Protection Area or Special Area of Conservation will not be permitted unless it is necessary for reasons of overriding public interest. Any such proposals will be subject to the most rigorous examination. Where development is permitted, the use of conditions or planning obligations will be considered, to avoid and/or minimise harm to the site, to enhance the site's nature conservation interest and to secure any compensatory measures and appropriate management that may be required.
	POLICY CC2 Development Affecting a Nationally Designated Nature Conservation Site Development likely to have a direct or indirect effect on a National Nature Reserve, Site of Special Scientific Interest or Environmentally Sensitive Area will not be permitted unless the need for the development clearly outweighs the importance of the site or the effects can be satisfactorily mitigated. Where development is permitted, the use of conditions or planning obligations will be considered, to avoid and/or minimise harm to the site, to enhance the site's nature conservation interest and to secure any compensatory measures and appropriate management that may be required
	POLICY CC3 Development Affecting Locally Designated Nature Conservation Sites Proposals for development within or affecting areas designated as Local Nature Reserves (LNR), Wildlife Sites (WS) (formerly SINCs), or Regionally Important Geological Sites (RIGS) will not be permitted unless: 1) The reasons for the proposal outweigh the need to safeguard the conservation or geological value of the site, and 2) The proposal does not cause loss or damage to the nature conservation or geological interest of the site in which the development is proposed, or 3) Any adverse or potentially adverse effects on a LNR, WS or RIGS of a proposal will be satisfactorily mitigated, for example through the creation of habitats of equal quality and value elsewhere on the site or in the District.
	POLICY CC4 Local Nature Reserves The creation and management of Local Nature Reserves will be encouraged. Sites identified as proposed LNRs on the Proposals Map shall be reserved for that purpose: 1) Ironworks Water Meadow, Maldon (CC4/1) 2) Heybridge Creek, Heybridge (CC4/2) 3) Heybridge Gravel Pits, Heybridge (CC4/3)
	POLICY CC5 Protection of Wildlife at Risk on Development Sites 1) Planning permission will not be granted for any development that would be liable to cause demonstrable harm to a species of animal or plant, or its habitat, protected under law, unless conditions are attached requiring the developer to take steps to secure their protection. 2) If development is likely to affect features of nature conservation interest, planning permission will not be granted for development there unless either: (a) The development would not harm them; or (b) Adequate mitigation measures are put in place; or (c) The importance of the development outweighs the value of the

Source	Objective
	features. 3. Where there is special wildlife value, or where wildlife gains can be achieved, the developer will be required to: (a) Take steps during development to secure the protection of the nature conservation interest; (b) Carry out any identified mitigation measures; (c) Carry out any identified habitat enhancements. 4. Relocation of the wildlife interest from the development site will only be considered in exceptional circumstances.
	POLICY CC6 Landscape Protection The natural beauty, tranquillity, amenity and traditional quality of the District's landscape will be protected, conserved and enhanced. Proposals for development in the countryside will only be permitted provided that: 1) No harm is caused to the landscape character in the locality; 2) The location, siting, design and materials are appropriate for the landscape in which the development is proposed, and 3) The development is landscaped to protect and enhance the local distinctiveness and diversity of the landscape character of the area in which it is proposed.
	POLICY CC7 Special Landscape Areas Within Special Landscape Areas permission will not be given for development unless its location, siting, design, materials and landscaping conserve or restore the character of the area in which the development is proposed. The Special Landscape Areas are: • Chelmer - Blackwater Ridges • Dengie Marshes • Crouch - Roach Marshes • Blackwater - Colne Estuary • Upper Crouch • Woodham Scarp
	POLICY CC10 Historic Landscape Features Development will not be permitted which would have a materially adverse impact upon landscape features of historic importance, such as ancient woodlands, registered parks and gardens, registered battlefields, protected lanes and hedgerows. Any proposal, which would give rise to a material increase in the amount of traffic using protected lanes, will not be permitted.
	POLICY CC11 The Coastal Zone Within the defined Coastal Zone, development will only be permitted if:- 1) It requires a coastal location or is associated with an existing use within the Coastal Zone; 2) The location, siting, design, materials and landscaping would not adversely affect the open and rural character of the area, its historic features and its wildlife; 3) It has minimal impact on views into and out of the area; 4) It meets an essential overriding local need which cannot be met within the settlement development boundaries; and 5) Every reasonable effort is made to use previously developed land and/or buildings in preference to undeveloped land.

Source	Objective
	POLICY CC13 Protection of the Best and Most Versatile Agricultural Land Development will not be permitted if it would result in the loss of the best and most versatile agricultural land within grades 1, 2 and 3a of the DEFRA land classification system, unless all the following criteria are met: 1) There is an overriding need for the development and it is allowed under other policies in the Plan; 2) Land in grades below 3a is unavailable or impractical for the purpose proposed, which does not have an environmental value recognised by a statutory designation; and 3) The development is proposed on land of the lowest practicable grade.
	POLICY BE13 Development in Conservation Areas Development including extensions to existing buildings in Conservation Areas will only be permitted if all of the following criteria are met: 1) The design is of a high standard incorporating scale, form, materials and detailing that respect the characteristics of buildings in the area. 2) Open spaces important to the character or historic value of the area are protected. 3) Important views within, into and out of the area are protected. 4) Trees and other landscape features contributing to the character or appearance of the area are protected.
Colchester District Council Adopted Core Strategy (December 2008)	**Environment and Rural Communities Policies – ENV 1 Environment** The Borough Council will conserve and enhance Colchester's natural and historic environment, countryside and coastline. The Council will safeguard the Borough's biodiversity, geology, history and archaeology through the protection and enhancement of sites of international, national, regional and local importance. In particular, developments that have an adverse impact on Natura 2000 sites or the Dedham Vale Area of Outstanding Natural Beauty will not be supported. Within the Coastal Protection Belt development will not be permitted that would adversely affect the open and rural character of the undeveloped coastline, and its historic features, sites of nature conservation importance and wildlife habitats. The network of strategic green links between the rural hinterland, river corridors, and key green spaces and areas of accessible open space that contribute to the green infrastructure across the Borough will be protected and enhanced. Development will be supported at appropriate locations to improve public access, visual amenity and rehabilitate the natural environment. Development will need to minimise and mitigate adverse impacts on river, coastal and ground water quality. The Council will seek to direct development away from land at risk of fluvial or coastal flooding in accordance with PPS25, including areas where the risk of flooding is likely to increase as a result of climate change. Unallocated greenfield land outside of settlement boundaries (to be defined/reviewed in the Site Allocations DPD) will be protected and where possible enhanced, in accordance with the Landscape Character Assessment. Within such areas development will be strictly controlled to conserve the environmental assets and open character of the Borough. Where new

Source	Objective
	development needs, or is compatible with, a rural location, it should demonstrably: 1) be in accord with national, regional and local policies for development within rural areas, 2) including those for European and nationally designated areas; and 3) be appropriate in terms of its scale, siting, and design; and 4) protect, conserve or enhance landscape and townscape character, including maintaining settlement separation; and 5) protect, conserve or enhance the interests of natural and historic assets; and 6) apply a sequential approach to land at risk of fluvial or coastal flooding in line with the guidance of PPS25; and 7) protect habitats and species and conserve and enhance the biodiversity of the Borough; and 8) provide for any necessary mitigating or compensatory measures.
	Environment and Rural Communities Policies – ENV 2 Rural Communities The Borough Council will enhance the vitality of rural communities by supporting appropriate development of infill sites and previously developed land (PDL) within the settlement development boundaries of villages. The design and construction of new village development must be high quality in all respects, including design, sustainability and compatibility with the distinctive character of the locality. Development should also contribute to the local community through the provision of relevant community needs such as affordable housing, open space, local employment, and community facilities. Outside village boundaries, the Council will favourably consider small-scale rural business, leisure and tourism schemes that are appropriate to local employment needs, minimize negative environmental impacts and harmonise with the local character and surrounding natural environment. Development outside but contiguous to village settlement boundaries may be supported where it constitutes an exception to meet identified local affordable housing needs. Towns and villages are encouraged to plan for the specific needs of their communities by developing Parish Plans and Village Design Statements for adoption as guidance.
Southend-on-Sea Core Strategy January 2007	**Policy CP4: The Environment and Urban Renaissance** Development proposals will be expected to contribute to the creation of a high quality, sustainable urban environment which enhances and complements the natural and built assets of Southend. This will be achieved by (aspects specific to SMP SEA): 1) Safeguarding, protecting and enhancing nature conservation sites of international, national and local importance; and 2) Protecting natural resources from inappropriate development. **Policy G6 – Nature Conservation** Development will not be permitted in those areas delineated on the Proposals Map (refer to Southend-on-Sea Local Development Framework Development Plan Document 4 – Seafront Area Action Plan) as being within a nature reserve, site of special scientific interest or Ancient Woodland, or which are subsequently notified as such, unless it can be shown that there will be no adverse effects on

Source	Objective
	plants or animals in their natural surroundings and that physical and natural features will be protected. The Council will also seek to protect wildlife habitats identified elsewhere as being important to nature conservation. The advice of relevant nature conservation agencies and local organisations will be sought in relation to proposed development affecting identified wildlife habitats. The Council will also seek the proper management and maintenance of sites identified as being of nature conservation value, in particular Sites of Special Scientific Interest, Nature Reserves and Ancient Woodlands. **Policy G7 – Coastal Protection** There shall be the most stringent restrictions on development in those coastal areas of Belton Hills, Leigh Marshes and Two Tree Island delineated on the Proposals Map. Proposals for recreation development will be permitted within these areas only if they are open and informal in nature and do not adversely affect its rural character and wildlife or important local views.
Suffolk Coastal District Council (SCDC): Local Plan and other documents considered	**Planning Policy** It is in towns where most development, particularly of a large scale, is more appropriately located. The coastal towns, potentially affecting the SMP, identified in the Suffolk Structure Plan and confirmed in this Local Plan are: *Felixstowe Peninsula South (Felixstowe, Trimley St Martin and Trimley St Mary)* • Has developed its tourism role in terms of services, facilities and accommodation, which builds on the qualities and facilities offered by the town of Felixstowe, creating strong links between the seafront and town centre areas and the qualities of the surrounding natural environment; and • Is well defended from risk of flooding and coastal erosion. • Other than developments required to implement the provisions of the Felixstowe Dock and Railway Act, 1988 and its associated legal agreements, any development or third port access routes will be opposed. The possibility of a new access road to the quays is considered. • If not required for new road access to the quayside, land to the rear of premises on Parker Avenue is identified as a General Employment Area to which Policy AP51 will apply. • A suitably screened, surfaced and landscaped public car park will be provided with access from Ferry Road. The District Council will support measures to reduce the visual and physical impact of car parking on the Common, particularly within the vicinity of the Ferry Church, Harbour Villas, and Ferry Boat Inn by appropriate earth banking and landscaping, to create small greens. • The frontage of Sea Road is considered to make an important contribution to the health and vitality of the resort. Therefore, recreation / leisure / tourist activities, self-catering / serviced accommodation and retailing are deemed the most appropriate uses and will therefore be encouraged. • This area is basically that bounded by Orford Road, Langer Road, Manor Road, Manor Terrace and the seawall. The area is low lying and may be liable to shallow flooding. The major use would be a seafront park, which could be a significant attraction. A space to accommodate a permanent market could be a complementary use.

Source	Objective

	• Whilst recognising the contribution which the site makes to the supply of accommodation in Felixstowe for tourists, the District Council would encourage redevelopment of the land currently used for static and touring caravans at Manor Terrace for chalets, if carried out to a high standard of design and subject to access and infrastructure criteria.
	• The District Council will protect the open character of the land which separates the physical limits of Felixstowe from those of Trimley St Mary, and the physical limits of Trimley St Mary (including a small part of the parish of Trimley St Martin) from those of Trimley St Martin.
	• Following the Seafront and Town Centre Masterplan, suggestions of building a leisure path along the seafront in Felixstowe emerged. The path would widen the public access and extend the length of the seafront in the town. Other improvements to the seafront proposed within this report included pier improvements, works on sea defences, cycle paths, a winter garden, cafes, improved public amenities and street furniture. The main areas for the improvements are Undercliff Road West, Sea Road, Convalescent Hill, Wolsey Gardens, Bent Hill, Orwell Road, Crescent Road and Hamilton Road. Other key projects included for evaluation in the master plan include:
	  • Bent Hill – a road improvement scheme, with the objective of making the route more 'user friendly', by creating shared space between traffic and pedestrians. This scheme will be the responsibility of SCC to implement and is subject to funding from the Local Transport Plan;
	  • South Seafront Regeneration – this scheme involves the property development company Bloor Homes and will create a new visitor attraction at the Martello tower and gardens. This scheme cannot go ahead until the coastal defence works have been completed; and
	  • Landguard Visitor Centre – this scheme will be implemented using funds created from the Felixstowe Port South Reconfiguration project. The scheme will not be implemented until the second stage of the reconfiguration project is underway.

Water Framework Directive	Environmental objectives: Article 4.1: 1(a)(i) member states shall implement the necessary measures to avoid deterioration of the status of all bodies of surface water; 1(c) Member States shall achieve compliance with any standards and objectives at the latest 15 years after the date of entry into force of this Directive, unless otherwise specified in the Community legislation under which the individual protected areas have been established; the **main environmental objectives** in the Directive are manifold and include the following elements (for details see Article 4 §1, (a) surface waters, (b) groundwaters and (c) protected areas): • ***No deterioration*** of status for surface and groundwaters and the protection, enhancement and restoration of all water bodies; • Achievement of ***good status*** by 2015, i.e. good ecological status (or • potential) and good chemical status for surface waters and good chemical • and good quantitative status for groundwaters; • ***Progressive reduction of pollution*** of priority substances and ***phase-out*** of priority hazardous substances in surface waters and prevention and

Source	Objective
	limitation of input of pollutants in groundwaters; • ***Reversal*** of any significant, upward ***trend*** of pollutants in groundwaters; • Achievement of standards and objectives set for ***protected areas*** in Community legislation.
Habitats Directive	The main previsions of the Habitats Directive include: • Whereas the preservation, protection and improvement of the quality of the environment, including the conservation of natural habitats and of wild fauna and flora, are an essential objective of general interest pursued by the Community, as stated in Article 130r of the Treaty; • Whereas the European Community policy and action programme on the environment (1987 to 1992)(4) makes provision for measures regarding the conservation of nature and natural resources; • Whereas, the main aim of this Directive being to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements, this Directive makes a contribution to the general objective of sustainable development; whereas the maintenance of such biodiversity may in certain cases require the maintenance, or indeed the encouragement, of human activities; • Whereas, in the European territory of the Member States, natural habitats are continuing to deteriorate and an increasing number of wild species are seriously threatened; whereas given that the threatened habitats and species form part of the Community's natural heritage and the threats to them are often of a transboundary nature, it is necessary to take measures at Community level in order to conserve them; • Whereas, in view of the threats to certain types of natural habitat and certain species, it is necessary to define them as having priority in order to favour the early implementation of measures to conserve them; • Whereas, in order to ensure the restoration or maintenance of natural habitats and species of Community interest at a favourable conservation status, it is necessary to designate special areas of conservation in order to create a coherent European ecological network according to a specified timetable; • Whereas all the areas designated, including those classified now or in the future as special protection areas pursuant to Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds(5), will have to be incorporated into the coherent European ecological network; • Whereas it is appropriate, in each area designated, to implement the necessary measures having regard to the conservation objectives pursued; • Whereas sites eligible for designation as special areas of conservation are proposed by the Member States but whereas a procedure must nevertheless be laid down to allow the designation in exceptional cases of a site which has not been proposed by a Member State but which the Community considers essential for either the maintenance or the survival of a priority natural habitat type or a priority species; • Whereas an appropriate assessment must be made of any plan or programme likely to have a significant effect on the conservation objectives of a site which has been designated or is designated in future; • Whereas it is recognized that the adoption of measures intended to promote the conservation of priority natural habitats and priority species of Community interest is a common responsibility of all Member States; whereas this may, however, impose an excessive financial burden on certain Member States given, on the one hand, the uneven distribution of

Source	Objective
	such habitats and species throughout the Community and, on the other hand, the fact that the "polluter pays" principle can have only limited application in the special case of nature conservation; • Whereas it is therefore agreed that, in this exceptional case, a contribution by means of Community co-financing should be provided for within the limits of the resources made available under the Community's decisions; • Whereas land-use planning and development policies should encourage the management of features of the landscape which are of major importance for wild fauna and flora; • Whereas a system should be set up for surveillance of the conservation status of the natural habitats and species covered by this Directive; • Whereas a general system of protection is required for certain species of flora and fauna to complement Directive 79/409/EEC; whereas provision should be made for management measures for certain species, if their conservation status so warrants, including the prohibition of certain means of capture or killing, whilst providing for the possibility of derogations on certain conditions;
Birds Directive	The main provisions of the Directive include: • The maintenance of the favourable conservation status of all wild bird species across their distributional range (Article 2) with the encouragement of various activities to that end (Article 3). • The identification and classification of Special Protection Areas for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance (Article 4). (Together with Special Areas of Conservation (SACs) designated under the Habitats Directive, SPAs form a network of pan-European protected areas known as Natura 2000.) • The establishment of a general scheme of protection for all wild birds (Article 5). • Restrictions on the sale and keeping of wild birds (Article 6). • Specification of the conditions under which hunting and falconry can be undertaken (Article 7). (Huntable species are listed on Annex II.1 and Annex II.2 of the Directive). • Prohibition of large-scale non-selective means of bird killing (Article 8). • Procedures under which Member States may derogate from the provisions of Articles 5-8 (Article 9) — that is, the conditions under which permission may be given for otherwise prohibited activities. • Encouragement of certain forms of relevant research (Article 10). • Requirements to ensure that introduction of non-native birds do not threatened other biodiversity (Article 11).

Appendix B
Pertinent legislation

A. The Convention on the Conservation of European Wildlife and Natural Habitats

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and came into force in 1982. The principal aims of the Convention are to ensure conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to regulate the exploitation of those species (including migratory species) listed in Appendix 3. To this end the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species (JNCC, 2008i).

To implement the Bern Convention in Europe, the European Community adopted Council Directive 79/409/EEC on the Conservation of Wild Birds (the EC Birds Directive) in 1979, and Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the EC Habitats Directive) in 1992 (JNCC, 2008i). Among other things the Directives provide for the establishment of a European network of protected areas (Natura 2000), to tackle the continuing losses of European biodiversity on land, at the coast and in the sea to human activities (JNCC, 2008i).

The UK ratified the Bern Convention in 1982. The Convention was implemented in UK law by the Wildlife and Countryside Act (1981 and as amended) (JNCC, 2008i). As the inspiration for the EC Birds and Habitats Directives, the Convention had an influence on the Conservation (Natural Habitats &c.) Regulations (1994) and the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995, which were introduced to implement those parts of the Habitats Directive not already covered in national legislation (JNCC, 2008i).

B. The Convention on Biological Diversity

Biological diversity - or biodiversity - is the term given to the variety of life on Earth and the natural patterns it forms (JNCC, 2008j). The biodiversity we see today is the fruit of billions of years of evolution, shaped by natural processes and, increasingly, by the influence of humans. It forms the web of life of which we are an integral part and upon which we so fully depend, providing a large number of goods and services that sustain our lives. Biodiversity consists of hierarchical levels, encompassing the range of landscapes and ecosystems found on the planet, the communities of organisms found within them, the variety of animal, plant and micro-organism species of which these communities consist, and the genetic differences within each species. All of these levels are linked by natural (or semi-natural or human-induced) processes, from gene-flow at the genetic level through to successional habitat change at the landscape level. It is the combination of life forms and their interactions with each other and with the rest of the environment that has made Earth a uniquely habitable place for humans. However, biodiversity is threatened by many factors, including habitat destruction and degradation, pollution, climate change and introduced species. The loss of biodiversity affects food supplies, opportunities for tourism and recreation, sources of medicines, and energy. It also interferes with essential ecological functions.

The Convention on Biological Diversity (Biodiversity Convention or CBD) was adopted at the Earth Summit in Rio de Janeiro, Brazil in June 1992 and entered into force in December 1993 (JNCC, 2008j). As the first treaty to provide a legal framework for biodiversity conservation, the Convention established three main goals: the conservation

of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising from the use of genetic resources (JNCC, 2008j). Contracting Parties are required to create and enforce national strategies and action plans to conserve, protect and enhance biological diversity. They are also required to undertake action to implement the thematic work programmes on ecosystems and a range of cross-cutting issues which have been established to take forward the provisions of the Convention (JNCC, 2008j).

Within Europe, the Pan-European Biological and Landscape Diversity Strategy was developed in 1994 to introduce a coordinating and unifying framework for strengthening and building on existing initiatives which support the implementation of the CBD (JNCC, 2008j). In 1998, the European Community Biodiversity Strategy was adopted, defining a precise framework for action, by setting out four major themes and specifying sectoral and horizontal objectives to be achieved. In 2001, this was followed by the production of Biodiversity Action Plans (BAPs) for fisheries, agriculture, economic cooperation and development, and conservation of natural resources. These sectoral Action Plans define concrete actions and measures to meet the objectives defined in the strategy, and specify measurable targets.

The UK ratified the Convention in June 1994 (JNCC, 2008j). Responsibility for the UK contribution to the Convention in the UK lies with the Department for Environment, Food and Rural Affairs (Defra), who promote the integration of biodiversity into policies, projects and programmes within Government and beyond. Further to this, in 1994 the Government launched the UK Biodiversity Action Plan (UK BAP), a national strategy which identified broad activities for conservation work over the next 20 years, and established fundamental principles for future biodiversity conservation (JNCC, 2008j). Subsequently, costed Biodiversity Action Plans (BAPs) to conserve 391 species and 45 habitats were published. Local Biodiversity Action Plans (LBAPs) have also been identified as important in the implementation of the strategy, and 163 have so far been developed (JNCC, 2008j).

C. The Convention on the Conservation of Migratory Species of Wild Animals

Migration is a natural phenomenon, by which individuals of a given species move between areas which they inhabit at different times of the year (JNCC, 2008k). Migratory species of animals are, on average, more at risk of becoming endangered than non-migratory species, because their requirements are greater; not only do they need good habitat for reproduction but also during their non-breeding and all along their migratory routes (JNCC, 2008k). In an ever-changing world, human pressure is high on some of those habitats, and also often on the animals themselves (hunting, incidental catch etc). To conserve species whose movements regularly cross national borders, international cooperation is of vital importance (JNCC, 2008k).

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention or CMS) was adopted in Bonn, Germany in 1979 and came into force in 1985 (JNCC, 2008k). Contracting Parties work together to conserve migratory species and their habitats by providing strict protection for endangered migratory species (listed in Appendix 1 of the Convention), concluding multilateral Agreements for the conservation and management of migratory species which require or would benefit from international cooperation (listed in Appendix 2), and by undertaking co-operative research activities (JNCC, 2008k). The UK ratified the Convention in 1985 (JNCC,

2008k). The legal requirement for the strict protection of Appendix I species is provided by the Wildlife & Countryside Act (1981 and as amended).

D. Convention on Trade in Endangered Species of Wild Flora and Fauna

Annually, international wildlife trade is estimated to be worth billions of dollars and to include millions of individual plant and animal specimens (JNCC, 2008l). The trade is diverse, ranging from live animals and plants to a vast array of wildlife products derived from them. An annual import value approaching US$160 billion has been estimated for all wildlife products, including wild-sourced timber and fish products, in the early 1990s (JNCC, 2008l). Levels of exploitation of some animal and plant species are high and the trade in them, together with other factors, such as habitat loss, is capable of heavily depleting their populations and even bringing some species close to extinction. Many wildlife species in trade are not endangered, but the existence of an agreement to ensure the sustainability of the trade is important in order to safeguard these resources for the future. Since the trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international cooperation to safeguard certain species from over-exploitation.

The Convention on Trade in Endangered Species of Wild Flora and Fauna (CITES or the Washington Convention) was adopted in Washington DC, United States of America in March 1973 and entered into force in July 1975 (JNCC, 2008l). CITES aims to regulate international trade in species which are endangered or which may become endangered if their exploitation is not controlled. CITES is implemented within Europe through two EC Regulations (338/97 and 1808/01) (JNCC, 2008l). These Regulations implement CITES in a stricter manner than is required by the Convention. For instance they include certain non-CITES species, and also contain provisions to prohibit or restrict imports of species which are considered to be a threat to native EC flora and fauna.

The UK ratified CITES in August 1976. The Endangered Species (Import & Export) Act 1976 was the first piece of legislation to give effect to CITES. It has been substantially amended and is now largely superseded by the European Regulations (JNCC, 2008l). The Control of Trade in Endangered Species (Enforcement) Regulations 1997 (COTES) make provision for enforcement of the European Regulations (JNCC, 2008l).

E. United Nations Framework Convention on Climate Change

While the world's climate has always varied naturally, the vast majority of scientists now believe that rising concentrations of 'greenhouse gases' in the earth's atmosphere, resulting from economic and demographic growth over the last two centuries since the industrial revolution, are overriding this natural variability and leading to potentially irreversible climate change (JNCC, 2008m). The implications of climate change are far reaching and include rises in sea levels, changes in rainfall patterns (increasing the threat of drought or floods in many regions) and a greater threat of extreme weather events, such as intense storms and heatwaves (JNCC, 2008m). Climate change could, therefore, have potentially dramatic negative impacts on human health, food security, economic activity, water resources, physical infrastructure and global biodiversity.

The United Nations Framework Convention on Climate Change was adopted at the Earth Summit in Rio de Janeiro, Brazil in 1992 and came into force on 1994 (JNCC,

2008m). The Convention set a non-binding goal for Contracting Parties to stabilise their greenhouse emissions to 1990 levels by the year 2000. To this end, Parties were required to undertake necessary measures, including the submission of national inventories of greenhouse-gas emissions and removals, adoption of national programmes for mitigating climate change and developing strategies for adapting to its impacts, and promotion of technology transfer and the sustainable management, conservation, and enhancement of greenhouse gas sinks and 'reservoirs' (such as forests and oceans). In addition, Parties were required to take climate change into account in their relevant social, economic, and environmental policies; cooperate in scientific, technical, and educational matters; and promote education, public awareness, and the exchange of information related to climate change (JNCC, 2008m). However, in 1995 it was acknowledged that the commitment of Parties to take these measures was not adequate to achieve the aims of the Convention. As a result, the Kyoto Protocol was adopted in 1997 to strengthen the obligations of the Convention. Under the Protocol, industrialized countries have a legally binding commitment to reduce their collective greenhouses gas emissions by at least 5% compared to 1990 levels by the period 2008 – 2012.

The UK ratified the Climate Change Convention in 1993 and the Kyoto Protocol in 2002. In November 2000, the UK Government published a national strategy for addressing climate change issues, providing details of how the UK plans to deliver its targets under the Kyoto Protocol (JNCC, 2008m).

F. The Convention for the Protection of the Marine Environment of the North-East Atlantic

During the latter half of the last century deliberate dumping of substances and spillage disasters in the North-East Atlantic highlighted the need for international cooperation to combat marine pollution in this region (JNCC, 2008n). Accordingly, the Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft (the Oslo Convention) was adopted in 1972 to address pollution at sea, while the Convention for the Prevention of Marine Pollution from Land-Based Sources (the Paris Convention) was adopted in 1974 to address marine pollution by discharges of dangerous substances from land-based sources, watercourses or pipelines (JNCC, 2008n).

The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) was adopted in Paris, France in September 1992 and entered into force in March 1998 (JNCC, 2008n). OSPAR replaced both the Oslo and Paris Conventions, with the intention of providing a comprehensive and simplified approach to addressing all sources of pollution which might affect the maritime area, as well as matters relating to the protection of the marine environment other than those relating to the prevention and elimination of pollution. It retained all decisions, recommendations and agreements adopted under the previous Conventions, subject to termination through the adoption of new measures under OSPAR. An OSPAR Commission was established to administer the Convention and to develop policy and international agreements. In July 1998 parties agreed on a new Annex V on the protection and conservation of the ecosystems and biological diversity of the maritime area and a new appendix 3 with criteria for identifying human activities for the purpose of Annex V (JNCC, 2008n). The Commission has adopted five strategies for directing its work. Measures and programmes within the Biodiversity Strategy include the identification of ecological quality objectives of the North Sea, development of lists of species and habitats in need of protection,

identification and selection of marine protected areas, and the prevention and control of adverse impacts from human activities. The UK ratified OSPAR in 1998, and Annex V and Appendix 3 in June 2000 (JNCC, 2008n).

G. The Convention on Wetlands of International Importance especially as Waterfowl Habitat

Wetlands are among the world's most productive environments (JNCC, 2008o). They are cradles of biological diversity, providing the water and primary productivity upon which large numbers of plant and animal species depend for survival. They are also important locations of plant genetic diversity and support large numbers of bird, mammal, reptile, amphibian, fish and invertebrate species (JNCC, 2008o). Wetlands provide tremendous economic benefits through their role in supporting fisheries, agriculture and tourism and through much of the world they have a crucial role as a source of clean water for dependant human populations (JNCC, 2008o). Unfortunately they are also among the world's most threatened ecosystems, owing mainly to continued drainage, pollution, over-exploitation or other unsustainable uses of their resources (JNCC, 2008o).

The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention or Wetlands Convention) was adopted in Ramsar, Iran in February 1971 and entered into force in December 1975 (JNCC, 2008o). The Convention covers all aspects of wetland conservation and wise use. The Convention has three main 'pillars' of activity: the designation of wetlands of international importance as Ramsar sites; the promotion of the wise-use of all wetlands in the territory of each country; and international co-operation with other countries to further the wise-use of wetlands and their resources.

The UK ratified the Convention in 1976. The UK has generally chosen to underpin the designation of its Ramsar sites through prior notification of these areas as Sites of Special Scientific Interest (SSSIs) (or Areas of Special Scientific Interest (ASSIs) in Northern Ireland) (JNCC, 2008o). Accordingly, these receive statutory protection under the Wildlife & Countryside Act (WCA) 1981, and the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 (JNCC, 2008o). In England and Wales, further protection is provided by the Countryside and Rights of Way (CRoW) Act 2000. Government in England and Wales has issued policy statements relating to the special status of Ramsar sites. This extends the same protection at a policy level to listed Ramsar sites in respect of new development as that afforded to sites which have been designated under the EC Birds and Habitats Directives as part of the EU Natura 2000 network (JNCC, 2008o).

H. Council Directive 79/409/EEC on the conservation of wild birds

In 1979, the European Community adopted Council Directive 79/409/EEC on the conservation of wild birds (the 'Birds Directive'), in response to the 1979 Bern Convention on the conservation of European habitats and species (the 'Bern Convention') (JNCC, 2008p). The annexes were amended by the Environment Chapter of the Treaty of Accession 2003. The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It sets broad objectives for a wide range of activities, although the precise legal mechanisms for their achievement are at the discretion of each Member State (in the UK

delivery is via several different statutes). The Directive applies to the UK and to its overseas territory of Gibraltar (JNCC, 2008p).

The main provisions of the Directive include:

- The maintenance of the favourable conservation status of all wild bird species across their distributional range (Article 2) with the encouragement of various activities to that end (Article 3);
- The identification and classification of Special Protection Areas for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance (Article 4) (Together with Special Areas of Conservation (SACs) designated under the Habitats Directive, SPAs form a network of pan-European protected areas known as Natura 2000);
- The establishment of a general scheme of protection for all wild birds (Article 5);
- Restrictions on the sale and keeping of wild birds (Article 6);
- Specification of the conditions under which hunting and falconry can be undertaken (Article 7). (Huntable species are listed on Annex II.1 and Annex II.2 of the Directive);
- Prohibition of large-scale non-selective means of bird killing (Article 8);
- Procedures under which Member States may derogate from the provisions of Articles 5-8 (Article 9) — that is, the conditions under which permission may be given for otherwise prohibited activities;
- Encouragement of certain forms of relevant research (Article 10); and
- Requirements to ensure that introduction of non-native birds do not threatened other biodiversity (Article 11).

A very wide range of other statutory and non-statutory activities also support the Bird Directive's implementation in the UK (JNCC, 2008p), including national bird monitoring schemes, bird conservation research and the UK Biodiversity Action Plan (UKBAP) which involves action for a number of bird species and the habitats which support them.

In the UK, the provisions of the Birds Directive are implemented through the Wildlife & Countryside Act 1981 (as amended) The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), the Wildlife (Northern Ireland) Order 1985, the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 and The Conservation (Natural Habitats, &C.) (Northern Ireland) Regulations 1995 (as amended). The 'Habitats Regulations' apply to the UK land area and its territorial sea (to 12 nautical miles from the coast), and are supported by government policy guidance (JNCC, 2008p).

I. Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora

Within Europe natural habitats are continuing to deteriorate and an increasing number of wild species are seriously threatened, with much of this being as a result of development and agricultural intensification (JNCC, 2008q). The main aim of the EC Habitats Directive is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species at a favourable conservation status, introducing robust protection for those habitats and species of European importance. In applying these measures Member States are required to take

account of economic, social and cultural requirements and regional and local characteristics (JNCC, 2008q).

In 1992 the European Community adopted Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (EC Habitats Directive). This is the means by which the Community meets its obligations as a signatory of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) (JNCC, 2008q). The provisions of the Directive require Member States to introduce a range of measures including the protection of species listed in the Annexes; to undertake surveillance of habitats and species and produce a report every six years on the implementation of the Directive. The 189 habitats listed in Annex I of the Directive and the 788 species listed in Annex II, are to be protected by means of a network of sites. Each Member State is required to prepare and propose a national list of sites for evaluation in order to form a European network of Sites of Community Importance (SCIs). Once adopted, these are designated by Member States as Special Areas of Conservation (SACs), and along with Special Protection Areas (SPAs) classified under the EC Birds Directive, form a network of protected areas known as Natura 2000 (JNCC, 2008q). The Directive was amended in 1997 by a technical adaptation Directive, with the annexes being further amended by the Environment Chapter of the Treaty of Accession 2003.

The Habitats Directive introduces the precautionary principle for the first time to protected areas; that is that projects can only be permitted having ascertained no adverse effect on the integrity of the site for the first time for protected areas,. Projects may still be permitted if there are no alternatives, and there are imperative reasons of overriding public interest. In such cases, compensation measures will be necessary to ensure the overall integrity of network of sites. As a consequence of amendments to the Birds Directive these measures are to be applied to SPAs also. Member States shall also endeavour to encourage the management of features of the landscape to support the Natura 2000 network (JNCC, 2008q).

In the UK the Directive has been transposed into national laws by means of the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended), and the Conservation (Natural Habitats, & c.) Regulations (Northern Ireland) 1995 (as amended), which are known as 'the Habitats Regulations'. Most SACs on land or freshwater areas are underpinned by notification as Sites of Special Scientific Interest (SSSIs) (or as Areas of Special Scientific Interest (ASSIs) in Northern Ireland) (JNCC, 2008q).

J. The Convention Concerning the Protection of the World Cultural and Natural Heritage

The Convention Concerning the Protection of the World Cultural and Natural Heritage (the World Heritage Convention) was adopted in Paris, France in November 1972 and came into force in December 1975, being ratified in the UK in 1984 (JNCC, 2008r). The Convention is a unique international instrument in that it seeks to protect both cultural and natural heritage and defines the kind of sites which can be considered for inscription of the World Heritage List (ancient monuments, museums, biodiversity and geological heritage all come within the scope of the Convention), setting out the duties of States Parties in identifying potential sites and their role in protecting them (JNCC, 2008r). Although many World Heritage sites fall into either the 'cultural' or 'natural' categories, a

particularly important aspect of the Convention is its ability to recognise landscapes that combine these values, and where the biological and physical aspects of landscape have evolved alongside human activity (JNCC, 2008r).

K. Council Directive 76/160/EEC on the Quality of Bathing Water

The main objective of the 1976 EC Bathing Water Directive (76/160/EEC) is to protect public health and the environment from faecal pollution at bathing waters (Defra, 2008a). The Directive requires Member States to identify popular bathing areas and to monitor water quality at these bathing waters throughout the bathing season, which runs from mid May to September in England (Defra, 2008a). The Directive sets a number of microbiological and physico-chemical standards that bathing waters must either comply with ('mandatory' standards) or endeavour to meet ('guideline' standards) (Defra, 2008a).

The mandatory standards used by the European Commission to determine compliance of bathing waters with the Directive are the microbiological parameters - total and faecal coliforms and three physio-chemical parameters - surface active substances, mineral oils and phenols. Cases of non-compliance with the physico-chemical parameters are extremely rare so compliance in the UK each year is normally determined by the extent of pollution by total and faecal coliform bacteria (Defra, 2008a). Meeting the mandatory water quality standards of the Bathing Water Directive is the minimum legal requirement. Mandatory standards are given for 10 parameters: total coliforms, faecal coliforms, salmonella, enteroviruses, pH, colour, mineral oils, surface active substances (detergents), phenols and transparency. The Directive also sets the minimum frequency at which bathing waters should be sampled.

The Bathing Water Directive was initially transposed into national legislation through the Bathing Waters (Classifications) Regulations (SI 1991 No. 1597) and the Bathing Waters (Classifications) (England) Regulations 2003 (SI 2003 No. 1238). A revised Bathing Water Directive (2006/7/EC) came into force in March 2006, with key changes including a tightening of water quality standards and a requirement to provide information about bathing waters to the public on signage on beaches and online. The revised Directive sets 4 new standards of water quality (excellent, good, sufficient and poor) and all bathing waters will be expected to achieve at least the "sufficient" classification by 2015, with limited exceptions (Defra, 2008a). In 2008, there are 414 identified and monitored bathing waters in England, 81 in Wales, 80 in Scotland and 24 in Northern Ireland, making a total of 599 bathing waters across the UK. Of these sites, 587 are coastal waters and 12 are inland freshwater sites (Defra, 2008a).

L. Shellfish Waters Directive (79/923/EC)

The aim of the EC Shellfish Waters Directive is to protect or improve shellfish waters in order to support shellfish life and growth, therefore contributing to the high quality of shellfish products directly edible by man (Defra, 2008b). It sets physical, chemical and microbiological water quality requirements that designated shellfish waters must either comply with ('mandatory' standards) or endeavour to meet ('guideline' standards) (Defra, 2008b). The Directive is designed to protect the aquatic habitat of bivalve and gastropod molluscs, including oysters, mussels, cockles, scallops and clams. It does not cover shellfish crustaceans such as crabs, crayfish and lobsters (Defra, 2008b).

The original Shellfish Waters Directive (79/923/EC), adopted on 30 October 1979, was repealed by the codified Shellfish Waters Directive (2006/113/EC), adopted on 12 December 2006. Codification is a routine procedure that consolidates an existing Directive, with any amendments made since its introduction, into a single, more accessible document (Defra, 2008b). The codified Directive maintains all existing measures which provide for the monitoring and assessment of shellfish waters and the setting of the water quality standards they are required to achieve (Defra, 2008b). The original Shellfish Waters Directive (79/923/EEC) was transposed into UK legislation through the Surface Waters (Shellfish) Classifications Regulations 1997 and the Surface Waters (Shellfish) Directions 1997 (Defra, 2008b).

Defra is committed to improving water quality to a level where all designated shellfish waters can support at least 'class B' production areas (Defra, 2008b). This is regarded as an achievable interim target towards meeting the guideline faecal coliform standard for shellfish flesh quality under the Shellfish Waters Directive, providing significant environmental benefits as well as benefits to the shellfish industry (Defra, 2008b).

The Directive will be repealed in 2013 by the EC Water Framework Directive. When this occurs, the Water Framework Directive must provide at least the same level of protection to shellfish waters (which the WFD classifies as protected areas) as the Shellfish Waters Directive does (Defra, 2008b).

There are currently 98 designated shellfish waters in England, 108 in Scotland, 26 in Wales and 9 in Northern Ireland, a total of 241 shellfish waters in the UK. Shellfish waters are formally designated under the Shellfish Waters Directive through the issue of a Notice and Schedule (Defra, 2008b).

M. Water Framework Directive (2000/60/EC)

Rivers, lakes and coastal waters are vital natural resources, they provide drinking water, crucial habitats for many different types of wildlife and are an important resource for industry and recreation. A significant proportion of them are environmentally damaged or under threat. Protecting and improving the environment is an important part of achieving sustainable development and is vital for the long term health, well being and prosperity of everyone. The new EU Water Framework Directive is a welcome and radical improvement on earlier, piecemeal EU water legislation. It expands the scope of water protection to all waters and sets out clear objectives that must be achieved by specified dates (JNCC, 2008s).

In October 2000 the 'Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy' (EU Water Framework Directive or WFD) was adopted (JNCC, 2008s). The purpose of the Directive is to establish a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. It will ensure all aquatic ecosystems and with regard to their water needs, terrestrial ecosystems and wetlands meet 'good status' by 2015. The Directive requires Member States to establish river basin districts and for each of these a river basin management plan and envisages a cyclical process where river basin management plans are prepared, implemented and reviewed every six years. A key part of the Water Framework Directive, that is central to its successful implementation, is the requirement

to achieve ‘good’ status for most European surface water bodies by 2015. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 were laid before Parliament at the end of 2003. The regulations include (JNCC, 2008s):

- The framework for delivering the Directive’s environmental objectives. The quality of rivers, lakes, estuaries, coastal waters and groundwaters must be protected and enhanced by 2015;
- Wetlands depending on groundwater must be safeguarded and water related requirements of other European Community legislation taken into account;
- Integration into packages of measures and plans based on river basins, which must be drawn up with full public participation;
- The Environment Agency as competent authority for these Regulations has responsibility to:
    - Characterise river basin districts;
    - Identify bodies of water used for the abstraction of drinking water;
    - Prepare, review and keep up to date a register of protected areas for each river basin district;
    - Establish programmes to monitor water status, so as to establish an overview within each river basin district;
    - Prepare and submit to the ‘appropriate authority’ (Secretary of State and/or National Assembly for Wales) environmental objectives for each body of water and programmes of measures; and
    - Prepare and submit to the appropriate authority a river basin management plan for each district (including consultation, publicity and taking account of views) and supplementary plans.

N. Council Directive on Environmental Liability (2004/35/EC)

The Directive is likely to be transposed by December 2008 and seeks to achieve the prevention and remedying of environmental damage - specifically, damage to habitats and species protected by EC law and to species or habitat on a site of special scientific interest for which the site has been notified, damage to water resources and land contamination which presents a threat to human health. It reinforces the “polluter pays” principle - making operators financially liable for threats of or actual damage (Defra, 2008c).

The Directive introduces a number of key features (Defra, 2008c):

- Scope - the Directive does not cover all types of damage to the environment. It only covers ‘environmental damage’ which is one or more of: ‘damage to protected species and natural habitats or in a site of special scientific interest’, ‘damage to water’ and ‘land damage’;
- The Directive introduces two types of liability: fault-based liability in respect of environmental damage to protected species and natural habitats from all other occupational activities and strict liability in respect of environmental damage, caused by a specified range of 'occupational activities' (described in Annex III of the ELD);
- Reporting environmental damage - operators are required to take immediate steps to prevent damage or further damage and to notify the enforcing authority; and

- Role of enforcing authority - the authority must establish if it is 'environmental damage' and identify a responsible operator.

A number of legal systems already exist in the United Kingdom which provide for the remediation of environmental damage. Under these regimes, action is taken in the public interest by public authorities such as local authorities or the Environment Agency. They can require damage to be put right by those responsible for it, or put the damage right themselves and then recover the costs afterwards from those responsible (Defra, 2008c).

The Regulations will supplement existing environmental protection legislation such as the Environmental Protection Act 1990, the Water Resources Act 1991 or the Wildlife and Countryside Act 1981 and the Control of Major Accident Hazards Regulations 1999. Those pieces of legislation will still apply, and to the extent that they impose additional obligations to those in these Regulations, will still need to be complied with (Defra, 2008c).

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Appendix C
Information pertaining to areas of conservation importance on the Essex coast

L14.1 Ramsar sites

Table 1: Qualifying features of the Stour & Orwell Estuaries Ramsar (JNCC, 2008t)

Qualifying features of the Stour & Orwell Estuaries Ramsar (JNCC, 2008t)
Ramsar criterion 2
The site supports seven nationally-scarce plant species and five British Red Data Book invertebrates.
Ramsar criterion 5
The site supports a notable assemblage of wintering wetland birds (63,017 waterfowl – 5yr peak mean).
Ramsar criterion 6
Qualifying species / populations (as identified at designation). ***Species with peak counts in spring/autumn:*** • Common redshank *Tringa totanus totanus*. ***Species with peak counts in winter:*** • Dark-bellied Brent Goose *Branta bernicla bernicla;* • Northern pintail *Anas acuta;* • Grey plover *Pluvialis squatarola;* • Red knot *Calidris canutus islandica;* • Dunlin *Calidris alpina alpina;* • Black-tailed godwit *Limosa limosa islandica; and* • Common redshank *Tringa totanus totanus*.

Table 2: Qualifying features of Hamford Water Ramsar (JNCC, 2008u)

Qualifying features for Hamford Water Ramsar (JNCC, 2008u)
Ramsar criterion 6
Qualifying species / populations (as identified at designation): ***Species with peak counts in spring/autumn:*** • Ringed plover *Charadrius hiaticula;* • Common redshank *Tringa totanus totanus;* ***Species with peak counts in winter:*** • Dark-bellied Brent Goose *Branta bernicla bernicla; and* • Black-tailed godwit *Limosa limosa islandica.*

Table 3: Qualifying features of the Colne Estuary Ramsar (JNCC, 2008v)

Qualifying features for the Colne Estuary Ramsar (JNCC, 2008v)
Ramsar criterion 1
The site is important due to the extent and diversity of saltmarsh present. This site and the four other sites in the Mid-Essex Coast complex include a total of 3,237ha, representing approximately 70% of the saltmarsh habitat in Essex and 7% of the total saltmarsh in Britain.
Ramsar criterion 2
The site supports 12 species of nationally scarce plants and at least 38 British Red Data Book invertebrate species.
Ramsar criterion 3
This site supports a full and representative sequence of saltmarsh plant communities covering the range of variation in Britain.
Ramsar criterion 5
Qualifying species / populations (as identified at designation): ***Species with peak counts in winter:***

Qualifying features for the Colne Estuary Ramsar (JNCC, 2008v)
32,041 waterfowl (5yr peak mean)
Ramsar criterion 6
Qualifying species / populations (as identified at designation): ***Species with peak counts in winter:*** • Dark-bellied Brent goose *Branta bernicla bernicla*; and • Common redshank *Tringa totanus totanus*.

Table 4: Qualifying features of the Crouch & Roach Estuaries Ramsar (JNCC, 2008w)

Qualifying features for the Crouch & Roach Estuaries Ramsar (JNCC, 2008w)
Ramsar criterion 5
Qualifying species / populations (as identified at designation): ***Species with peak counts in winter:*** 32,867 waterfowl (5yr peak mean)
Ramsar criterion 6
Qualifying species / populations (as identified at designation): ***Species with peak counts in spring/autumn:*** • Dark-bellied Brent goose *Branta bernicla bernicla*. *Species with peak counts in winter:* • Grey plover *Pluvialis squatarola;* • Red knot *Calidris canutus islandica.*

Table 5: Qualifying features of the Blackwater Estuary Ramsar (JNCC, 2008x)

Qualifying features for the Blackwater Estuary Ramsar (JNCC, 2008x)
Ramsar criterion 1
This site, and the four others in the Mid-Essex Coast complex, includes a total of 3,237ha that represent 70% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain.
Ramsar criterion 2
The site is home to at least 16 British Red Data Book species.
Ramsar criterion 3
This site supports a full and representative sequence of saltmarsh plant communities covering the range of variation in Britain.
Ramsar criterion 5
Qualifying species / populations (as identified at designation): ***Species with peak counts in winter:*** *105,061 waterfowl (5yr peak mean)*
Ramsar criterion 6
Qualifying species / populations (as identified at designation): ***Species with peak counts in winter:*** • Dark-bellied Brent goose *Branta bernicla bernicla*; • Black-tailed godwit *Limosa limosa islandica;* • Grey plover *Pluvialis squatarola; and* • Dunlin *Calidris alpina alpina*.

Table 6: Qualifying features of the Dengie Ramsar (JNCC, 2008y)

Qualifying features for the Dengie Ramsar (JNCC, 2008y)
Ramsar criterion 1
This site, and the four others in the Mid-Essex Coast complex, includes a total of 3,237ha that represent 70% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain.
Ramsar criterion 2
The site supports a number of rare plant and animal species including 11 nationally scarce plants and three British Red Data Book species.
Ramsar criterion 3
This site supports a full and representative sequence of saltmarsh plant communities covering the range of variation in Britain.
Ramsar criterion 5
Qualifying species / populations (as identified at designation): ***Species with peak counts in winter:*** 43,828 waterfowl (5yr peak mean)
Ramsar criterion 6
Qualifying species / populations (as identified at designation): ***Species with peak counts in winter:*** • Dark-bellied Brent goose *Branta bernicla bernicla*; • Grey plover *Pluvialis squatarola; and* • Red knot *Calidris canutus islandica.*

Table 7: Qualifying features of the Foulness Ramsar (JNCC, 2008z)

Qualifying features for the Foulness Ramsar (JNCC, 2008z)
Ramsar criterion 1
This site, and the four others in the Mid-Essex Coast complex, includes a total of 3,237ha that represent 70% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain.
Ramsar criterion 2
The site supports a number of nationally-rare and nationally-scarce plant species, and British Red Data Book invertebrates.
Ramsar criterion 3
This site supports a full and representative sequence of saltmarsh plant communities covering the range of variation in Britain.
Ramsar criterion 5
Qualifying species / populations (as identified at designation): ***Species with peak counts in winter:*** 82,148 waterfowl (5yr peak mean)
Ramsar criterion 6
Qualifying species / populations (as identified at designation): ***Species with peak counts in spring/autumn:*** • Common redshank *Tringa totanus totanus.* *Species with peak counts in winter:* • Dark-bellied Brent goose *Branta bernicla bernicla*; • Eurasian oystercatcher *Haematopus ostralegus ostralegus*; • Grey plover *Pluvialis squatarola;* • Bar-tailed Godwit *Limosa lapponica lapponica; and* • Red knot *Calidris canutus islandica.*

Table 8: Qualifying features of the Benfleet and Southend Marshes Ramsar (JNCC, 2008aa)

Qualifying features for the Benfleet and Southend Marshes Ramsar (JNCC, 2008aa)
Ramsar criterion 5
Qualifying species / populations (as identified at designation): ***Species with peak counts in winter:*** 32,867 waterfowl (5yr peak mean)
Ramsar criterion 6
Qualifying species / populations (as identified at designation): ***Species with peak counts in spring/autumn:*** • Dark-bellied Brent goose *Branta bernicla bernicla*. *Species with peak counts in winter:* • Grey plover *Pluvialis squatarola;* • Red knot *Calidris canutus islandica.*

Table 9: Qualifying features of the Abberton Reservoir Ramsar (JNCC, 2008ab)

Qualifying features of the Abberton Reservoir Ramsar (JNCC, 2008ab)
Ramsar criterion 5
The site supports a notable assemblage of wetland over-wintering birds (23,787 waterfowl – 5 yr peak mean 1998/99-2002/2003).
Ramsar criterion 6
Qualifying species / populations (as identified at designation). ***Species with peak counts in spring/autumn:*** • Gadwall *Anas strepera strepera; and* • Northern shoveler *Anas clypeata.* ***Species with peak counts in winter:*** • Eurasian wigeon *Anas Penelope.*

2. Special Areas of Conservation (SAC)

Table 10 : Qualifying features of Essex Estuaries SAC site (JNCC, 2008ac)

Qualifying features for the Essex Estuaries SAC site (JNCC, 2008ac)	
Qualifying feature	**Description**
Annex I habitats that are a primary reason for selection of this site	
Estuaries	
Mudflats and sandflats not covered by seawater at low tide	
Salicornia and other annuals colonising sand and mud	
Spartina swards (*Spartinion maritimae*)	
Atlantic salt meadows (*Glauco-Puccinelletalia maritimae*)	
Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	
Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site	
Sandbanks which are slightly covered by seawater all the time	

3. Special Protection Areas (SPA)

Table 11: Qualifying features of the Stour & Orwell Estuaries SPA (JNCC, 2008ad)

Qualifying features for the Stour & Orwell Estuaries SPA (JNCC, 2008ad)
Article 4.1 Qualification (79/409/EEC)
During the breeding season the area regularly supports: • Avocet *Recurvirostra avosetta*;
Article 4.2 Qualification (79/409/EEC)
Over winter the area regularly supports: • Redshank *Tringa totanus*. • Pintail *Anas acuta*; • Dark-bellied Brent goose *Branta bernicla bernicla*; • Dunlin *Calidris alpina alpina*; • Black-tailed godwit *Limosa limosa islandica;* • Grey plover *Pluvialis squatarola; and* • Knot *Calidris canuta*.

Table 12: Qualifying features of the Hamford Water SPA (JNCC, 2008ae)

Qualifying features of the Hamford Water SPA (JNCC, 2008ae)
Article 4.1 Qualification (79/409/EEC)
During the breeding season the area regularly supports: • Little tern *Sterna albifrons*.
Article 4.2 Qualification (79/409/EEC)
Over winter the area regularly supports: • Common teal *Anas crecca;* • Dark-bellied Brent goose *Branta bernicla bernicla*; • Ringed plover *Charadrius hiaticula;* • Black-tailed godwit *Limosa limosa islandica;* • Grey plover *Pluvialis squatarola;* • Shelduck *Tadorna tadorna*; and • Redshank *Tringa totanus.*

Table 13: Qualifying features of the Colne Estuary SPA (JNCC, 2008af)

Qualifying features of the Colne Estuary SPA (JNCC, 2008af)
Article 4.1 Qualification (79/409/EEC)
During the breeding season the area regularly supports: • Little tern *Sterna albrifrons.* ***Over winter the area regularly supports:*** • Hen harrier *Circus cyaneus*;
Article 4.2 Qualification (79/409/EEC)
During the breeding season the area regularly supports: • Common pochard *Aythya farina; and* • Ringed plover *Charadrius hiaticula.* ***Over winter the area regularly supports:*** • Dark-bellied Brent goose *Branta bernicla bernicla*; and • Redshank *Tringa totanus.*
Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds

Qualifying features of the Colne Estuary SPA (JNCC, 2008af)
Over winter the area regularly supports:
38,600 wildfowl (5 year peak mean 01/04/1998) including Dark-bellied Brent goose *Branta bernicla bernicla* and Redshank *Tringa Totanus*

Table 17: Qualifying features of the Crouch and Roach estuaries SPA (JNCC, 2008ag)

Qualifying features of the Crouch and Roach estuaries SPA (JNCC, 2008ag)
Article 4.1 Qualification (79/409/EEC)
Over winter the area regularly supports:
• Hen Harrier *Circus cyaneus*.
Article 4.2 Qualification (79/409/EEC)
Over winter the area regularly supports:
• Dark-bellied Brent goose *Branta bernicla bernicla*
Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds
18,607 waterfowl (5 year peak mean 30/06/1999) including Dark-bellied Brent goose *Branta bernicla bernicla*.

Table 15: Qualifying features of the Blackwater Estuary SPA (JNCC, 2008ah)

Qualifying features of the Blackwater Estuary SPA (JNCC, 2008ah)
Article 4.1 Qualification (79/409/EEC)
During the breeding season the area regularly supports:
• Little tern *Sterna albifrons.*
Over winter the area regularly supports:
• Hen harrier *Circus cyaneus*.
Article 4.2 Qualification (79/409/EEC)
During the breeding season the area regularly supports:
• Common Pochard *Aythya farina;*
• Ringed plover *Charadrius hiaticula;*
Over winter the area regularly supports:
• Dunlin *Calidris alpina alpina*;
• Ringed plover *Charadrius hiaticula;*
• Black-tailed godwit *Limosa limosa islandica;*
• Grey plover *Pluvialis squatarola; and*
• Dark-bellied Brent goose *Branta bernicla bernicla.*
Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds
Over winter the area regularly supports:
109,964 waterfowl (5 year peak mean 01/04/1998) including Dark-bellied Brent goose *Branta bernicla bernicla,* Ringed plover *Charadrius hiaticula;* Grey plover *Pluvialis squatarola,* Dunlin *Calidris alpina alpine* and Black-tailed godwit *Limosa limosa islandica.*

Table 16: Qualifying features of the Dengie SPA (JNCC, 2008ai)

Qualifying features of the Dengie SPA (JNCC, 2008ai)
Article 4.1 Qualification (79/409/EEC)
Over winter the area regularly supports:
• Hen Harrier *Circus cyaneus*.
Article 4.2 Qualification (79/409/EEC)

Qualifying features of the Dengie SPA (JNCC, 2008ai)
Over winter the area regularly supports: • Dark-bellied Brent goose *Branta bernicla bernicla;* • Knot *Calidris canuta*; and • Grey plover *Pluvialis squatarola.*
Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds
Over winter the area regularly supports: 31,454 waterfowl (5 year peak mean 01/04/1998) including Dark-bellied Brent goose *Branta bernicla bernicla,* Knot *Calidris canuta* and Grey plover *Pluvialis squatarola.*

Table 18: Qualifying features of the Foulness SPA (JNCC, 2008aj)

Qualifying features of the Foulness SPA (JNCC, 2008aj)
Article 4.1 Qualification (79/409/EEC)
During the breeding season the area regularly supports: • Avocet *Recurvirostra avosetta*; • Little tern *Sterna albrifrons*; • Common tern *Sterna hirundo*; and • Sandwich tern *Sterna sandvicensis*. ***Over winter the area regularly supports;*** • Hen Harrier *Circus cyaneus*; • Bar-tailed godwit *Limosa lapponica*; and • Avocet *Recurvirostra avosetta.*
Article 4.2 Qualification (79/409/EEC)
During the breeding season the area regularly supports: • Ringed plover Charadrius hiaticula; ***Over winter the area regularly supports:*** • Dark-bellied Brent goose *Branta bernicla bernicla*; • Knot *Calidris canutus*; • Oystercatcher *Haemotopus ostralegus*; • Grey plover *Pluvialis squatarola;* • Redshank *Tringa totanus*.
Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds
Over winter the area regularly supports: 107,999 waterfowl (5 year peak mean 01/04/1998)

Table 19: Qualifying features of the Benfleet and Southend Marshes SPA (JNCC, 2008ak)

Qualifying features of the Benfleet and Southend Marshes SPA (JNCC, 2008ak)
Article 4.2 Qualification (79/409/EEC)
Over winter the area regularly supports; • Dark-bellied Brent goose *Branta bernicla bernicla*; • Dunlin *Calidris alpina alpina*; • Knot *Calidris canutus*; • Ringed plover *Charadrius hiaticula; and* • Grey plover *Pluvialis squatarola*.
Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds
Over winter the area regularly supports: 34,789 waterfowl (5 year peak mean 30/06/1999)

Table 14: Qualifying features of the Abberton Reservoir SPA (JNCC, 2008al)

Qualifying features of the Abberton Reservoir SPA (JNCC, 2008al)
Article 4.2 Qualification (79/409/EEC)
During the breeding season the area regularly supports:
• Great Cormorant *Phalacrocorax carbo.*
Over winter the area regularly supports:
• Common teal *Anas crecca;*
• Common Pochard *Aythya farina;*
• Northern shoveler *Anas clypeata*;
• Eurasian wigeon *Anas Penelope;*
• Gadwall *Anas strepera;*
• Tufted Duck *Aythya fuligula;*
• Common goldeneye *Bucephala clangula;*
• Eurasian Coot *Fulica Atra; and*
• Great crested grebe *Podiceps cristatus*.
Over winter the area regularly supports 39,763 waterfowl (5yr peak mean 01/04/1998).

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Appendix D
Further baseline information

L15 CHARACTERISATION OF LAND USE AND ENVIRONMENT

L15.1 Unit 1 - Little Oakley to Landguard Point

Primary area of search

This frontage covers the estuaries of the River Stour up to Stratford St Mary and the River Orwell up to Ipswich. Most of the land surrounding the estuaries falls outside the 1 in 1000 year flood risk zone and where this is the case there are no man-made defences.

Notable exceptions are the ports of Harwich and Felixstowe that have substantial economic value from passenger ferry services and cargo shipping. The ports are protected by a variety of defences. Parts of Ipswich are also within the flood risk zone, with numerous marinas along the River Orwell that have both recreational and economic value. Harwich also gives recreational value through a golf club, its museums and sites of historic importance.

The Stour and Orwell Estuaries are of international importance, comprising extensive mudflats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. It provides habitats for an important assemblage of wetland birds and internationally important numbers of wintering and passage wildfowl and waders. The site also holds several nationally scarce plants and British Red Data Book invertebrates.

The Cattawade Marshes SSSI lies at the head of the Stour Estuary and is situated between the freshwater and tidal channels of the River Stour. These grazing marshes with associated their open water and fen habitats are of major importance for the diversity of their breeding bird community, which includes species that have become uncommon throughout lowland Britain as a result of habitat loss.

The Harwich Foreshore SSSI yields the only fossil flora attributable to the lowest division of the Eocene London Clay. Its composition is typical of the formation and specimens are abundant. Association of the plants with ash bands within the Clay may aid correlations elsewhere in the basin since they form useful marker horizons. This is a recently discovered site with great research potential.

L15.2 Unit 2 - Walton-on-the-Naze to Little Oakley

Primary area of search

The land associated with this frontage in the 1 in 1000 yr flood risk zone includes the islands and the low lying land surrounding Hamford Water. The defences comprise revetments and sea banks except for sections where natural defences are present.

There are no significant settlements within the flood zone; however, some properties do lie within the zone around the periphery of Hamford Water. The B1414 crosses the flood zone at Beaumont Key and the B1043 is at risk near Kirby-le-Soken. Titchmarsh Marina also provides recreational and economic value.

Hamford Water National Nature Reserve, Ramsar and SSSI site is a large, shallow estuarine basin comprising tidal creeks and islands, intertidal mud and sand flats, and

saltmarsh supporting rare plants and internationally important species/populations of migratory waterfowl. The site is of international importance for breeding Little Terns and wintering nark-bellied Brent Geese, wildfowl and waders and of national importance for many other bird species. It also supports communities of coastal plants which are rare or extremely local in Britain, including Hog's Fennel, *Peucedanum officinale* which is found elsewhere only in Kent.

L15.3 Unit 3 - Colne Point to Walton-on-the-Naze

Area of search

There is less low lying land within this frontage than most of the other frontages, with the exceptions being St Osyth Marsh, Seawick, Holland Haven Marshes and part of Walton-On-The-Naze. These areas are predominantly protected by a combination of revetments and sea banks. The large settlements of Clacton-On-Sea and Frinton-On-Sea are protected by a variety of defences, primarily sea walls and groynes, although are mostly above the 1 in 1000 year flood zone.

St Osyth Marsh comprises drained agricultural land, protected by a revetment, with the settlements of Seawick and Jaywick to the east including a substantial caravan park which is at risk of flooding. Jaywick Golf Club provides local recreational value and falls within the 1 in 1000 year flood zone, which also includes parts of Clacton Cliffs and Foreshore SSSI. The foreshore and cliff exposures and excavations in the Clacton district have provided opportunities for the study of one of the most important Pleistocene interglacial deposits in Britain, while the Holland-on-Sea Cliffs SSSI represents a stratigraphic site of considerable importance. These sites can be precisely attributed to the Anglian glaciation, providing a fixed dating point within the terrace sequence of the eastern London Basin and a means of correlation with sequences where the Anglian is represented elsewhere in southern Britain and on the continent.

The seafront at Clacton-On-Sea has important recreational and tourism value with attractions including the beach and pier. Walton-On-The-Naze is another important tourist destination with its frontage and pier. Although the majority of these settlements are above the flood risk zone they are at risk from coastal erosion and as such heavily defended.

Holland Haven Marshes SSSI represents an outstanding example of a freshwater to brackish water transition and includes a number of nationally and locally scarce species. Holland Haven Country Park situated on the floodplain of Holland Brook is important both for conservation and recreational value. Part of Walton-On-The-Naze is also within the flood zone, with several buildings and a caravan site at risk. There are several Martello Towers along this part of the coast, which are small defensive forts built in the 19th century and which are of historical significance.

L15.4 Unit 4 - East Mersea to Colne Point

Area of search

This frontage comprises the low lying land of the Colne Estuary, which has flood defences along the majority of the frontage. Between Colne Point and Sandy Point, a revetment protects the agricultural land of St Oysth Marsh. At Point Clear, a large caravan site lies within the 1 in 1000 year flood zone in addition to another Martello Tower, an associated battery and a museum, all of which is protected by a revetment. These features give this location significant value as a tourist destination. The camping and caravan site at Brightlingsea also provides amenity and tourist value.

The majority of the land within the 1 in 1000 flood zone lies within the river flood plain and agricultural areas and are protected by various defences. The flood zone extends into central Colchester where numerous buildings located by the river are at risk from flooding along with several roads and the railway. Colchester is protected by a variety of defences including sea walls. The Wick Marsh - Langenhoe Marsh - Fingringhoe Marsh area has military importance as a Ministry of Defence firing range and is also within the flood risk zone.

The Colne Estuary Ramsar, SAC, SPA, SSSI and NNR is of international importance for wintering Brent Geese and Black-tailed Godwit and of national importance for breeding Little Terns and five other species of wintering waders and wildfowl. The variety of habitats which include mudflat, saltmarsh, grazing marsh, sand and shingle spits, disused gravel pits and reed beds, support outstanding assemblages of invertebrates and plants. Two areas of foreshore at East Mersea are of geological importance, while Colne Point and St. Osyth Marsh are of geomorphological interest.

L15.5 Unit 5 - Sales Point to East Mersea

Area of search

This unit covers the low lying land surrounding the Blackwater Estuary extending inland to Maldon. Defences are for the most part revetments and sea banks, except for sections of sea wall around Maldon and at a few other locations.

The area within the 1 in 1000 year flood zone is for the most part agricultural land with sporadic farm buildings. There is however several settlements incorporated in this zone; St Lawrence, Maryland, Marylandsea, parts of Maldon and Goldhanger. Sections of several B-Roads along with numerous minor roads are also included throughout the flood zone. The campsites at St Lawrence, Maryland Creek and Vaulty Manor provide amenity value. There are several marinas in the estuary that have recreational, amenity and economic value. The site of the Battle of Maldon and National Trust Property is a valuable tourist attraction.

Bradwell Nuclear Power Station is currently being decommissioned but there are plans for a new development on the site, inundation or undermining of this site would cause numerous issues.

Blackwater Estuary NNR and SSSI is the largest estuary in Essex north of the Thames and, is one of the largest estuarine complexes in East Anglia. The mudflats, fringed by saltmarsh on the upper shores support internationally and nationally important numbers of overwintering waterfowl. Shingle and shell banks and offshore islands are also a feature of the tidal flats. The surrounding terrestrial habitats; the sea wall, ancient grazing marsh and its associated fleet and ditch systems, plus semi-improved grassland are also of high conservation interest. This rich mosaic of habitats supports an outstanding assemblage of nationally scarce plants and a nationally important assemblage of rare invertebrates.

Northerney Island Nature Reserve (National Trust), Ray Island Nature Reserve (National Trust) and several other local nature reserves further highlights the conservation value of much of the flood risk zone.

L15.6 Unit 6 – Holliwell Point (North) to Sales Point

Area of search

Within this frontage the 1 in 1000 year flood zone is quite extensive and defences extend along its entire length, consisting of a revetment along the majority of the frontage except for the stretch in the vicinity of St Peter's Chapel. The flood zone is almost exclusively drained agricultural land with sporadic farm buildings and some minor roads as well as the Dengie and Bradwell Marshes. Othona Roman Fort, a Saxon Shorefort and St Peters Chapel have important value historically and as tourist attractions.

The Dengie NNR, Ramsar, SPA and SSSI saltmarsh is the largest continuous example of its type in Essex. The foreshore, saltmarsh and beaches support an outstanding assemblage of rare coastal flora and internationally and nationally important wintering populations of wildfowl and waders, as well as supporting a range of breeding coastal birds in summer. Bradwell Cockle Spit Nature Reserve consists of saltmarsh and shellbank habitats which support numerous species of breeding bird species.

L15.7 Unit 7 – Courtsend/Foulness Point to Holliwell Point (North)

Area of search

Within this unit, the land within the 1 in 1000 year flood zone includes the low lying areas surrounding the Roach and Crouch Estuaries, with the southern section of the flood zone overlapping with that of Frontage H. The flood defences are typical of the region, with the majority being revetments and sea banks with small sections of sea wall. More substantial defences are present around the larger settlements such as South Woodham Ferrers and Rochford.

The settlements within the flood zone include parts of Rochford, South Woodham Ferrers and Burnham-On-Crouch. Infrastructure located within the flood zone includes several minor roads and the railway line between Woodham Ferrers and Burnham-On-Crouch, along with the station at Althorne.

The marinas at Burnham-On-Crouch, Althorne and North Fambridge provide recreational and economical value, along with the campsites around Burnham-On-Crouch. Foulness and Potton Islands have significant military importance as firing ranges for the Ministry of Defence

The Crouch and Roach Estuaries Ramsar, SPA and SSSI site is of international importance for avian species, with additional interest being provided by the aquatic and terrestrial invertebrates and an outstanding assemblage of nationally scarce plants.

L15.8 Unit 8 – North Shoebury to Courtsend / Foulness Point

L15.9 Area of search

This land in this unit is low lying and overlaps with the 1 in 1000 year flood zone of Frontage G. The defences are continuous and mostly in the form of revetments or sea bank, except for a stretch of sea wall at North Shoebury.

The majority of the flood zone includes the Ministry of Defence controlled firing ranges on Havengore and Foulness Islands, which extend offshore onto Maplin Sands and have significant military importance. The area numerous associated buildings including the hamlets of Churchend and Courtsend which are at below the 1 in 1000 year flood level. The Broomway pubic right of way across Maplin Sands has important amenity value

Foulness Ramsar, SPA and SSSI is part of an open coast estuarine system comprising grazing marsh, saltmarsh, intertidal mudflats and sandflats which support nationally rare and nationally scarce plants, and nationally and internationally important populations of breeding, migratory and wintering waterfowl

L15.10 Unit 9 – Two-Tree Island to North Shoebury

Area of search

The land in the 1 in 1000 year flood zone in this area is fairly limited comprising small sections of the seafront of Southend-On-Sea. There are a variety of defences including sea walls, groynes and revetments.

Some properties lie within the 1 in 1000 year flood zone at Shoeburyness, South church and small areas of the seafront at Southend. Sections of the B1016 and the railway line at Leigh-On-Sea are within the flood zone. The golf course at Southchurch provides recreational value. The seafront at Southend-On-Sea has important recreational and tourism value with its attractions including the beach, pier, aquarium and museum, while Shoeburyness has military importance as a Ministry of Defence firing range.

Benfleet and Southend SSSI comprise an extensive series of salt marshes, mudflats, scrub and grassland which support a diverse flora and fauna. The south-facing slopes of the downs, composed of London Clay capped by sand, represent the line of former river cliffs with several re-entrant valleys.

Appendix E
Consideration of the Potential Effects of SMP Policy on Environmental Receptors

Potential positive effects of SMP policy on SEA Environmental Receptors

SMP OPTION	POSITIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON S1 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
Hold the line (HTL)	Protection of communities and infrastructure located within the coastal flood zone;	The SMP is not considered likely to have any effect on parameters for air quality.	The protection of water abstraction sources	The protection of agricultural land	Protection of key features in the coastal landscape	Protection of key historical assets			Protection of key community assets
	Protection of habitat landward of defences;			The protection of soil as an integral element of habitat	Protection of key features in the coastal landscape		Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	
	Protects freshwater resources (e.g. abstractions & boreholes);		The protection of water abstraction sources	The prevention of salinisation of soils					Protection of key community assets
	Provides stability to areas of coastline, within a wider management context;				Provision of a natural and dynamic coastal landscape		Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	Protection of key community assets
	Protects economic assets located behind defences; and					Protection of key historical assets			Protection of key community assets
	Provides protection to ecological, cultural and historical assets landward of the defences.				Protection of key features in the coastal landscape	Protection of key historical assets	Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	Protection of key community assets
Advance the line (ATL)	Provides additional space for communities;			May provide for increased areas of agricultural land					Provides opportunity to increase area of land available for coastal communities
	Protection of communities and infrastructure located within the coastal flood zone;			The protection of agricultural land	Protection of key features in the coastal landscape				Protection of key community assets
	Protection of habitat landward of defences;			The protection of soil as an integral element of habitat			Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	
	Protects freshwater resources (e.g. abstractions & boreholes);		The protection of water abstraction sources						Protection of key community assets
	Protects economic assets located behind defences; and			The protection of agricultural land		Protection of key historical assets			Protection of key community assets
	Provides protection to ecological, cultural and historical assets landward of the defences.				Protection of key features in the coastal landscape	Protection of key historical assets	Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	Protection of key community assets
Managed realignment (MR)	Coastal habitats allowed to move landwards under rising sea levels				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Creation of habitat to aid UKBAP; (United Kingdom Biodiversity Action Plan) and local BAP (Biodiversity Action Plan) targets;				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	

SMP OPTION	POSITIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON S1 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
	Habitat created for juvenile fish and other aquatic organisms (benefits to environment and fishing communities);						Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	Protects the viability of commercial and recreational fishing
	Reduces flood risk;								Protection of key community assets
	Promotes natural coastal processes;		May lead to enhanced water quality		Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Contributes towards a more natural management of the coast; and		May lead to enhanced water quality		Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Creation of high tide roosts and feeding areas.				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
No active intervention (NAI)	Coastal habitats allowed to move landwards under rising sea levels;				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Promotes natural coastal processes; and		May lead to enhanced water quality		Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Contributes towards a more natural management of the coast.				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	

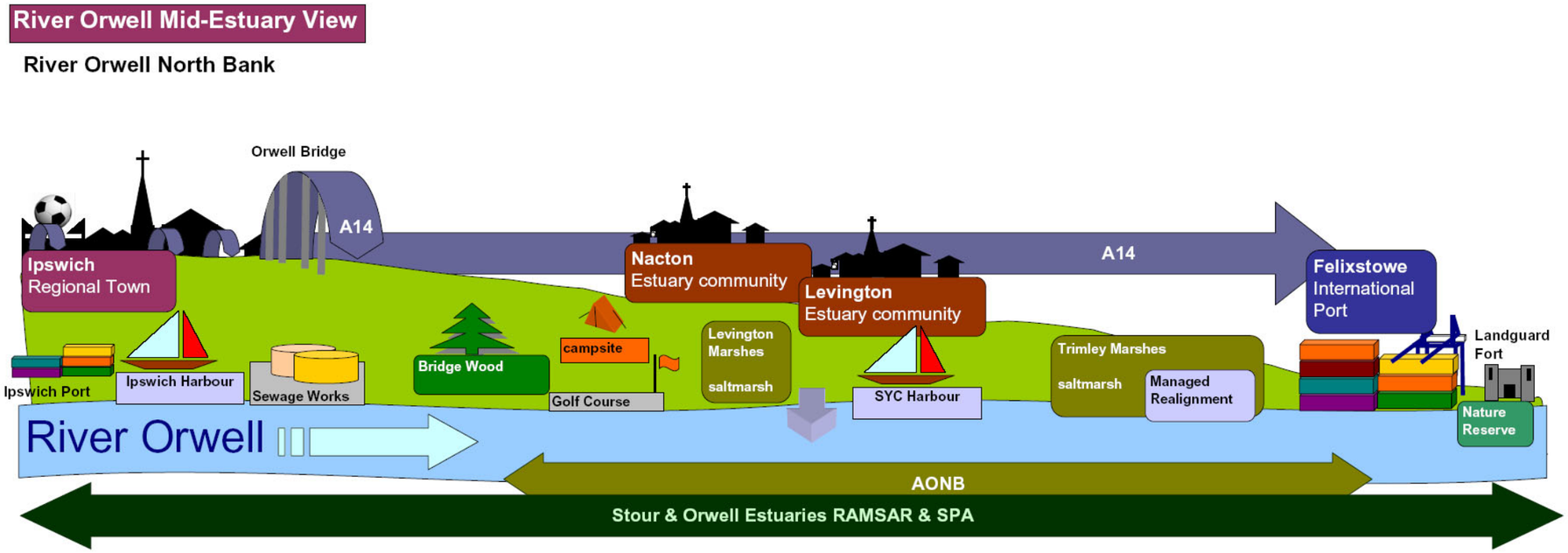
Potential negative effects of SMP Policy on SEA Environmental Receptors

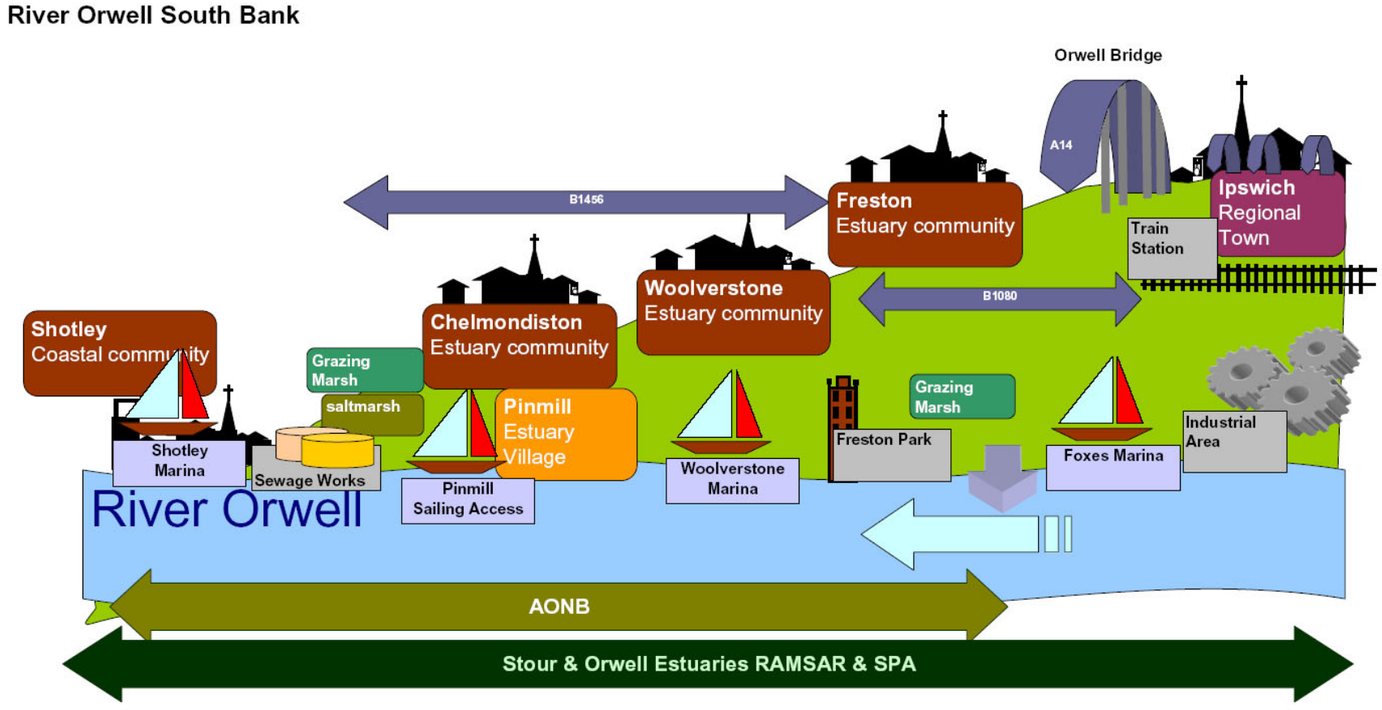
SMP OPTION	NEGATIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON SI 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
Hold the line (HTL)	Coastal squeeze (loss of habitat);	**The SMP is not considered likely to have any effect on parameters for air quality or climatic factors.**			Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Interruption of coastal processes;		Adverse effects on water quality through turbidity changes etc.		Reduction in the dynamic quality of the coastal landscape		Shifts in habitat composition or function	Reduction in abundance and diversity of species	
	May increase flood and coastal erosion risk elsewhere;			Potential degradation of soil quality through intrusion		Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Increased risk to existing community features
	Promotes unsustainable land use practices with the coastal flood zone;								Impacts on sustainability of communities
	Diverts limited resources away from an adaptation response to rising sea levels; and					Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Effects on the resourcing of other community related activities
	Requires ongoing commitment to future investment in maintenance and improvement.				Introduction of defence features into the area which detract from the coastal landscape	Need for expenditure on site investigation prior to loss through inundation			Potential impacts of expenditure on flood defence and the knock on effects of this to other areas of public and private expenditure
Advance the line (ATL)	Reduction in extent of coastal habitat;				Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Change in functionality of habitat;						Shifts in habitat functionality	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Increased coastal squeeze;				Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Interruption of coastal processes;		Adverse effects on water quality through turbidity changes etc.				Shifts in habitat functionality	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Effect on marine habitat;						Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the

SMP OPTION	NEGATIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON SI 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
									community
	May increase rate of coastal erosion either side of the advanced line.		Adverse effects on water quality through turbidity changes etc.	Potential degradation of soil quality through intrusion	Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Impacts on other features important for community purposes
Managed realignment (MR)	Reduction in extent of habitat landwards of defences;				Shifts in the habitat mosaic as a function of the local landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Change in nature of habitat to landward of defence;				Shifts in the habitat mosaic as a function of the local landscape		Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Impact upon aquifers and abstractions;		Loss of abstraction points and intrusion into aquifers						Impacts on water supply to communities
	Loss of communities or community assets; and		Loss of abstraction points and intrusion into aquifers	Potential degradation of soil quality through intrusion		Loss of heritage features			Reduction in the amenity of coastal communities
	Loss of heritage and cultural features;					Loss of heritage features			Reduction in the amenity of coastal communities
	Loss of agricultural land			Loss of agricultural land/soil					Impacts on the character of local communities and the local economy
No active intervention (NAI)	Lack of certainly of effects and time for adaptation;						Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Provision of community features in unsustainable locations
	Increased risk of inundation to landward habitats under rising sea levels;					Loss of known or undiscovered archaeological resources	Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Impact upon aquifers and abstractions;		Loss of abstraction points and intrusion into aquifers						Impacts on water supply to communities
	Loss of communities or community assets; and		Loss of abstraction points and intrusion into aquifers	Loss of agricultural land/soil		Loss of heritage features			Reduction in the amenity of coastal communities
	Loss of heritage and cultural features.					Loss of heritage features			Reduction in the amenity of coastal communities

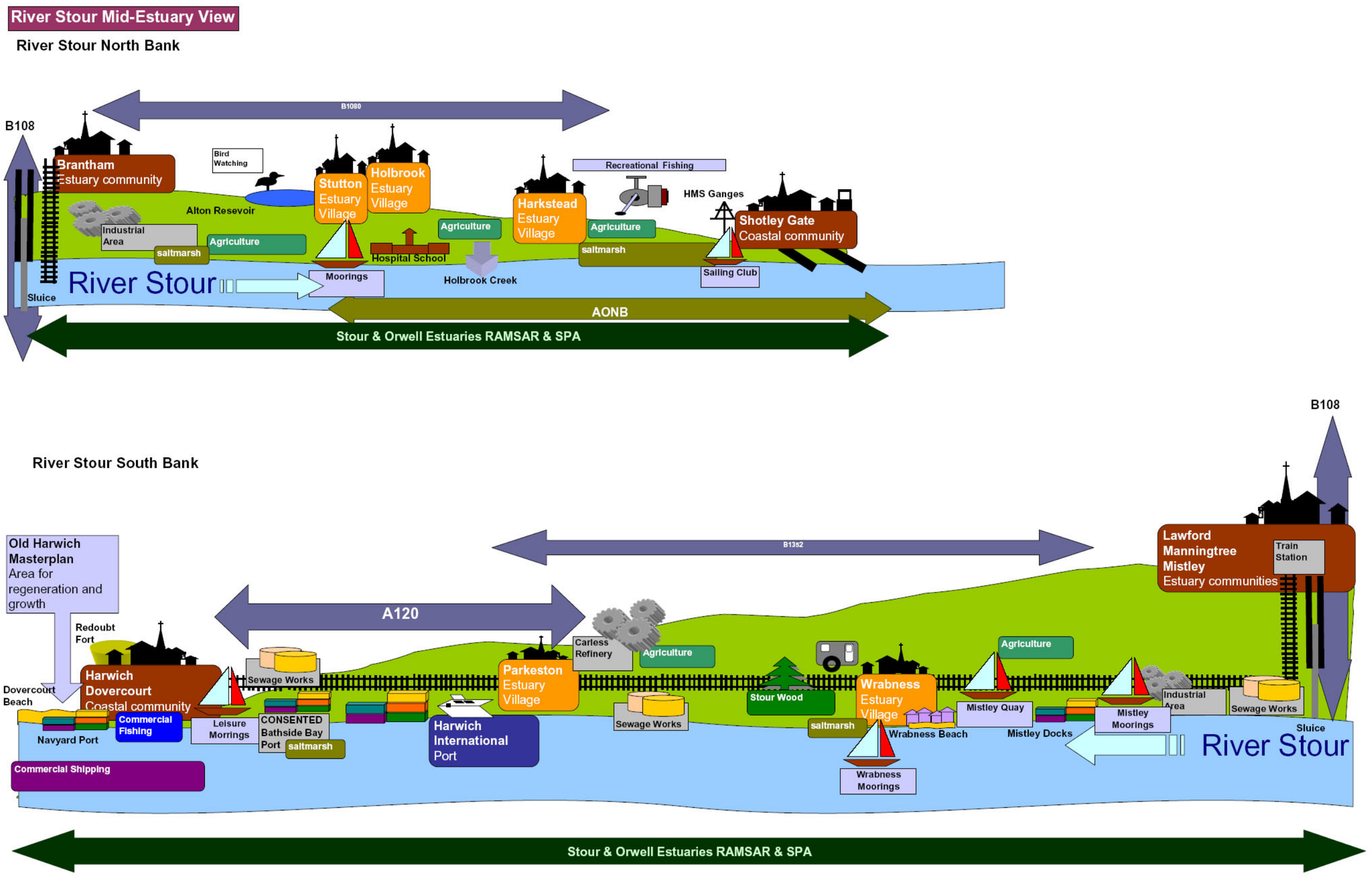
Appendix F
Cross Section Diagrams

Cross-sectional representation of River Orwell





Cross-sectional representation of River Stour



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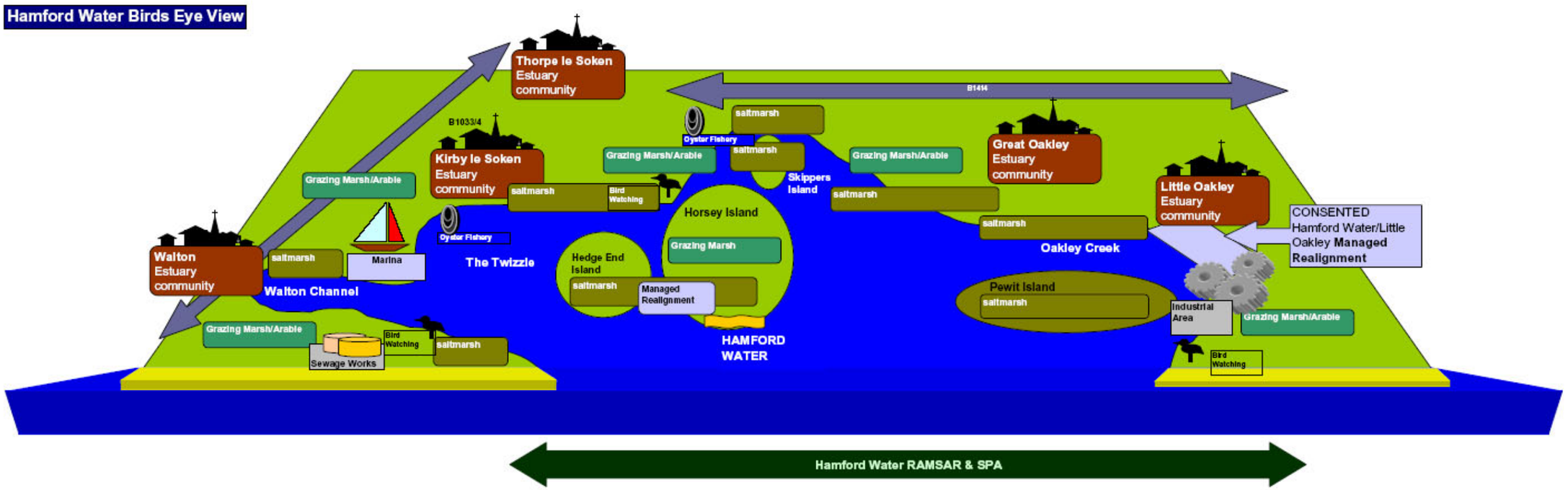
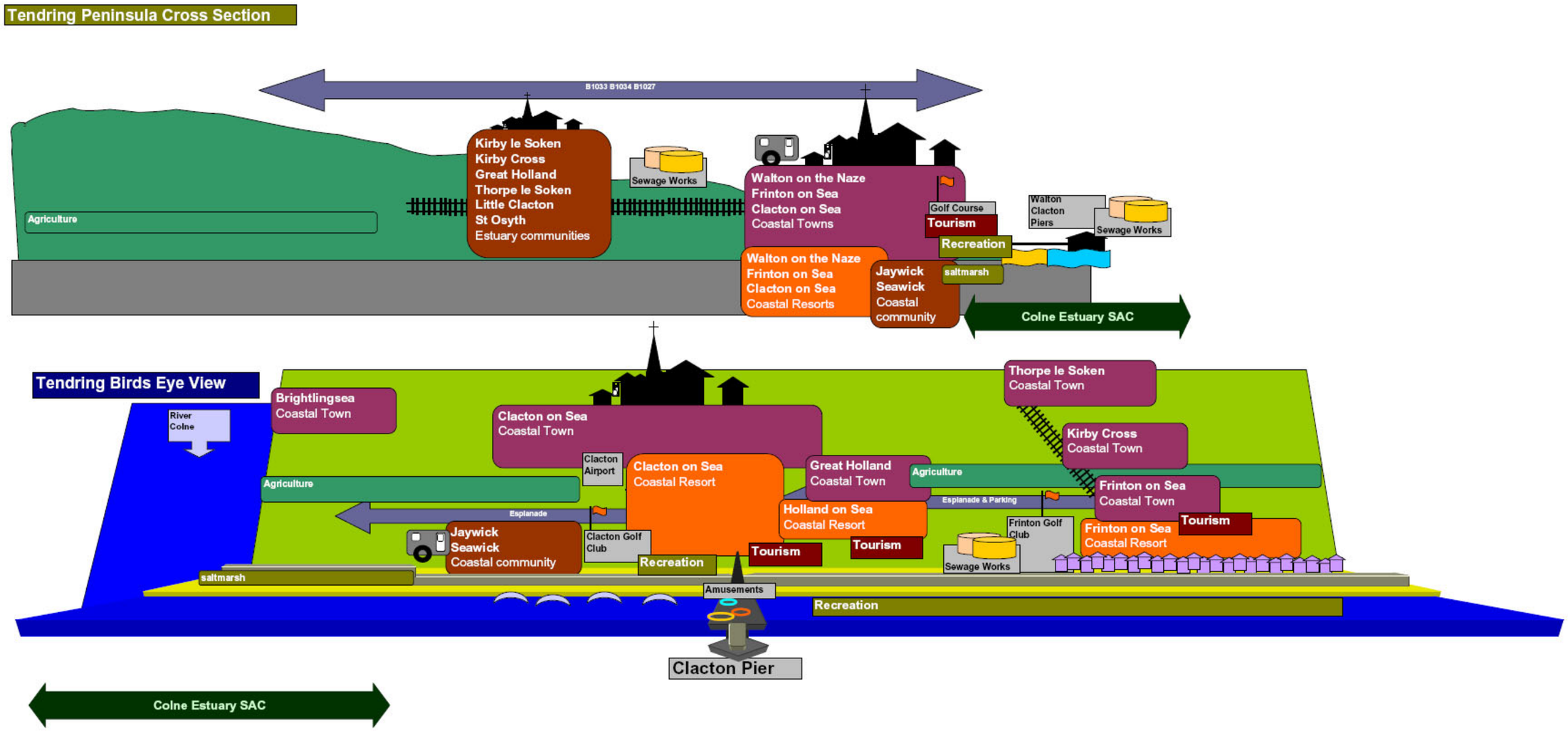
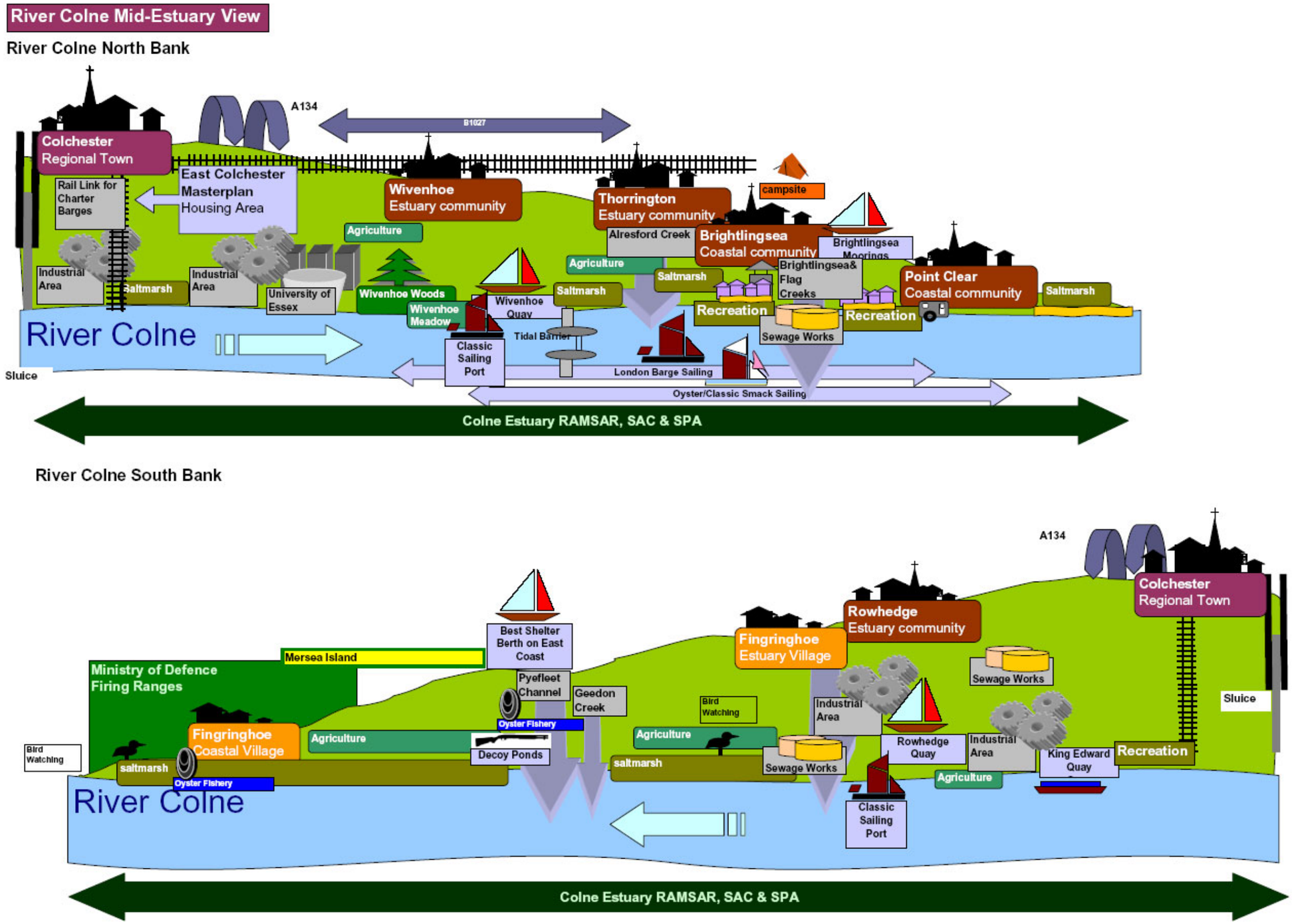
Cross-sectional representation of Hamford Water



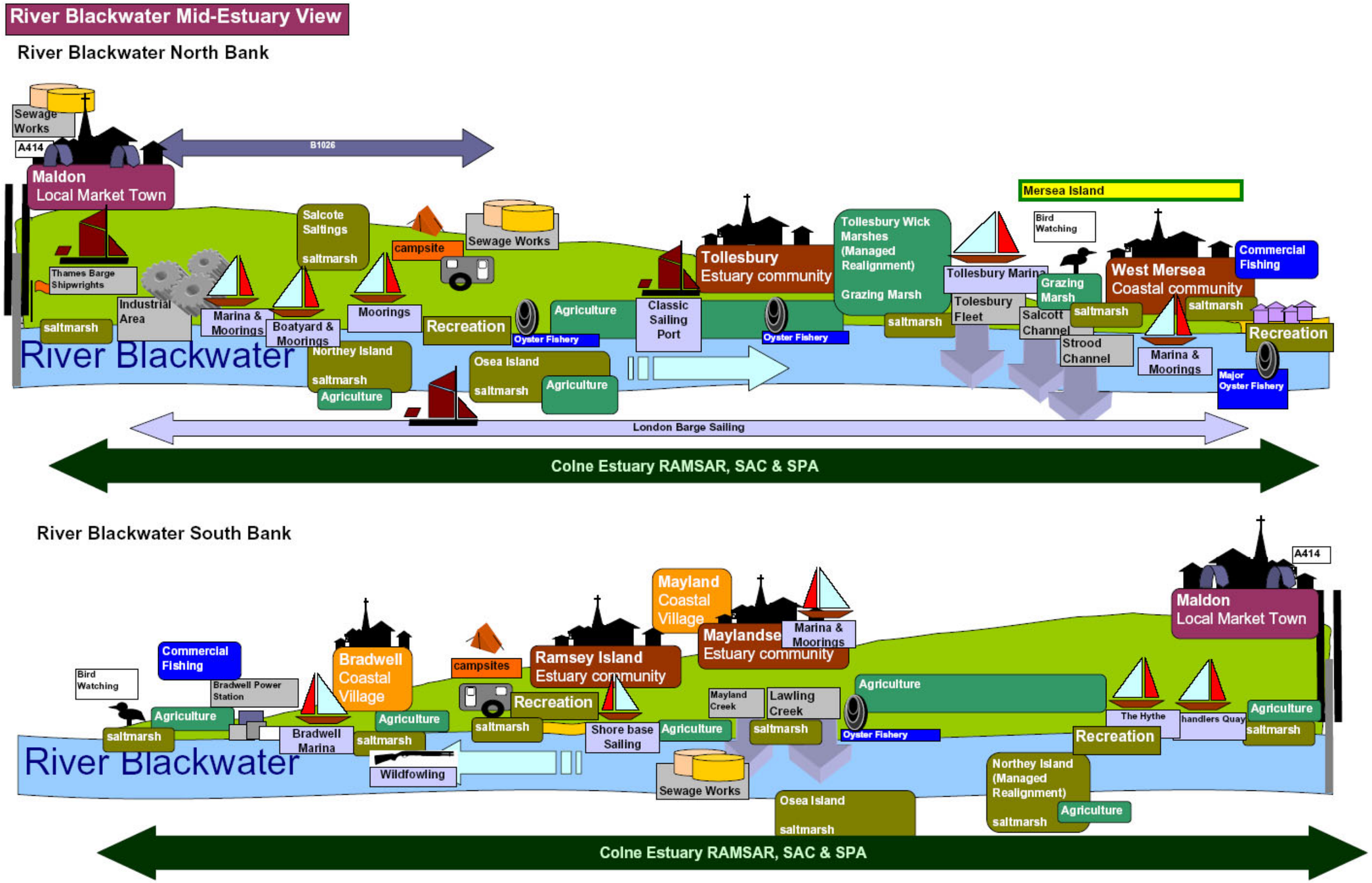
Cross-sectional representation of Tendring Peninsula



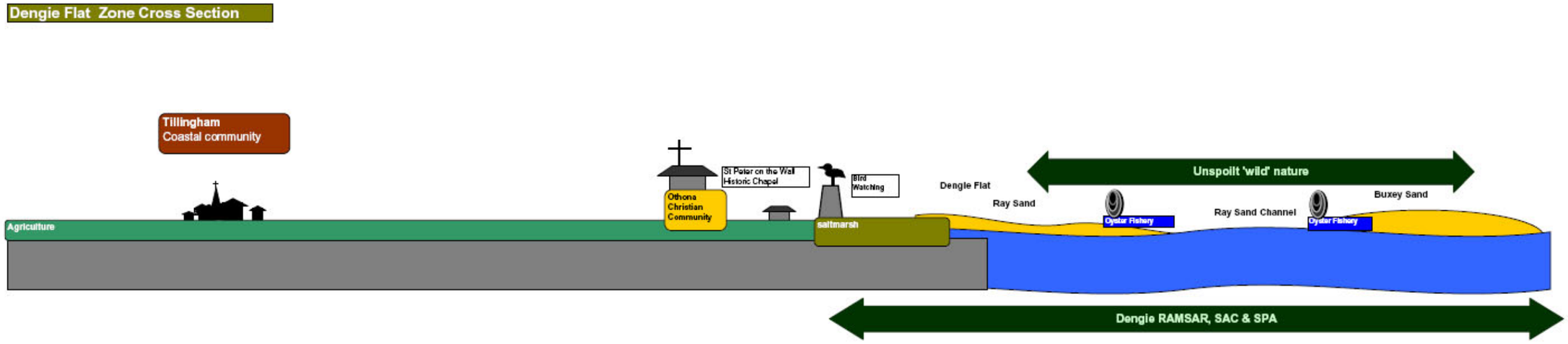
Cross-sectional representation of River Colne (mid-estuary)



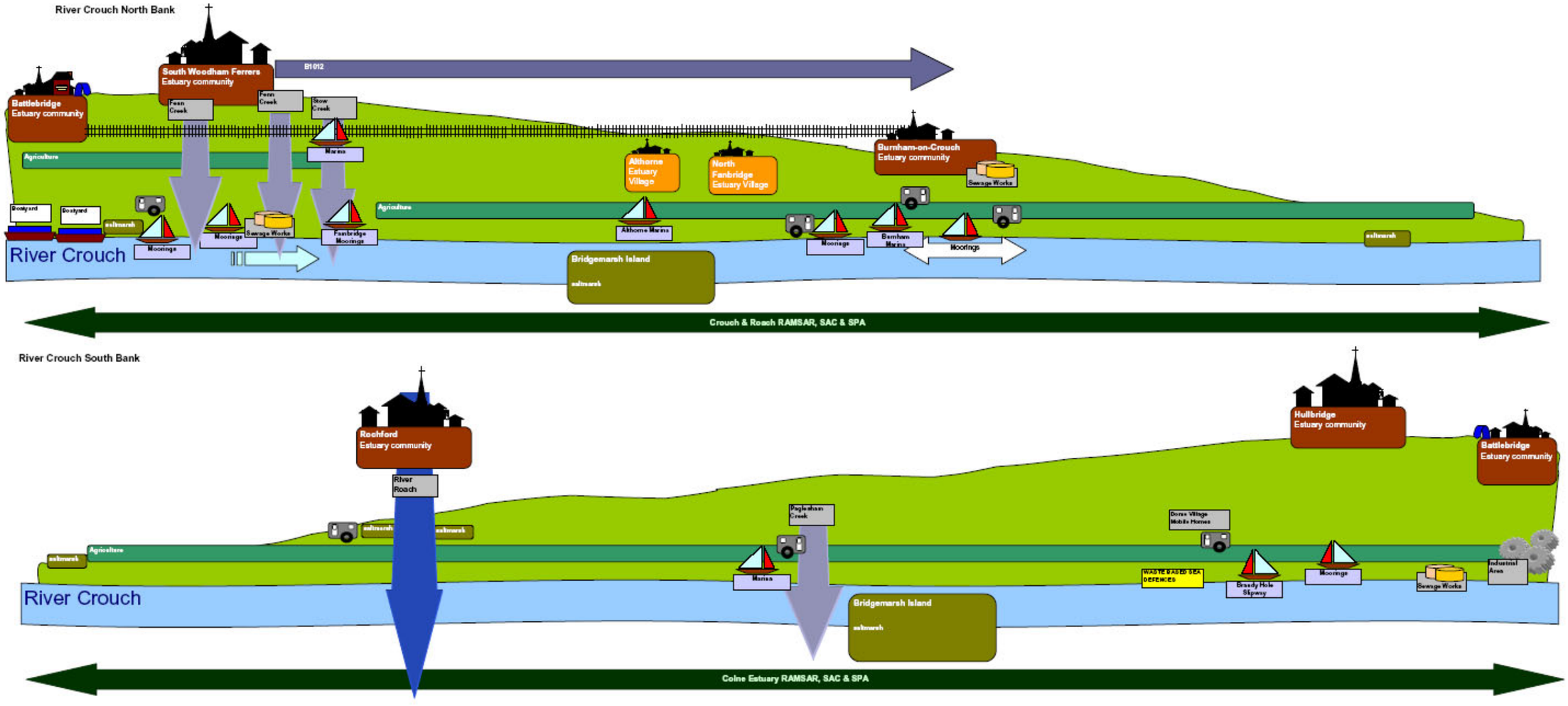
Cross-sectional representation of River Blackwater (mid-estuary)



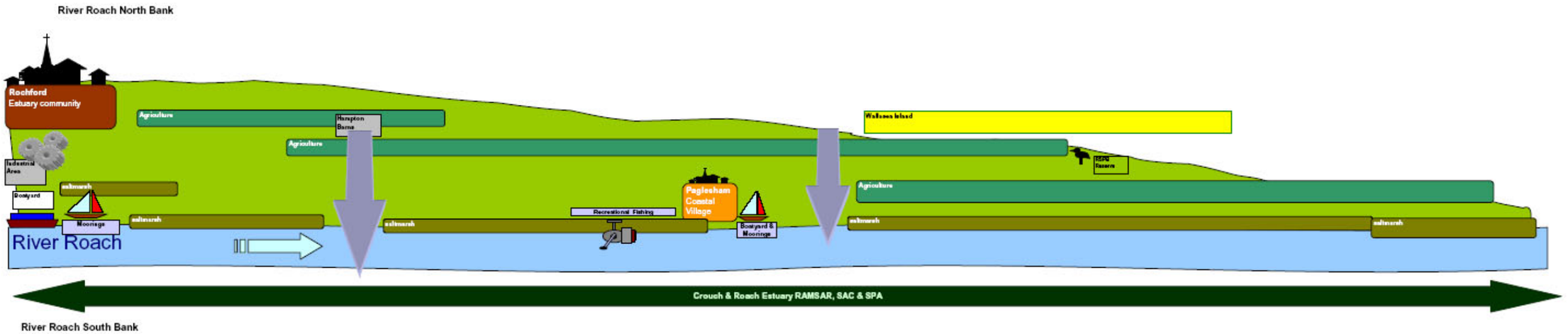
Cross-sectional representation of Dengie Flat



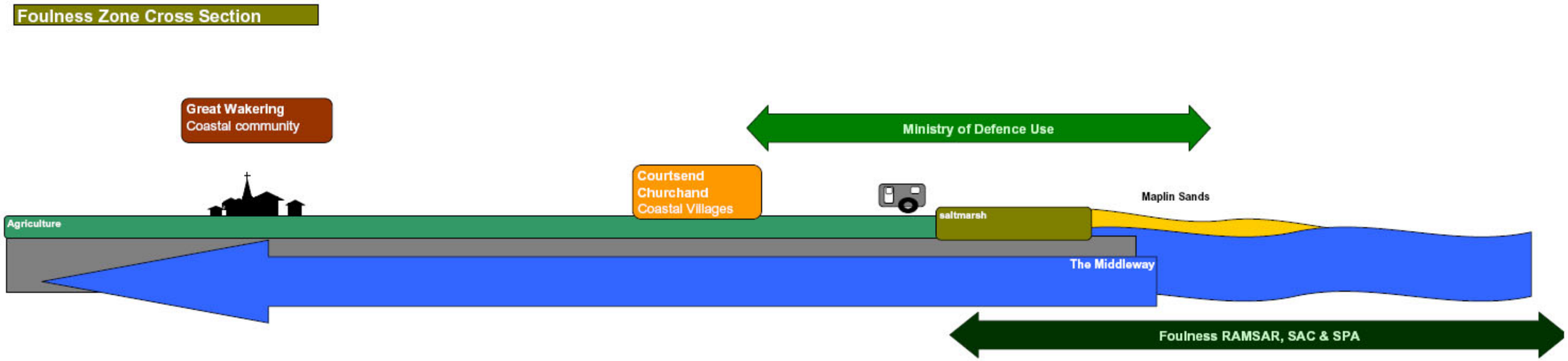
Cross-sectional representation of River Crouch



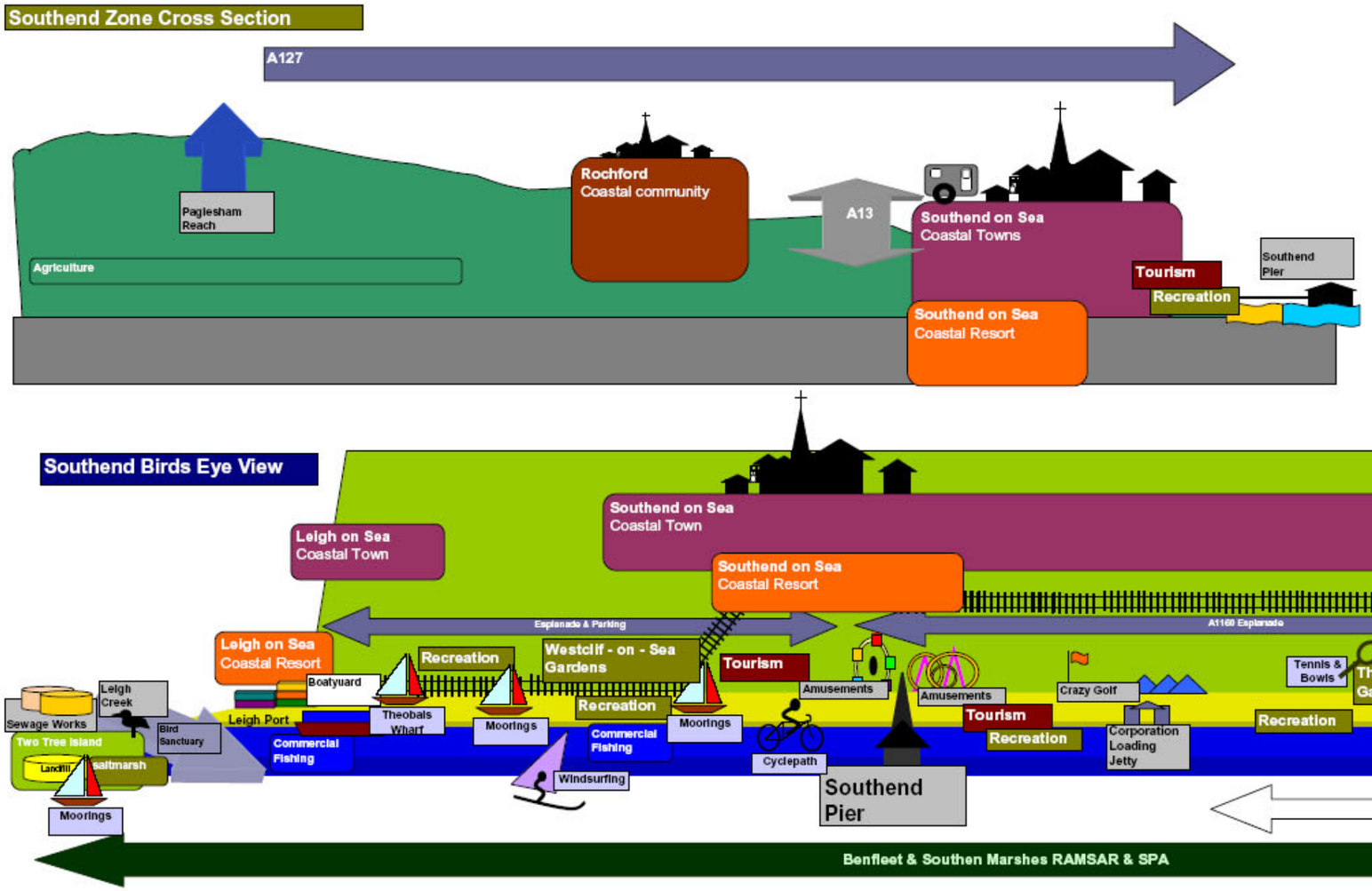
Cross-sectional representation of River Roach



Cross-sectional representation of Foulness



Cross-sectional representation of Southend



ANNEX V

SMP policy table

PDZ	Policy		
	Now - 2025	2025 - 2055	2055 - 2105
A1	AtL	HtL	HtL
A2	HtL	MR2	HtL
A3a	HtL	MR2	NAI
A3b	HtL	HtL	HtL
A4a	MR1	MR1	MR1
A4b	NAI	NAI	NAI
A5	HtL	HtL	HtL
A6	MR1	MR1	MR1
A7a	NAI	NAI	NAI
A7b	MR1	MR1	MR1
A8a	MR2	HtL	HtL
A8b	HtL	MR2	HtL
A8c	MR1	MR1	MR1
A9a,d,f	HtL	HtL	HtL
A9b	NAI	NAI	NAI
A9c,e	MR1	MR1	MR1
A10a,c,e	HtL	HtL	HtL
A10b,g	NAI	NAI	NAI
A10d,f	MR1	MR1	MR1
A11a	AtL	HtL	HtL
A11b	HtL	HtL	HtL
B1	HtL	HtL	HtL
B2	HtL	MR2	HtL
B3	HtL	HtL	HtL
B3a	HtL	HtL	MR2
B4a	MR2	HtL	HtL
B4b	HtL	HtL	HtL
B5	HtL	HtL	MR2
B6a	NAI	NAI	NAI
B6b	MR1	MR1	MR1
C1	HtL	HtL	HtL
C2	HtL	HtL	MR2
C3	HtL	HtL	HtL
C4	HtL	MR2 / HtL	MR2 / HtL
D1a	HtL	HtL	HtL
D1b	HtL	MR2	HtL
D2	HtL	MR2	HtL
D3	HtL	MR2	HtL
D4	HtL	HtL	HtL
D5	HtL	MR2	HtL
D6a and D6b	HtL	HtL	HtL
D7	HtL	HtL	HtL
D8a	HtL	MR2	NAI

PDZ	Policy		
	Now - 2025	2025 - 2055	2055 - 2105
D8b	HtL	HtL	HtL
D8c	HtL	HtL	HtL
E1	HtL	HtL	MR2
E2	HtL	MR2	HtL
E3	HtL	HtL	HtL
E4a	HtL	MR2	HtL
E4b	HtL	HtL	HtL
F1	HtL	HtL	HtL
F2	HtL	HtL	HtL
F3	HtL	HtL	MR2
F4	HtL	HtL	HtL
F5	HtL	HtL	MR2
F6	HtL	HtL	HtL
F7	HtL	HtL	HtL
F8	HtL	HtL	HtL
F9	HtL	HtL	HtL
F9a	HtL	MR2	HtL
F9b	HtL	HtL	HtL
F10	HtL	HtL	HtL
F11a,b	NAI	NAI	NAI
F11c	HtL	HtL	HtL
F12	HtL	HtL	MR2
F13	HtL	HtL	HtL
F14	MR2	HtL	HtL
F15	HtL	HtL	HtL
G1	HtL	HtL	HtL
G2	HtL	HtL	HtL
G3	HtL	HtL	HtL
H1	HtL	HtL	HtL
H2a	HtL	MR2	HtL
H2b	HtL	HtL	MR2
H3	HtL	HtL	HtL
H4	HtL	HtL	HtL
H5	HtL	HtL	HtL
H6	HtL	HtL	HtL
H7	HtL	HtL	HtL
H8a	HtL	HtL	HtL
H8b	HtL	MR2	HtL
H9	NAI	NAI	NAI
H10	MR2	HtL	HtL
H11a	HtL	MR2	HtL
H11b	HtL	HtL	MR2
H12	HtL	HtL	HtL
H13	HtL	HtL	HtL
H14	HtL	HtL	HtL

PDZ	Policy		
	Now - 2025	2025 - 2055	2055 - 2105
H15	HtL	HtL	HtL
H16	HtL	HtL	HtL
I1a	HtL	HtL	HtL
I1b	HtL	HtL	HtL
I1c	HtL	HtL	MR2
J1	HtL	HtL	HtL