

**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'.

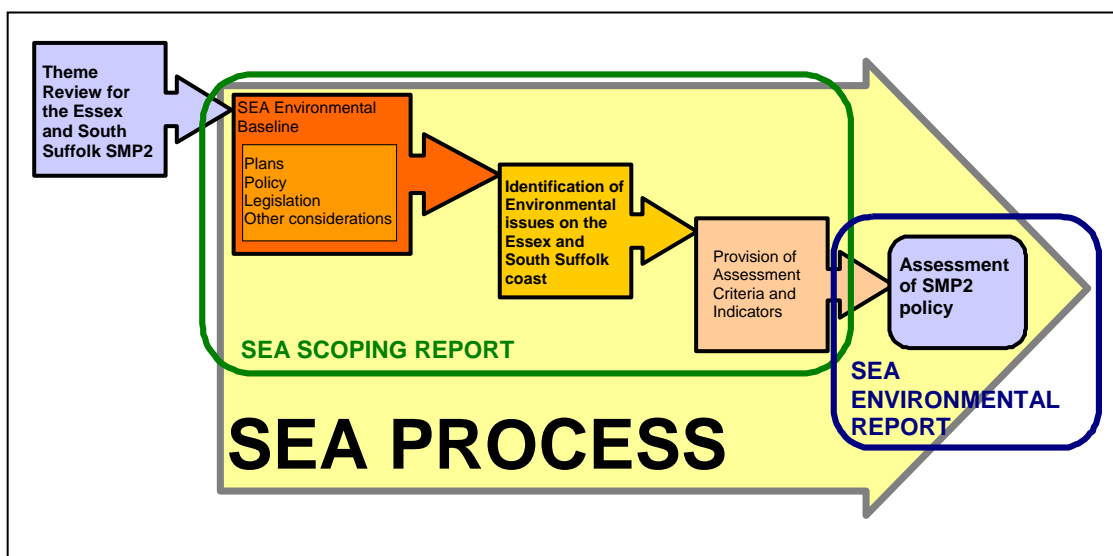
### **Strategic Environmental Assessment within the SMP2**

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***

#### Providing comments

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 18<sup>th</sup> 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.

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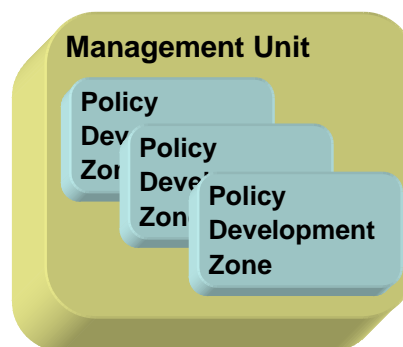
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## L1 INTRODUCTION AND BACKGROUND

### 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<sup>1</sup>):

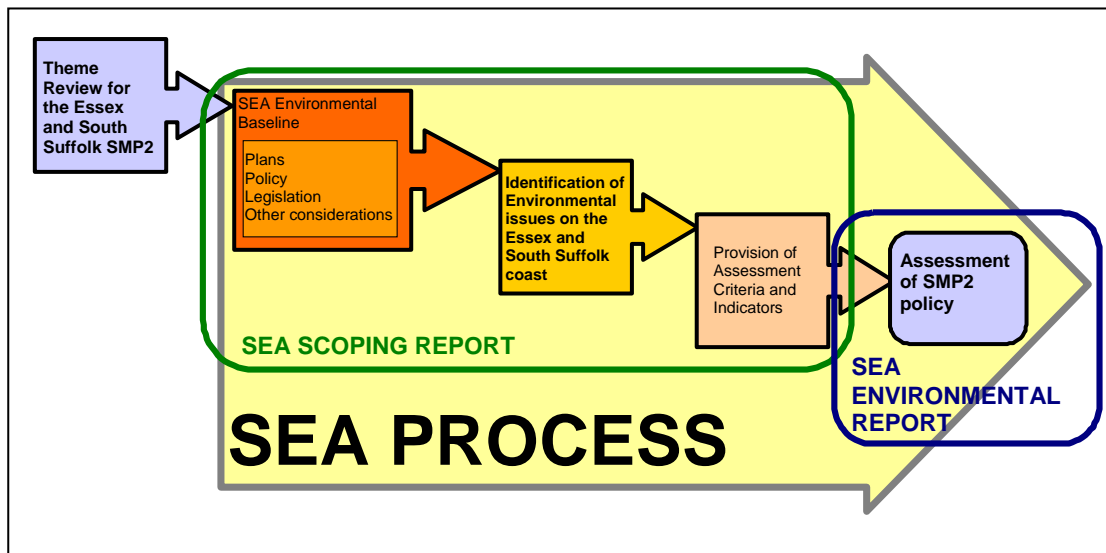
#### RECEPTORS

- 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.

<sup>1</sup> 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**

<b>SMP2 option</b>	<b>Description of option</b>
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**

<b>SMP2 option</b>	<b>Positive impacts</b>	<b>Negative impacts</b>
Hold the line (HTL)	<ul style="list-style-type: none"> <li>• Protection of communities and infrastructure located within the coastal flood zone;</li> <li>• Protection of habitat landward of defences;</li> <li>• Protects freshwater resources (e.g. abstractions and boreholes);</li> <li>• Provides stability to areas of coastline, within a wider management context;</li> <li>• Protects economic assets located behind defences; and</li> <li>• Provides protection to ecological, cultural and historical assets landward of the defences.</li> </ul>	<ul style="list-style-type: none"> <li>• Coastal squeeze (loss of habitat);</li> <li>• Interruption of coastal processes;</li> <li>• May increase flood and coastal erosion risk elsewhere;</li> <li>• Promotes unsustainable land use practices with the coastal flood zone;</li> <li>• Diverts limited resources away from an adaptation response to rising sea levels; and</li> <li>• Requires ongoing commitment to future investment in maintenance and improvement.</li> </ul>
Advance the line (ATL)	<ul style="list-style-type: none"> <li>• Provides additional space for communities;</li> <li>• Protection of communities and infrastructure located within the coastal flood zone;</li> <li>• Protection of habitat landward of defences;</li> <li>• Protects freshwater resources (e.g. abstractions and boreholes);</li> <li>• Protects economic assets located behind defences; and</li> <li>• Provides protection to ecological, cultural and historical assets landward of the defences.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in extent of coastal habitat;</li> <li>• Change in functionality of habitat;</li> <li>• Increased coastal squeeze;</li> <li>• Interruption of coastal processes;</li> <li>• Effect on marine habitat; and</li> <li>• May increase rate of coastal erosion either side of the advanced line.</li> </ul>
Managed realignment (MR)	<ul style="list-style-type: none"> <li>• Coastal habitats allowed to move landwards under rising sea levels</li> <li>• Creation of habitat to aid UKBAP; (United Kingdom Biodiversity Action Plan) and local BAP (Biodiversity Action Plan) targets;</li> <li>• Habitat created for juvenile fish and other aquatic organisms (benefits to environment and fishing communities);</li> <li>• Reduces flood risk;</li> <li>• Promotes natural coastal processes;</li> <li>• Contributes towards a more natural management of the coast; and</li> <li>• Creation of high tide roosts and feeding areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in extent of habitat landwards of defences;</li> <li>• Change in nature of habitat to landward of defence;</li> <li>• Impact upon aquifers and abstractions;</li> <li>• Loss of communities or community assets;</li> <li>• Loss of heritage and cultural features; and</li> <li>• Requires ongoing commitment to future investment in maintenance and improvement.</li> </ul>

SMP2 option	Positive impacts	Negative impacts
No active intervention (NAI)	<ul style="list-style-type: none"> <li>Coastal habitats allowed to move landwards under rising sea levels;</li> <li>Promotes natural coastal processes; and</li> <li>Contributes towards a more natural management of the coast.</li> </ul>	<ul style="list-style-type: none"> <li>Lack of certainty of effects and time for adaptation;</li> <li>Increased risk of inundation to landward habitats under rising sea levels;</li> <li>Impact upon aquifers and abstractions;</li> <li>Loss of communities or community assets; and</li> <li>Loss of heritage and cultural features.</li> </ul>

### L1.5.3 Implications of SMP2 policy on environmental receptors

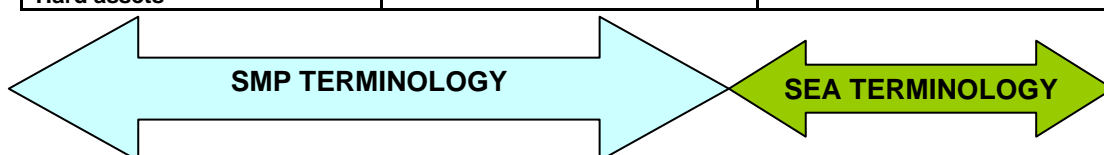
Defra SEA guidance (Defra, 2004) identifies a series of environmental receptors which should form the initial scope of the SEA. These are the environmental features which may be impacted the SMP.

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 28<sup>th</sup> August and 25<sup>th</sup> 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	<ul style="list-style-type: none"> <li>Existing land use: communities, infrastructure, agriculture, historical assets, freshwater habitats, tourism / amenity</li> </ul>	<ul style="list-style-type: none"> <li>Flood risk management budget</li> <li>Intertidal habitats (coastal squeeze)</li> <li>Coastal / estuary processes</li> </ul>
Managed Realignment	<ul style="list-style-type: none"> <li>Intertidal habitats</li> <li>Flood risk management budget (in case of realignment to more cost effective location)</li> <li>Wider benefits (tourism, amenity, fisheries, etc)</li> </ul>	<ul style="list-style-type: none"> <li>Existing land use: communities, infrastructure, agriculture, historical assets, freshwater habitats, tourism / amenity</li> <li>Flood risk management budget (in case of realignment to less cost effective location)</li> </ul>
Advance the Line	<ul style="list-style-type: none"> <li>Reclamation to create agricultural land, freshwater habitats. To be determined whether these are realistic drivers.</li> </ul>	<ul style="list-style-type: none"> <li>Intertidal habitats</li> <li>Existing use of foreshore</li> <li>Flood risk management budget</li> </ul>
No Active Intervention	<ul style="list-style-type: none"> <li>Flood risk management budget</li> <li>Technical feasibility</li> <li>Enhancement of intertidal habitats</li> <li>Coastal / estuary processes (Increase of tidal prism, longshore effects)</li> </ul>	<ul style="list-style-type: none"> <li>Existing land use: communities, infrastructure, agriculture, designated monuments, freshwater habitats</li> </ul>

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

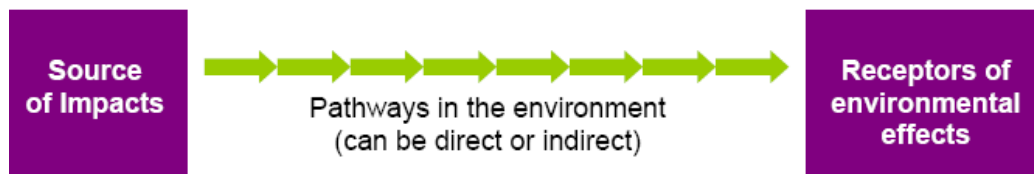
The SEA process is clearly defined in the SEA Regulations and guidance suite. The basic process follows the provision of a Scoping Report (**Annex IV**) which included the environmental baseline, identified key environmental issues, outlined the methodology to be used and offered a series of assessment 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
<b>ISSUE - Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types</b>	
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 <i>Countryside and Rights of Way (CRoW) Act 2000</i> major negative scores would only be provided where the effects of policy would cause a site to move into unfavourable condition.
<b>ISSUE - Maintenance of coastal processes required for sustainable coastal management and the integrity of critical coastal habitat and species</b>	
Will SMP policy lead to the loss of agricultural land	<p>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.</p> <p><b>*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.</b></p>
<b>ISSUE - Maintenance of environmental conditions to support biodiversity and the quality of life</b>	
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
<b>ISSUE - Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries</b>	
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).
<b>ISSUE - Maintenance of water supply in the coastal zone</b>	
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
<b>ISSUE - Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast</b>	
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.
<b>ISSUE - Potential loss of historic and archaeological features on a dynamic coastline</b>	
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
<b>ISSUE - Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce</b>	
<i>Protection of coastal towns and settlements</i>	
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.
<i>Protection of key coastal infrastructure</i>	
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.

<b>Assessment Criteria</b>	<b>How the significance of SMP effects was established</b>
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.
<b>ISSUE - The need to maintain a balance of providing navigation and access to estuary communities</b>	
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:

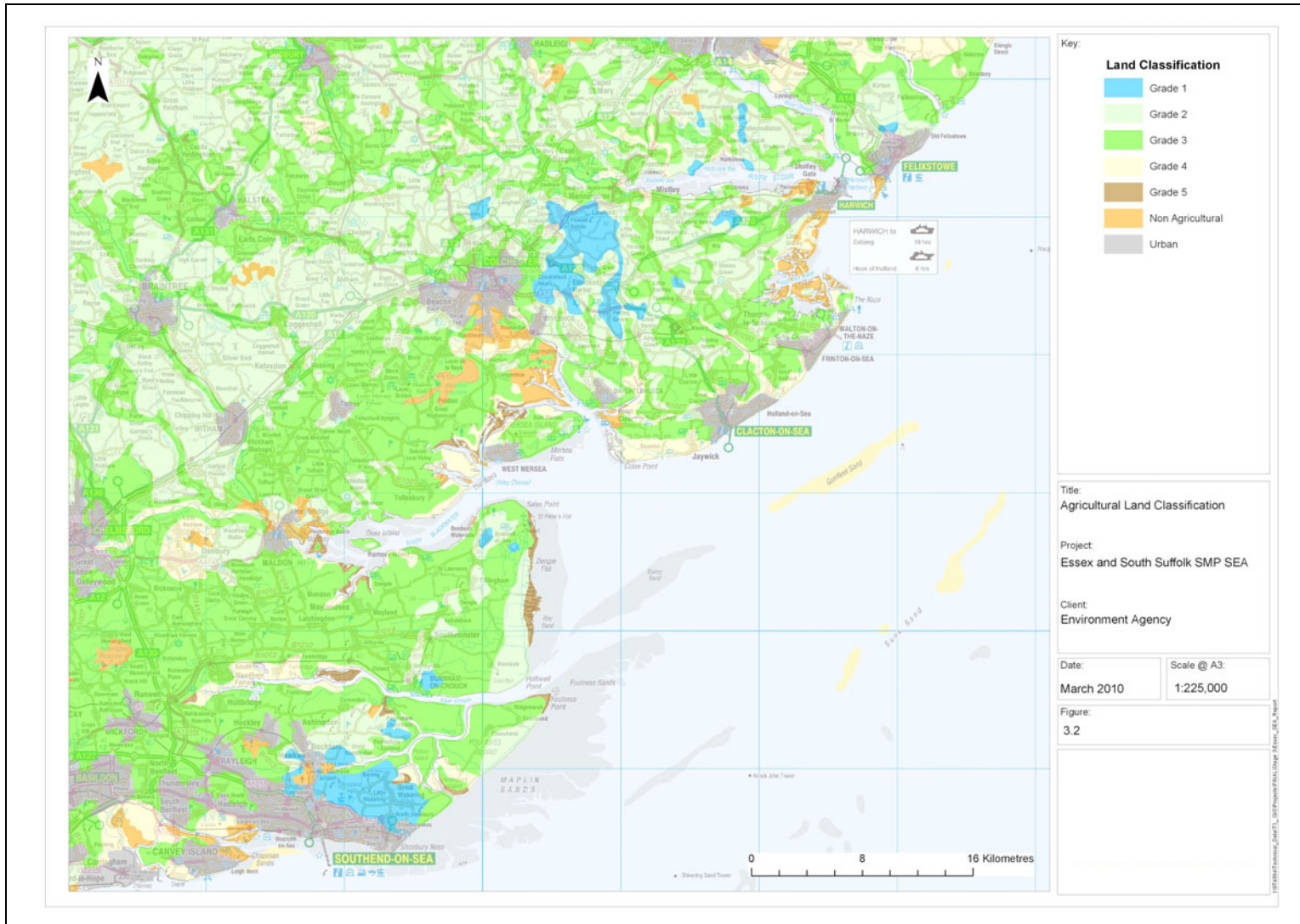
- Walton Backwaters;
- Osea Island;
- Blackwater;
- Strood Channel;
- Salcott Channel;
- Tollesbury Channel;
- Pyefleet;
- Colne;
- Dengie;
- Roach and Lower Crouch;
- Upper Crouch;
- Upper Roach;
- Foulness;
- Outer Thames; and
- Southend.

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: 19 <sup>th</sup> 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.**

<b>District Council</b>	<b>Conservation area</b>
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 Old Town
	Seafront
	Shoebury Garrison



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

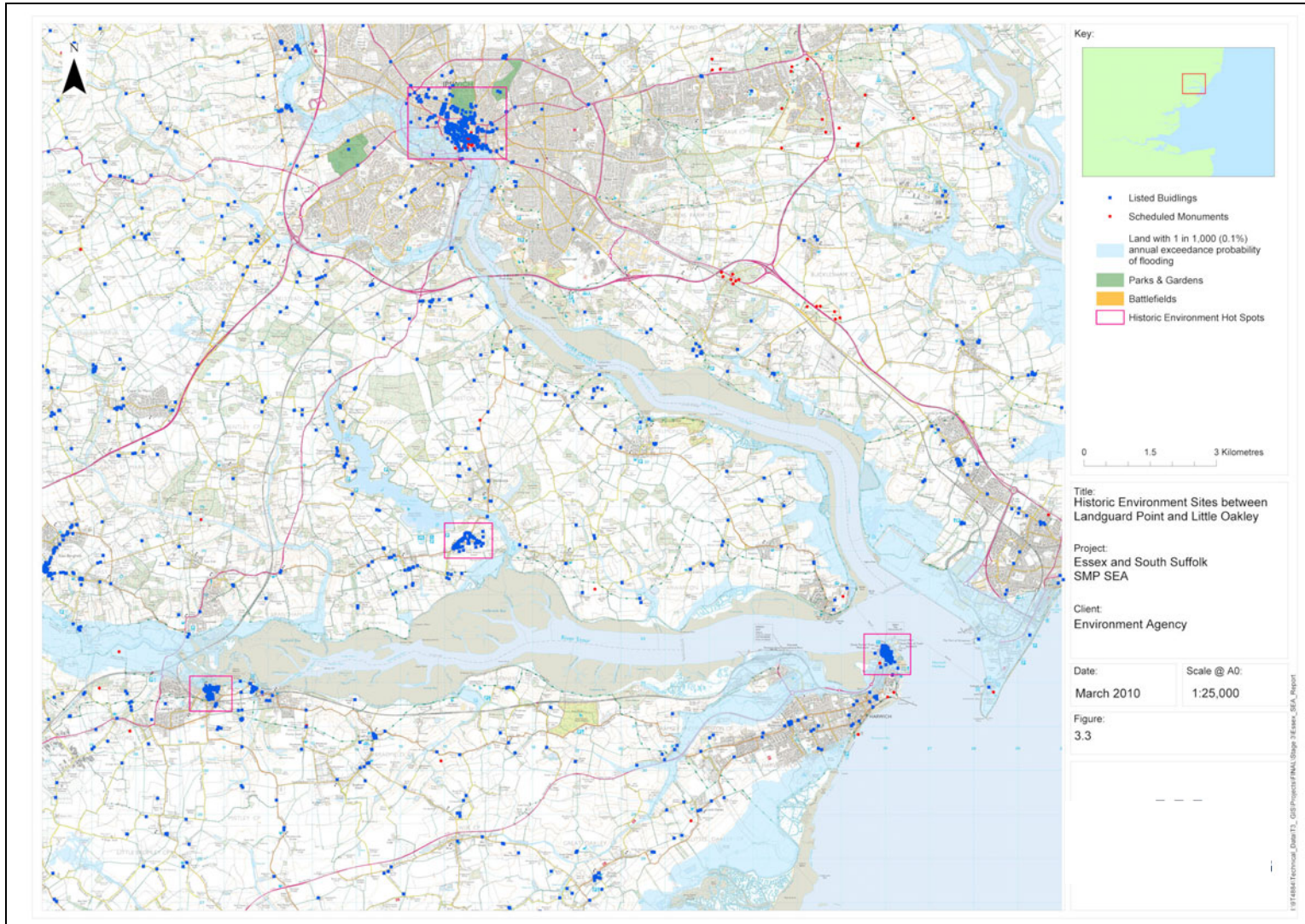


Figure 3.4 Historic Environment map for the study area between Little Oakley and West Mersea

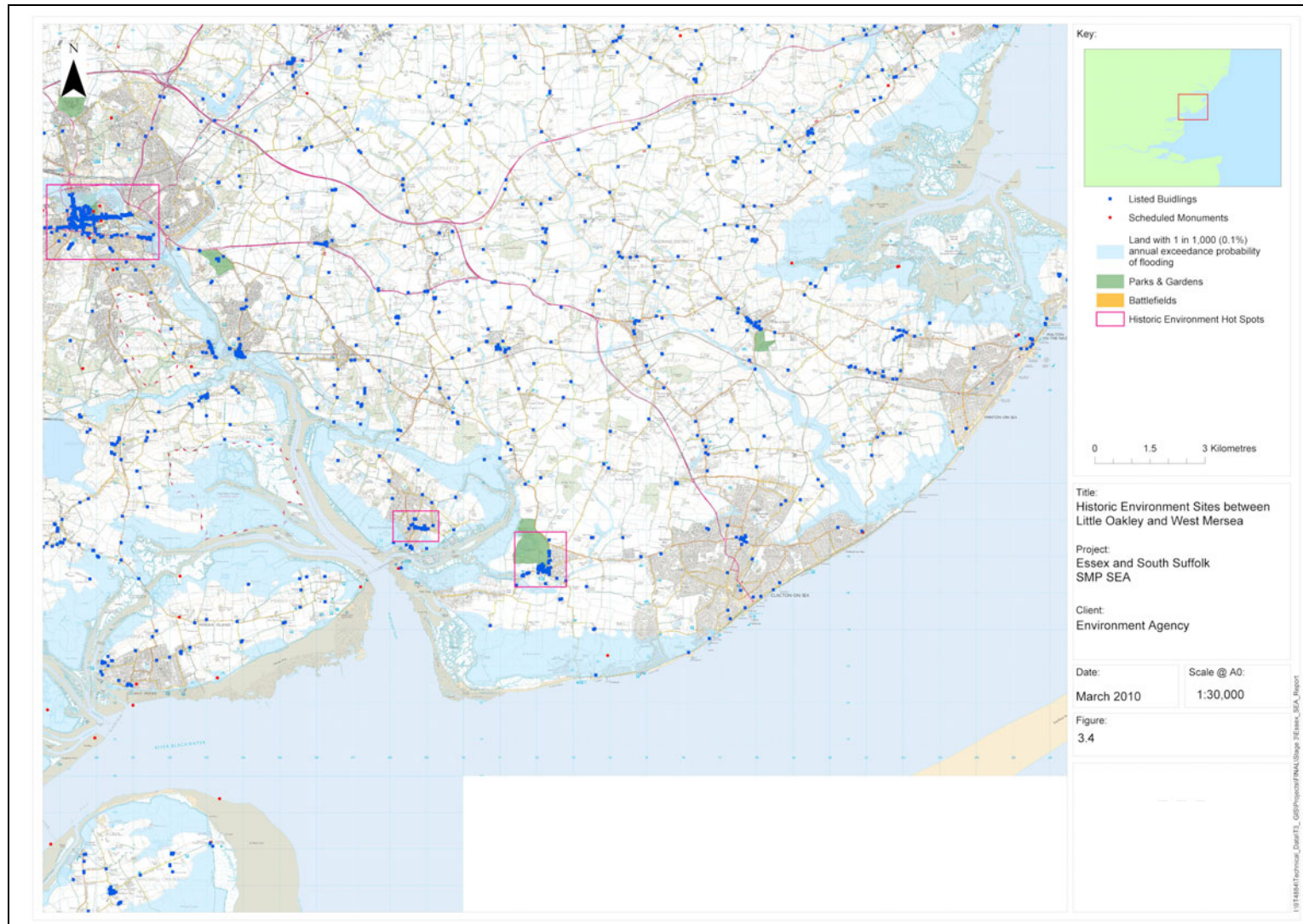


Figure 3.5 Historic Environment map for the study area between West Mersea and Burnham-on-Crouch

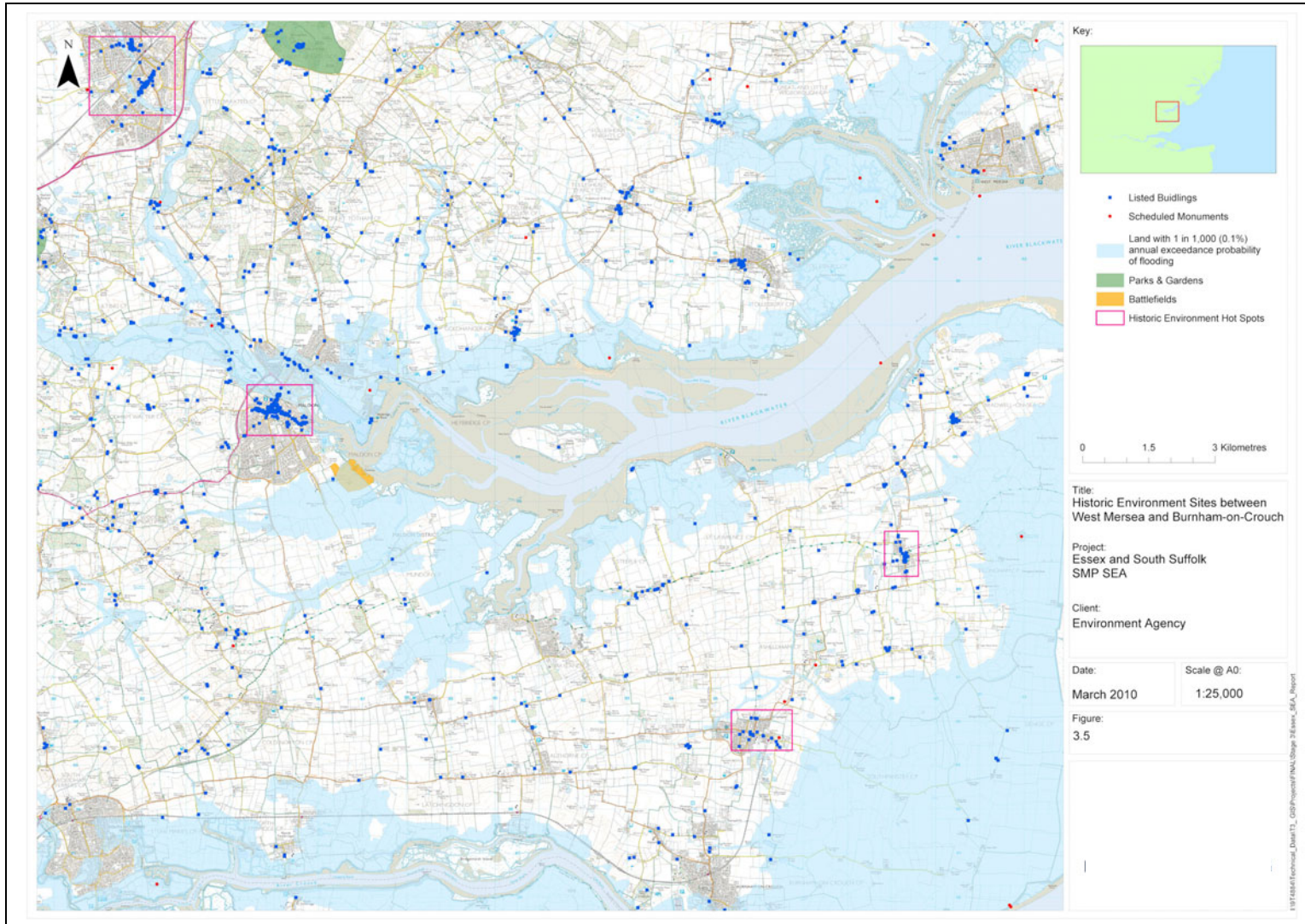
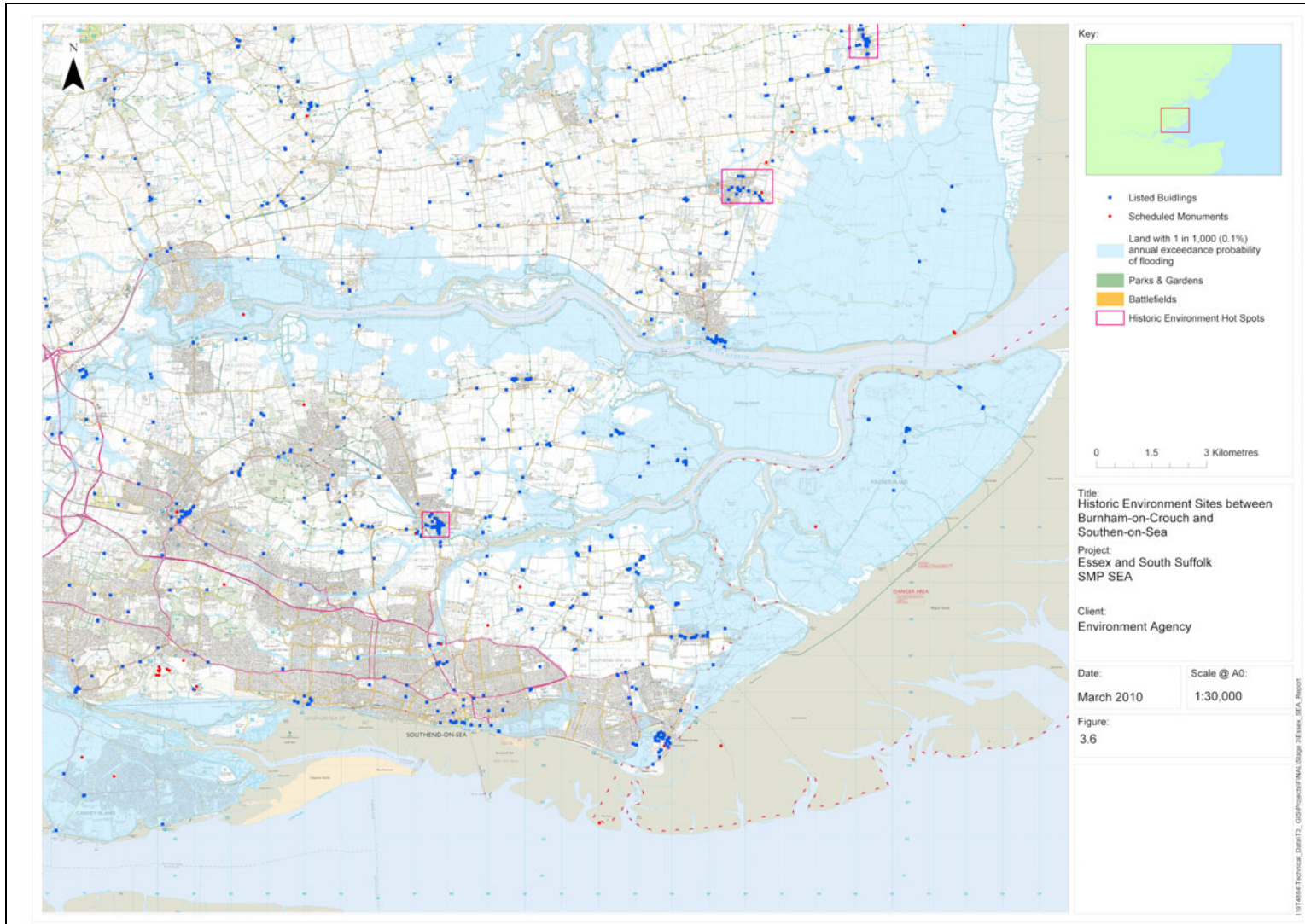


Figure 3.6 Historic Environment map for the study area between Burnham-on-Crouch and Southend-on-Sea



### 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

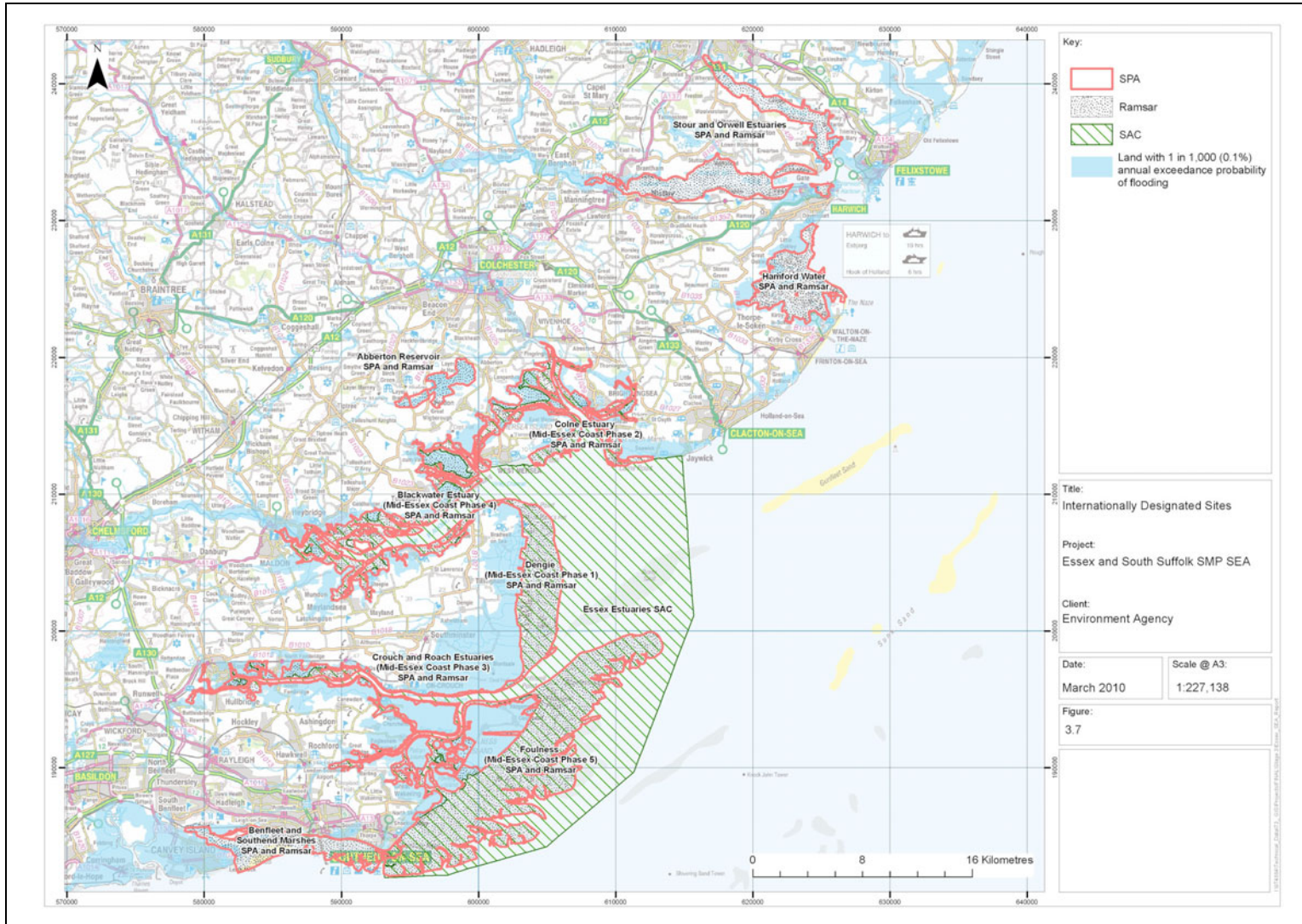
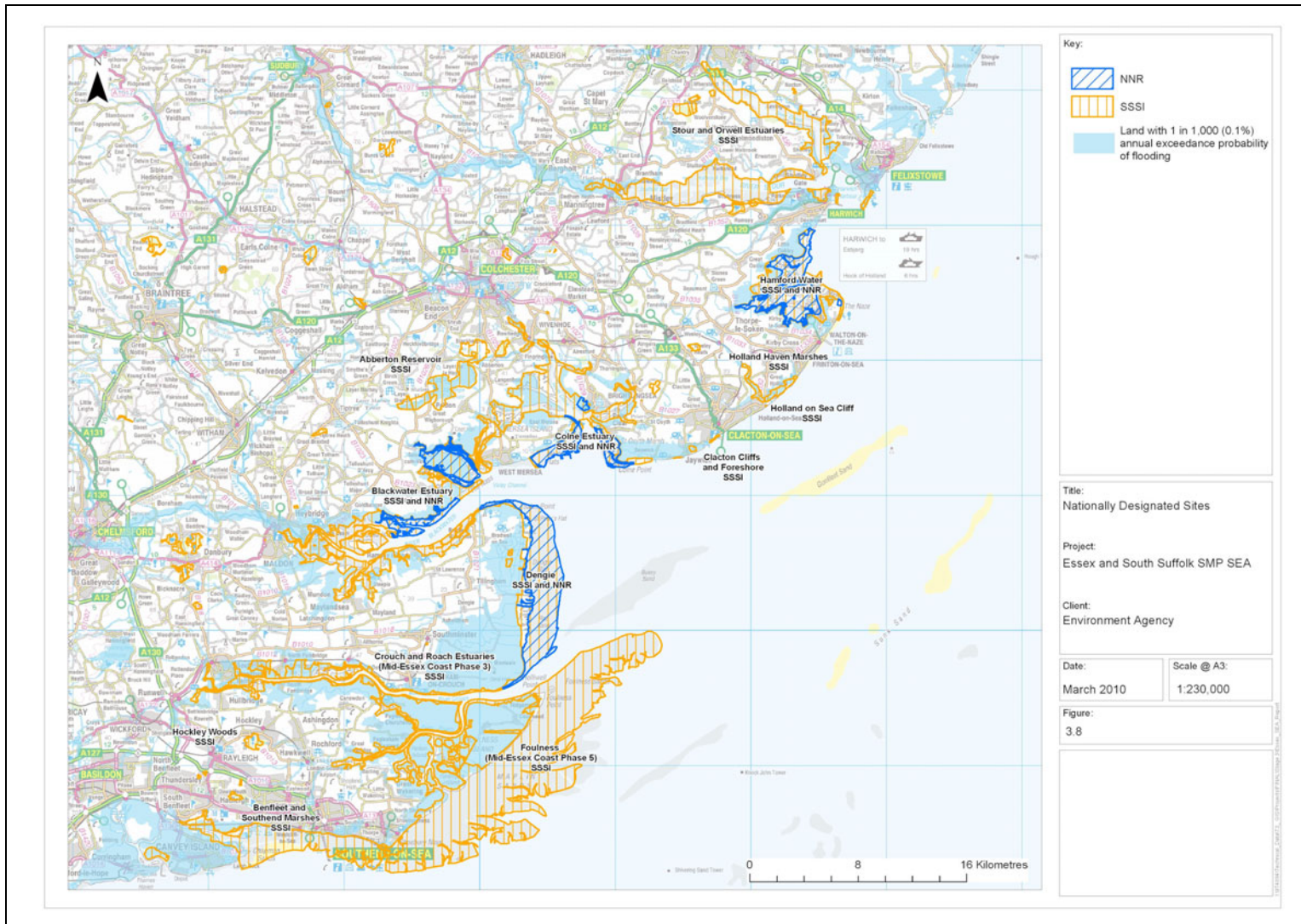


Figure 3.8 Nationally designated sites on the Essex and south Suffolk coastline





### 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

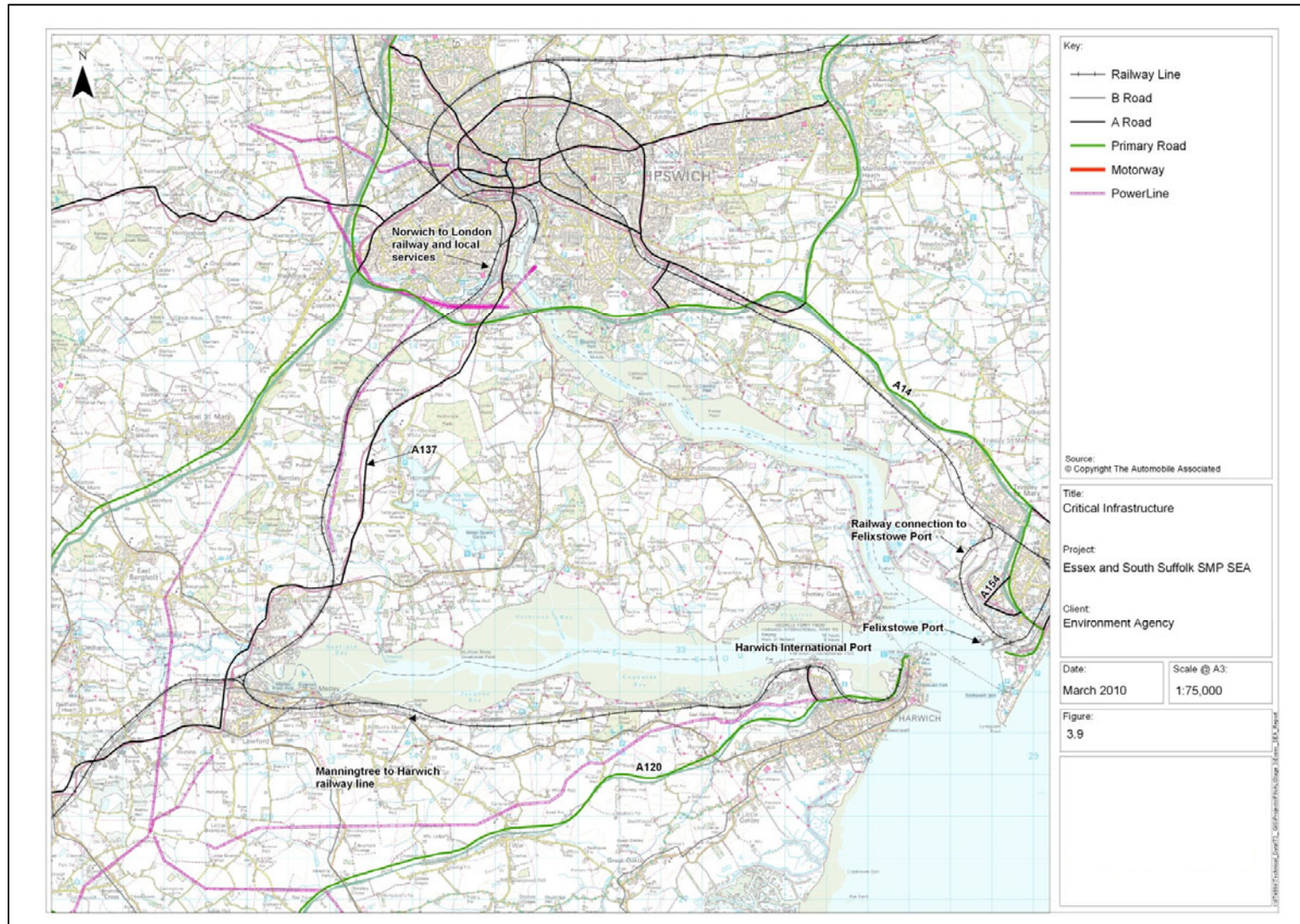
Critical infrastructure within the Essex and South Suffolk coast SMP study area is listed in **Table 3.9** below. Settlements such as Felixstowe, Ipswich and Clacton have high quality road and, in the case of Ipswich, rail infrastructure links. Transport infrastructure in the southern part of the study 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**

<b>Critical Infrastructure</b>	<b>Description</b>
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 5 <sup>th</sup> 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**

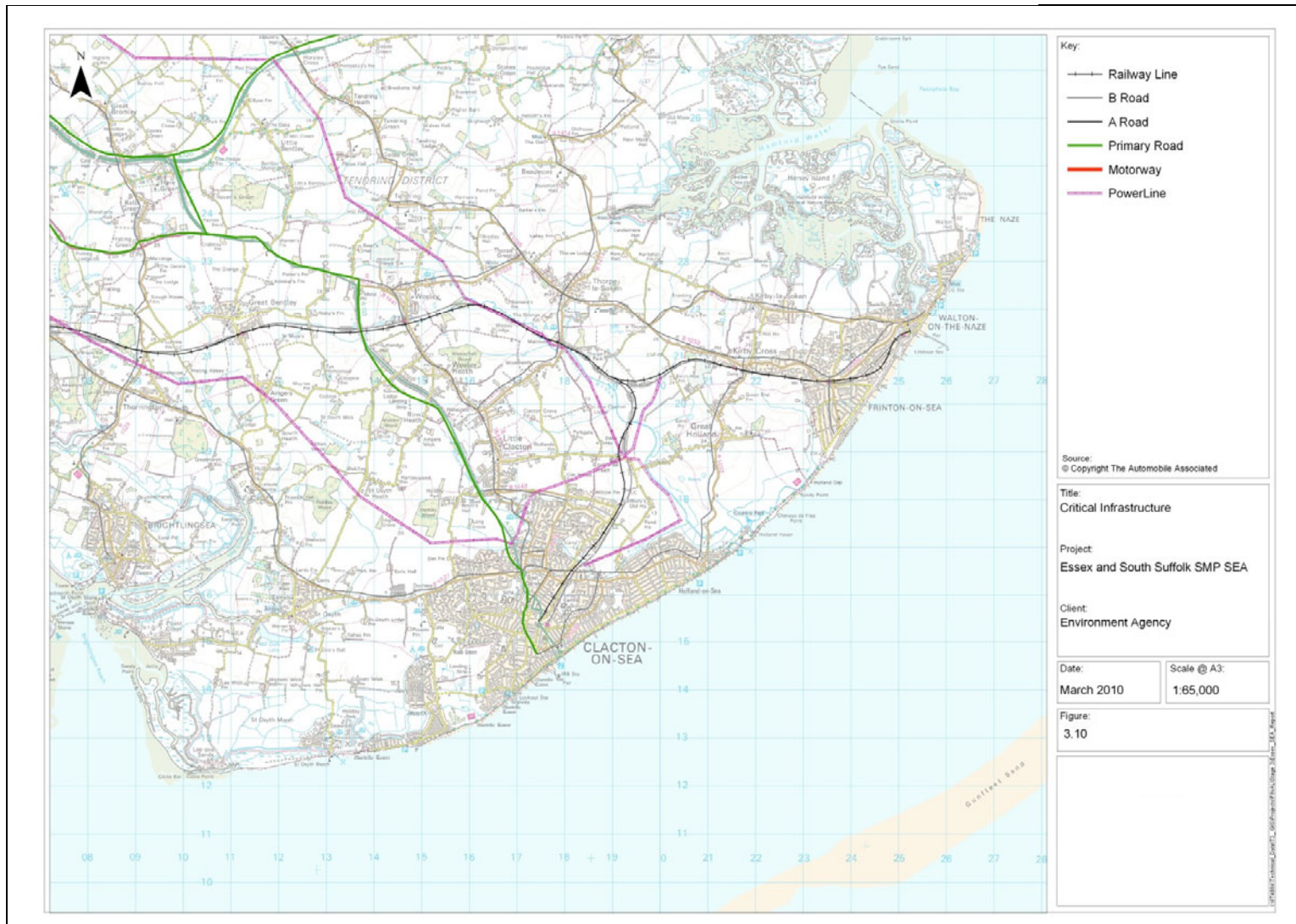
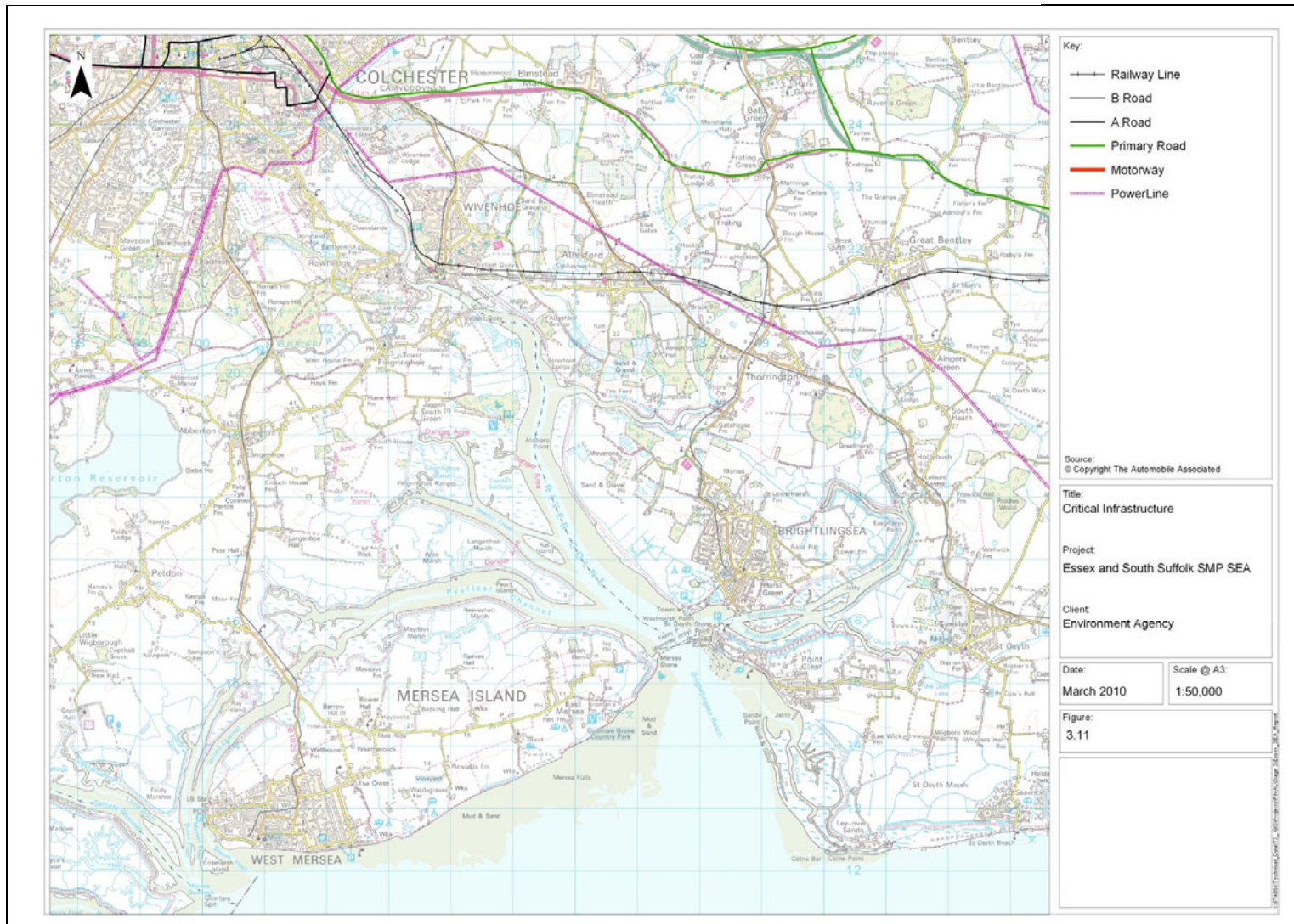
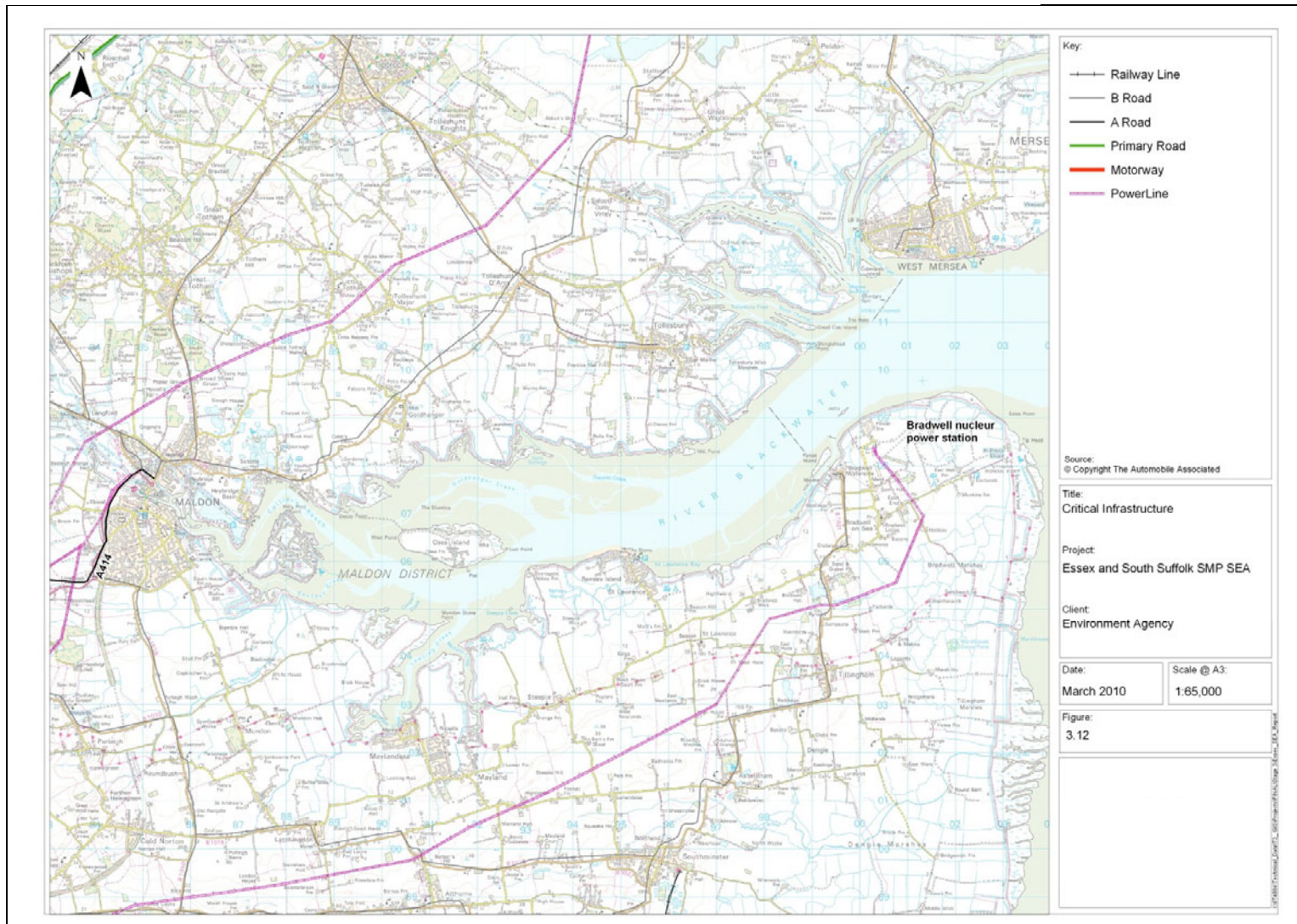


Figure 3.11 Critical infrastructure around the Essex and south Suffolk coast



**Figure 3.12 Critical infrastructure around the Essex and south Suffolk coast**



**Figure 3.13 Critical infrastructure around the Essex and south Suffolk coast**

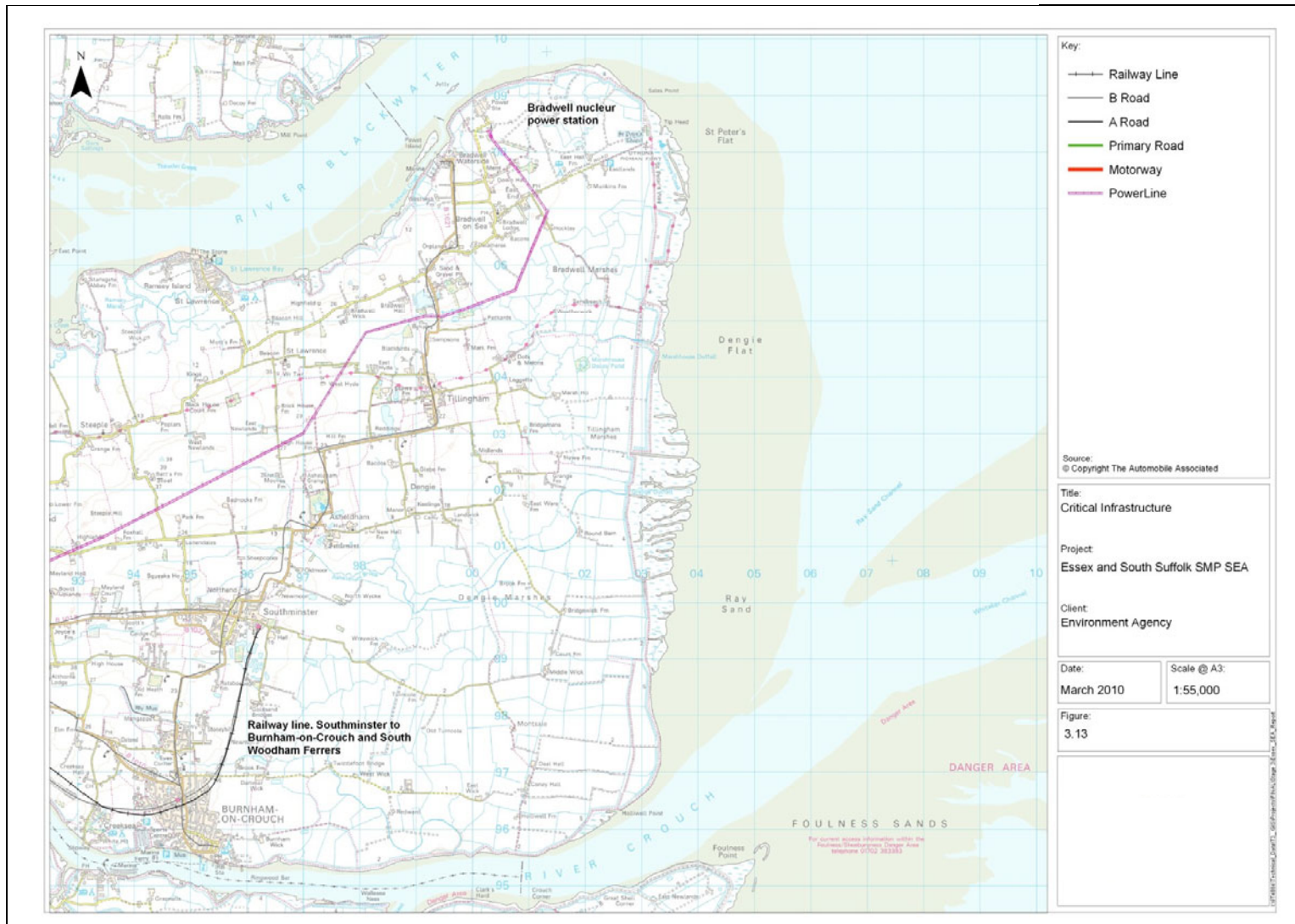


Figure 3.14 Critical infrastructure around the Essex and south Suffolk coast

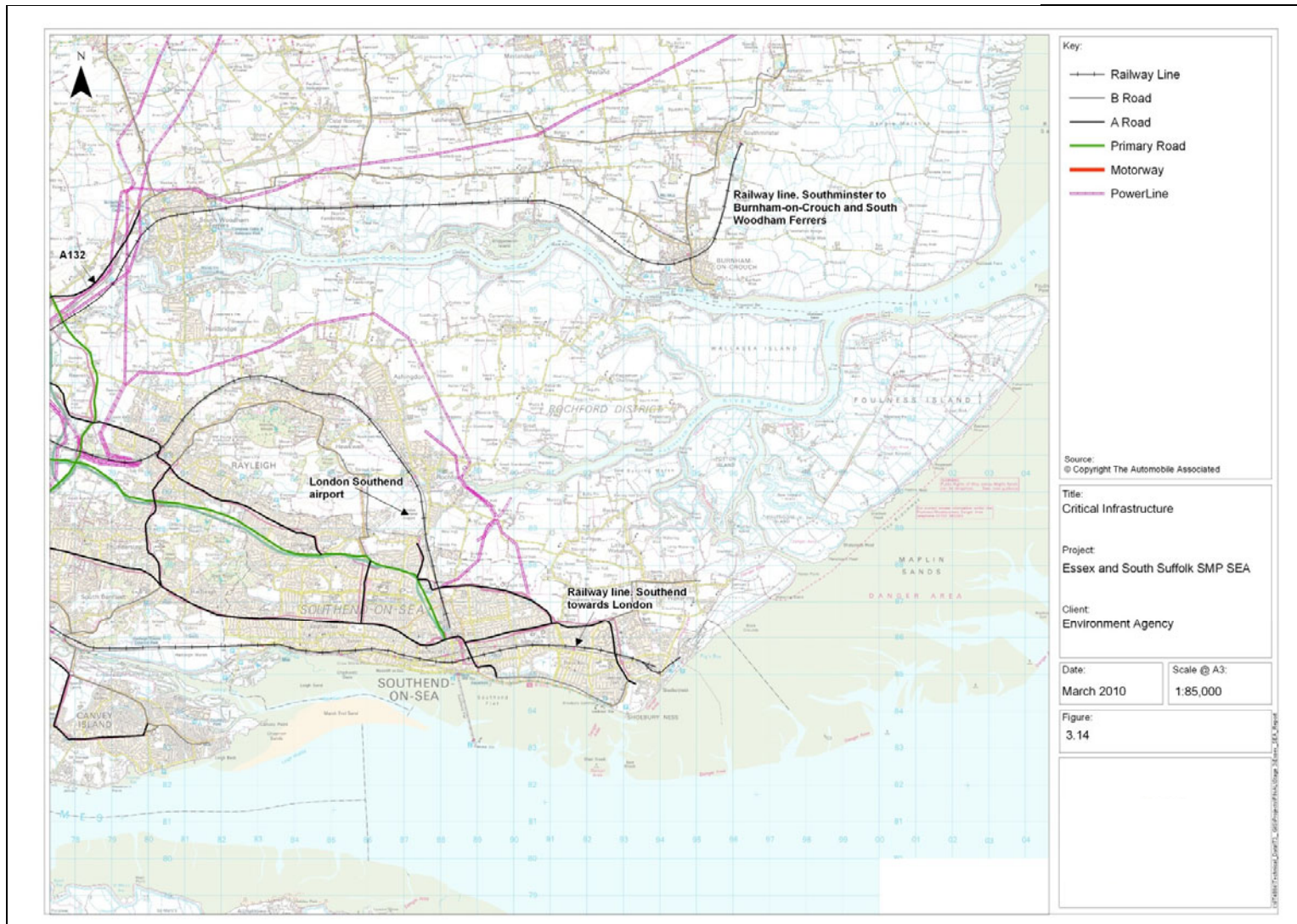
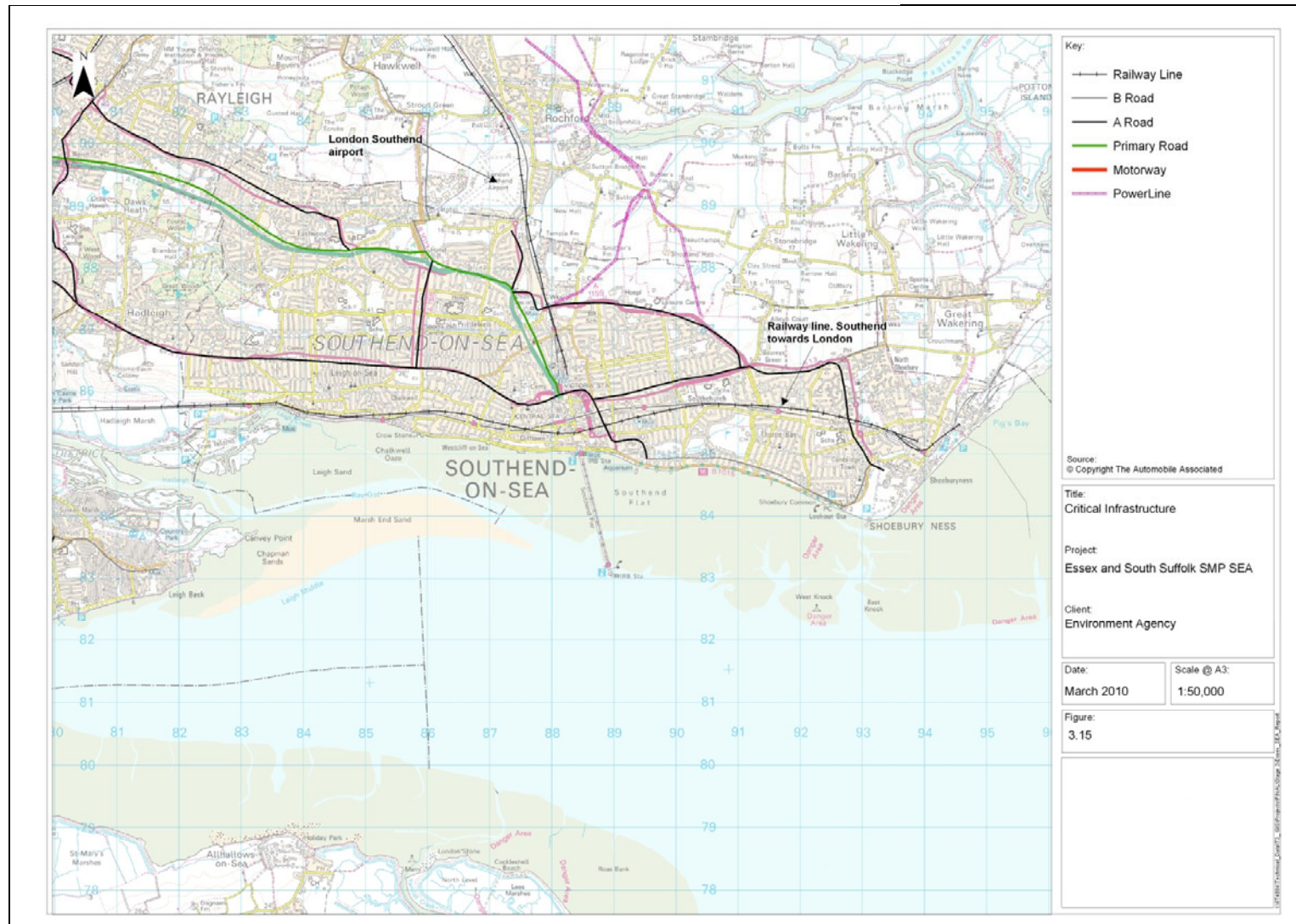




Figure 3.15 Critical infrastructure around the Essex and south Suffolk coast



### **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)

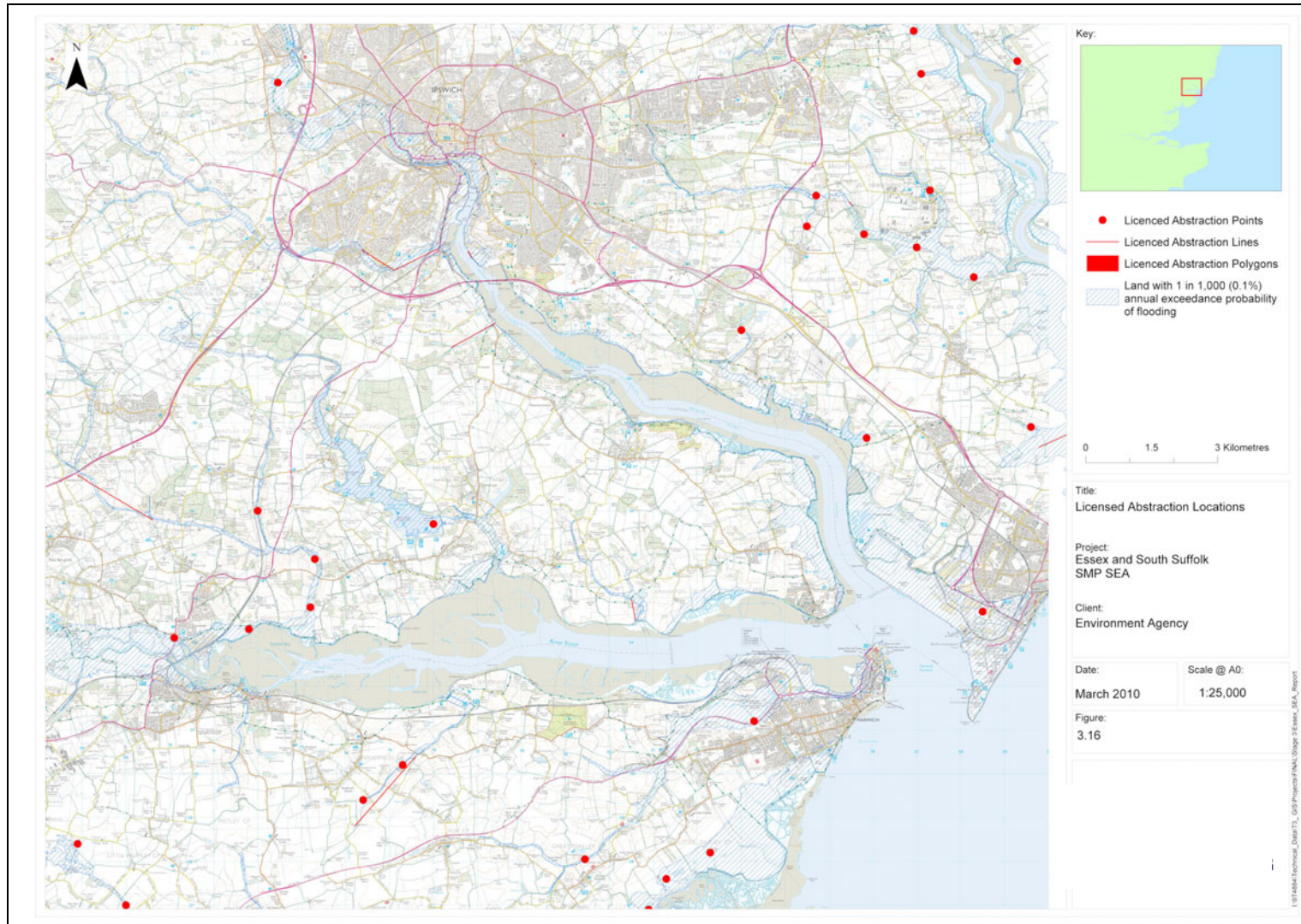


Figure 3.17 Licensed Abstraction locations on the Essex and south Suffolk coastline (Section 2)

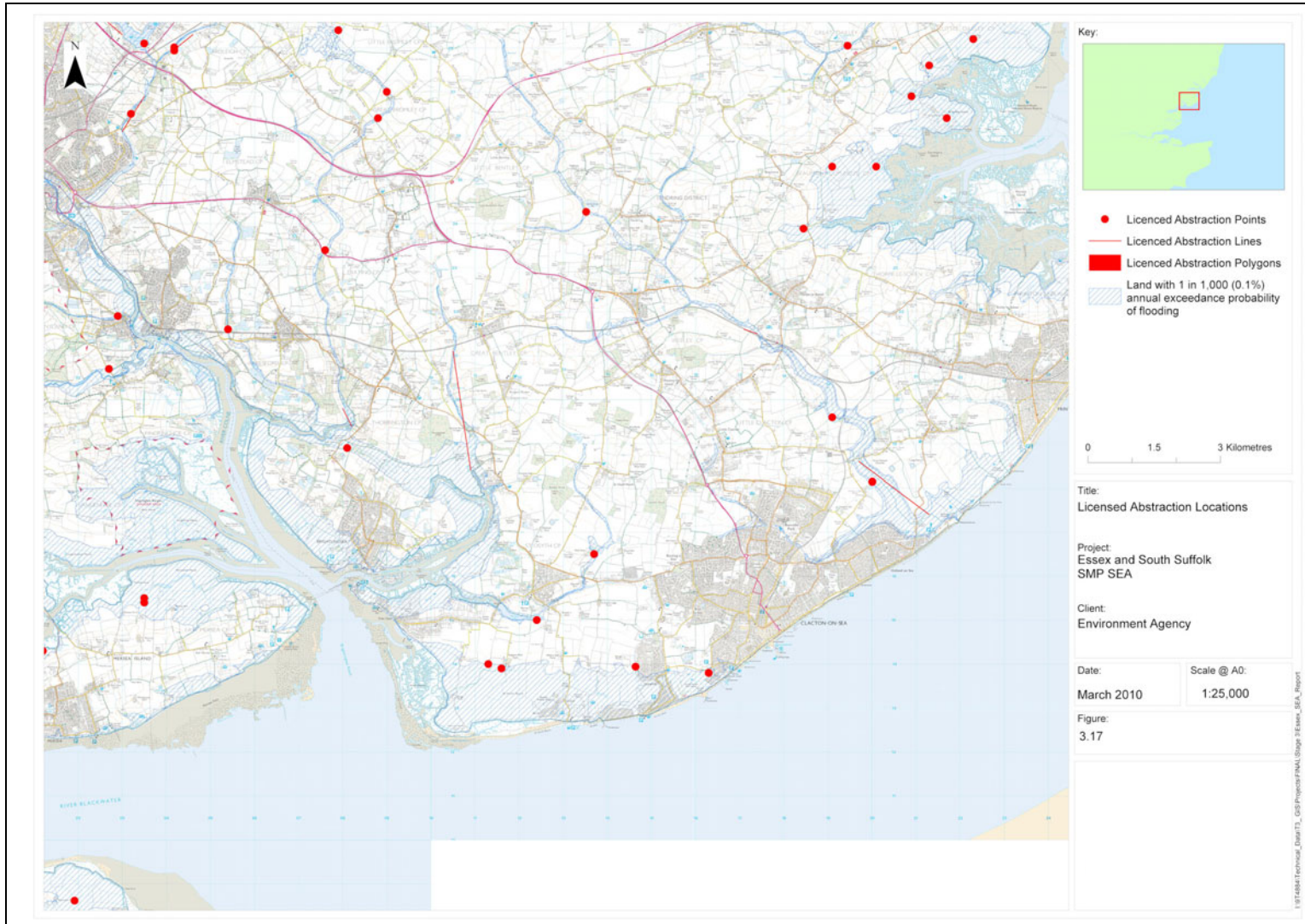


Figure 3.18 Licensed Abstraction locations on the Essex and south Suffolk coastline (Section 3)

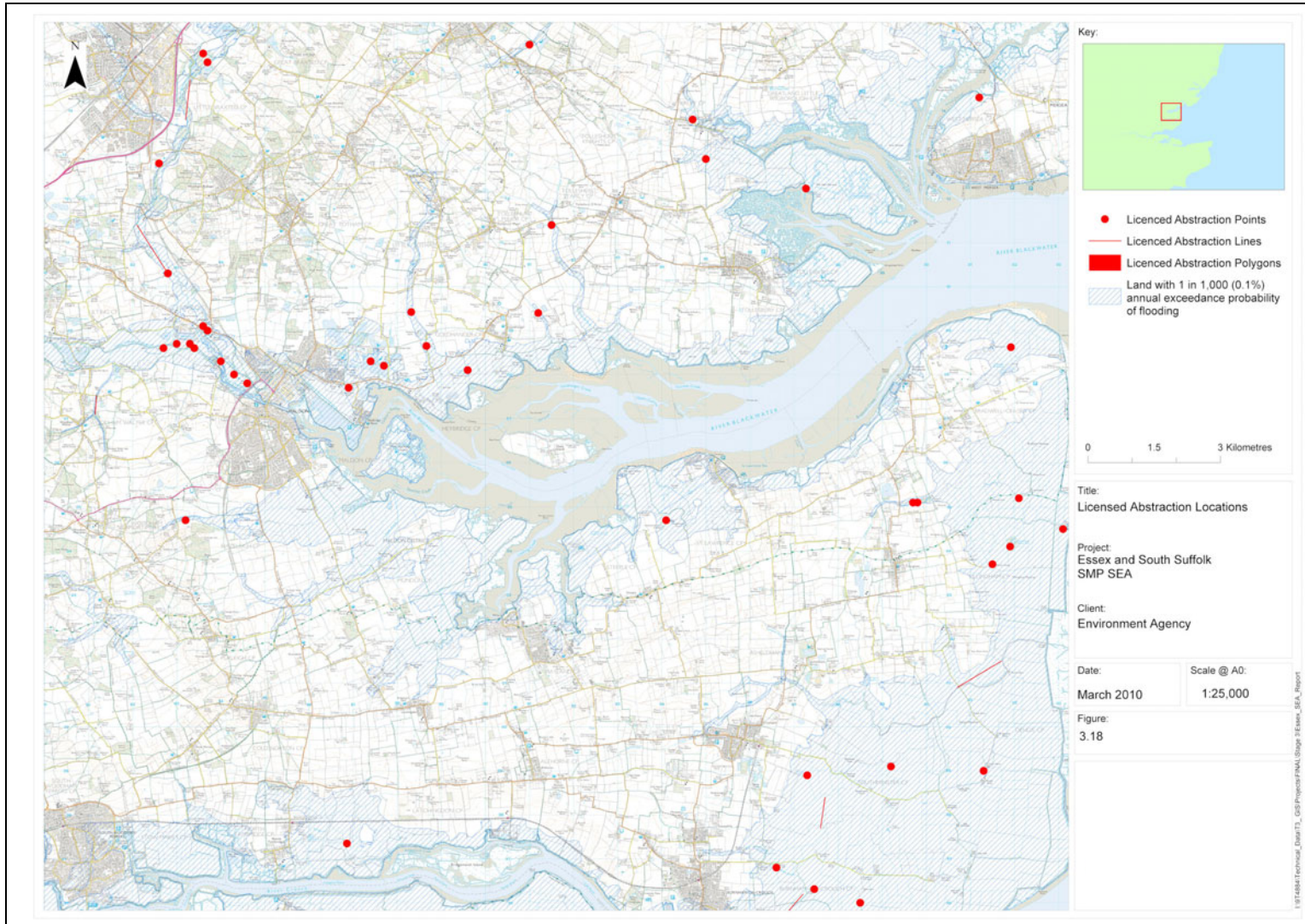
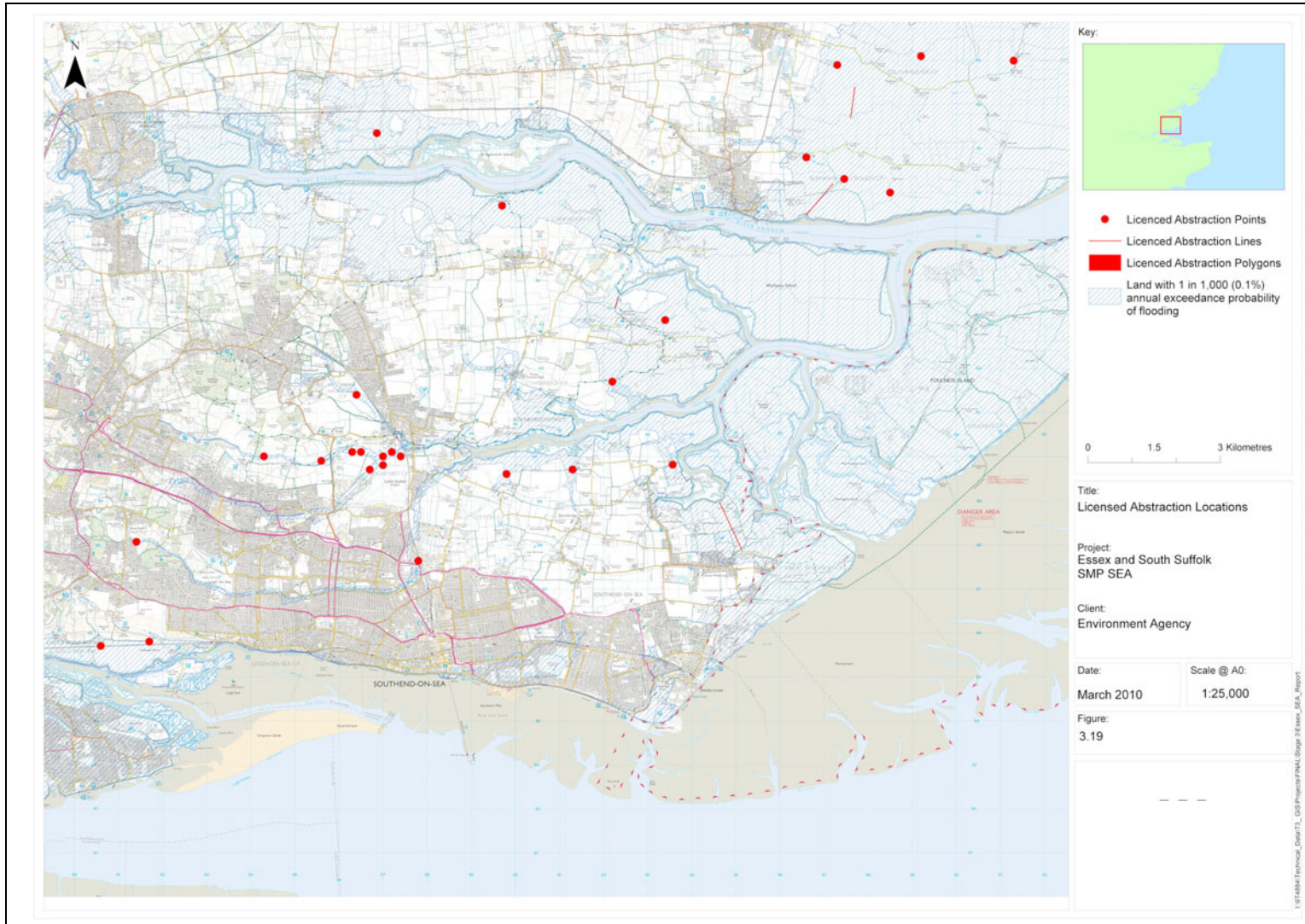


Figure 3.19 Licensed Abstraction locations on the Essex and south Suffolk coastline (Section 4)



## **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/policies. 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 (26<sup>th</sup> 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
<b>ISSUE - Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types</b>										
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	-
<b>ISSUE - Maintenance of environmental conditions to support biodiversity and the quality of life</b>										
The need to ensure that water quality is not adversely affected as a result of SMP policy.	-	+	-	+	+	+	0	0	-	0
<b>ISSUE - Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries</b>										
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	+	-	-
<b>ISSUE - Maintenance of water supply in the coastal zone</b>										
Will SMP policy adversely affect abstraction infrastructure?	0	0	0	0	0	0	0	0	0	0
<b>ISSUE - Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast</b>										
Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	+	+	+	+	+	+	+	+	0	+
<b>ISSUE - Potential loss of historic and archaeological features on a dynamic coastline</b>										
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
<b>ISSUE - Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce</b>										
<i>Protection of coastal towns and settlements</i>										
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	+	+	+	+	+	+	+
<i>Protection of key coastal infrastructure</i>										
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.						+				
<b>The need to maintain a balance of providing navigation and access to estuary communities</b>										
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 18<sup>th</sup> 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
<b>Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types</b>				
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 ( <i>Zostera marina</i> ) 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.
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>				
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	<p><i>Orwell</i> 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.</p> <p>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.</p> <p><i>Stour</i> 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.</p> <p>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.</p> <p>Overall the effect is minor negative.</p>
<b>Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries</b>				
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.
<b>Maintenance of water supply in the coastal zone</b>				
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.  Change of salinity in the freshwater aquifer attributable to SMP policy.	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.
<b>Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast</b>				
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.
<b>Potential loss of historic and archaeological features on a dynamic coastline</b>				
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.
<b>Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce</b>				
<i>Protection of coastal towns and settlements</i>				
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?	<p>Maintenance of key coastal communities.</p> <p>Provision of appropriate standard of protection for key coastal communities.</p> <p>Number of new developments located in unsustainable coastal locations.</p>	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.
<i>Protection of key coastal infrastructure</i>				
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.